Enhancing Protections for Hawaiian Spinner Dolphins To Prevent Disturbance Final Environmental Impact Statement and Regulatory Impact Review

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Abstract: The National Marine Fisheries Service is proposing to adopt regulations to enhance protections for Hawaiian spinner dolphins from various forms of take from human activities that cause harassment or disturbance and reduce the impact of viewing and interaction on these animals. This action is being undertaken pursuant to the Marine Mammal Protection Act (MMPA), 16 U.S.C. 1361 *et seq*., and its implementing regulations. Alternatives to the proposed action and potential environmental impacts are discussed in this Final Environmental Impact Statement (FEIS). The alternatives, or the actions considered as part of the alternatives, are not expected to have measurable negative impacts on spinner dolphin populations, but may have socio-economic impacts on commercial tour operators operating in certain geographic locations. The actions considered are not expected to result in irreversible or irretrievable commitments of resources.

This FEIS is a stand-alone document and does not supplement an earlier National Environmental Policy Act document.

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Executive Summary

The National Marine Fisheries Service (NMFS) is proposing to adopt regulations to reduce the threat of take to Hawaiian spinner dolphins, including harassment and disturbance caused by dolphin-directed activities that are concentrated in coastal waters (within 2 nautical miles (nm) (3.7 kilometers (km) of shore) and in designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe), and to reduce the impact of viewing and interaction on resident stocks. This action is being undertaken pursuant to the Marine Mammal Protection Act (MMPA), 16 U.S.C. 1361 *et seq*., and its implementing regulations. These regulations are necessary to address chronic interaction and viewing impacts on Hawaiian spinner dolphins. Proposed regulatory measures would help prevent take from occurring, including harassment and disturbance, and would include approach regulations (for persons and vessels) for Hawaiian spinner dolphins in marine areas where viewing pressures are most prevalent, including 2 nm (3.7 km) of the Hawaiian Islands and the waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe.

Based on increased impacts to spinner dolphins, and after considering additional public comments from the August 24, 2016, proposed rule questioning the effectiveness of the swim-with and approach regulations alone, and information highlighting the importance of time-area closures for protecting Hawaiian spinner dolphins, NOAA Fisheries believes that time-area closures are needed in conjunction with the approach regulations to reduce take of spinner dolphins in high intensity viewing areas. Proposed time-area closures and approach regulations would help ensure public compliance by providing clear notice of prohibited conduct that results in take, including harassment and disturbance. With this FEIS, NMFS is proposing a 50-yard no approach and swim-with regulations. Although we had previously asked for public comment on the possibility of implementing time-area closures, they were not part of the initial proposed rule. Therefore, under separate rulemaking, NMFS intends to propose time-area closures during designated daytime periods in certain bays on the Big Island and Maui as presented in the FEIS under Alternative 4. NOAA Fisheries will be seeking public comment on this proposed rule. In the event a proposed rule for time area closures would be adopted and finalized, NOAA Fisheries would revisit the analysis in this FEIS to determine whether any modifications or supplementation might be required.

NMFS has prepared this Final Environmental Impact Statement (FEIS) in accordance with the National Environmental Policy Act (NEPA). The document considers the environmental consequences of alternative actions to enhance protections for Hawaiian spinner dolphins from forms of "take" when spinner dolphins are engaged in important daytime fitness-enhancing behaviors. Under the MMPA, it is unlawful for any person, vessel, or other conveyance to "take" any marine mammal in waters under the jurisdiction of the United States (16 U.S.C. 1372). The term "take" means to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal (16 U.S.C. 1362). Thus the prohibition against take of marine mammals includes acts that "harass" the marine mammal (16 U.S.C. 1362(13)). Harassment means any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal in the wild or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [16 U.S.C. 1362 (18)(a); see also 50 C.F.R. 216.3 (Level A and B Harassment)]. NMFS' regulations implementing the MMPA further describe the term "take" to

include “the negligent or intentional operation of an aircraft or vessel, or the doing of any other negligent or intentional act which results in disturbing or molesting a marine mammal” (50 CFR 216.3) (hereinafter referred to as “disturbance”).

To reduce take resulting from human activities, NMFS is proposing to adopt regulations implementing Alternative 3A to prevent people and vessels (including motorized, non-motorized, and self-propelled vessels) from swimming with and approaching within 50 yards (approximately 46 meters (m)) of Hawaiian spinner dolphins within 2 nautical miles (nm) (3.7 kilometers (km)) of each of the main Hawaiian Islands (MHI) and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe. The analysis of alternatives and consequences in the DEIS has informed NMFS’ decisions on actions taken under the MMPA to reduce the take of Hawaiian spinner dolphins and to prevent long-term adverse impacts to resident spinner dolphin populations in Hawaiʻi as a result of viewing and interaction.

In 2010, NMFS recognized five island-associated stocks and one pelagic (open sea) stock of Hawaiian spinner dolphins, and identified genetic distinctions and unique geographic residency patterns as a reason to separately manage the stocks located throughout the Hawaiian Islands (Carretta *et al*. 2011). Three of the five island-associated stocks (Kauaʻi/Niʻihau stock, Oʻahu/Maui County stock, and the Hawaiʻi Island stock) are found near the main Hawaiian Islands (MHI) and thus considered resident stocks. These three stocks reside in waters surrounding their namesake island(s) out to approximately 10 nm (18.5 km) (Hill *et al*. 2010) and, although none of the stocks are depleted or strategic, population estimates for each stock are small. Island-associated spinner dolphins, such as the three stocks in the MHI, have adapted complex social structures and behavioral patterns linked to specific habitats that support their high energetic demands. People often characterize the daily pattern of spinner dolphins as “working the night shift” because the energetically demanding task of foraging is accomplished nightly when spinner dolphins move offshore in large groups to feed. During the day, spinner dolphins routinely return to areas closer to shore to socialize, nurture their young, and rest in preparation for nightly foraging. Throughout the day, these dolphin groups visit specific habitats that are located along the coastlines of the MHI. NMFS refers to these areas as “essential daytime habitats” because the areas offer physical characteristics, such as close proximity to foraging areas and sand bottom habitat, which support spinner dolphin ecology by decreasing the travel distance necessary for nightly foraging bouts and increasing the dolphins’ ability to visually detect predators during daytime resting behaviors. The spinner dolphins’ regular and predictable use of essential daytime habitats in near-shore locations makes these dolphins easily accessible to people seeking wildlife viewing and interaction opportunities, and some essential daytime habitats have become targets for spinner dolphin-directed activities.

In 2001, the International Fund for Animal Welfare (IFAW) reported an emerging dolphin-watching industry in Hawaiʻi as whale-watch operators looked for a year-round tour option (O’Connor *et al*. 2009). In 2017, it was estimated that there were 100 tour operators providing tours that enable direct interactions with spinner dolphins in the MHI, such as swim-with tours, (Impact Assessment Inc. 2018). In addition to commercial tour operations, visitors, local residents, and participants in dolphin-associated retreats may also independently access Hawaiian spinner dolphin populations from shore by swimming, kayaking, paddle boarding, or using other watercraft. Viewing marine mammals in their natural habitat can be an educational

and enriching experience if conducted safely and responsibly from a distance. However, within Hawai‘i’s near-shore waters and especially within essential daytime habitats, spinner dolphin-directed activities, such as those that closely approach, swim-with, pursue, interact, or attempt to interact with the dolphins, have the potential to disturb the dolphins by disrupting daytime behaviors. Response to disturbance varies among individuals, but diverts time and energy from fitness-enhancing activities and may, over time, result in negative impacts to the fitness of individuals and/or resident populations. For example, lack of consistent, undisturbed resting periods can reduce the amount of energy available for a spinner dolphin to engage effectively in foraging activities at night. Over time, this can result in overall poor body condition, which reduces the dolphin’s ability to fight off disease, successfully reproduce, protect itself from predators, or successfully rear its young.

Scientific literature documents disturbance to individual spinner dolphins by swimmers and vessels (Forest 2001; Courbis and Timmel 2009), as well as changes in spinner dolphin groups’ behavioral patterns in essential daytime habitats over time (Courbis 2004, 2007; Timmel *et al*. 2008; Östman-Lind 2007; Danil *et al*. 2005; Forest 2001). Dolphin-directed activities concentrate daily viewing and interaction pressures by following the MHI resident spinner dolphins’ predictable patterns of distribution and daytime behaviors. In other small cetacean populations studied at various places around the world, chronic disturbance to normal behavior patterns has been linked to biologically significant impacts, such as habitat abandonment and reduced female reproductive success (Bejder 2005, Bejder *et al*. 2006a, 2006b; Lusseau and Bejder 2007).

Currently, long-term Hawaiian spinner dolphin residency and population monitoring data is insufficient to clearly identify whether individual dolphins are already showing long-term fitness impacts from disturbances within essential daytime habitats. However, short-term changes in behavior and habitat use that is documented in the scientific literature indicate that population-level effects may already be occurring. NMFS is particularly concerned given that these are small, closed or isolated populations, where disturbance effects may be amplified (Bejder 2005), indicating a need for more effective management under the MMPA.

Although unpermitted take of marine mammals, including spinner dolphins, is illegal wherever it occurs, NMFS is proposing these regulations to manage the threat of take to Hawaiian spinner dolphins, including harassment and disturbance caused by dolphin-directed activities that are concentrated in coastal waters (within 2nm of shore and in designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe), and to reduce the impact of increased viewing and interaction on resident stocks. NMFS does not expect that these same impacts are prevalent in the outer portions of the resident stocks’ range because the dolphins are not easily accessed when they are offshore during the evening hours while engaged in foraging behaviors. Therefore, in the alternatives listed below, NMFS proposed enhancing protections within 2 nm from shore of each of the MHI and including the designated waters bounded by the islands of Lāna‘i, Maui, and Kaho‘olawe. NMFS developed the proposed action and alternative actions analyzed in this FEIS to address concerns for spinner dolphins, and the potential impacts of each alternative on the human environment are discussed in this document. The following is a summary of each of the alternatives and their potential impacts.

Alternative 1 – No Action

Under NEPA, NMFS must describe the No Action Alternative to provide a baseline with which to compare the impacts of each action alternative, and to disclose the potential impacts of making no changes to the current management strategy. Under the no action alternative, NMFS would not implement any additional measures to protect Hawaiian spinner dolphins from the effects of disturbance caused by dolphin-directed activities. The current MMPA take regulations would continue to provide legal protection for these animals. Although education and outreach efforts, such as the Dolphin SMART program, would continue under this alternative, spinner dolphins are expected to continue to experience regular and increased disturbance in Hawai‘i’s waters and especially within essential daytime habitats because of documented close approaches by vessels and swimmers. This disturbance is likely to affect habitat use and/or energetic costs for individual spinner dolphins. Over time, the levels of disturbance may result in habitat abandonment and/or declines in spinner dolphin fitness.

Under Alternative 1, local communities adjacent to essential daytime habitats that are targeted by people interacting with Hawaiian spinner dolphins are expected to continue to see negative impacts to their community structure, and social and cultural resources. Over time, if habitat abandonment or declines in local spinner dolphin populations develop, businesses that depend upon spinner dolphin-based tourism will find it difficult to continue to profit, as competition may increase and spinner dolphin groups may be displaced further from harbors, becoming more difficult to locate.

Alternative 2 – Swim-With Regulation

Under Alternative 2, NMFS would prohibit swimming with Hawaiian spinner dolphins, including attempting to swim towards spinner dolphins. Swimmers who inadvertently find themselves within 50 yards (approximately 46 m) of a spinner dolphin, or swimmers approached by spinner dolphins, must make no effort to engage or pursue the animals and must take immediate action to move away from the animals. This rule is applicable within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe. Compared with the No Action Alternative, Alternative 2 is expected to decrease the number of disturbances that spinner dolphins experience in Hawai‘i’s waters from swimmers closely approaching the dolphins. However, spinner dolphins may still be at risk of chronic disturbance in Hawai‘i’s waters, and especially within essential daytime habitats, because close approaches by vessels or watercraft are not prohibited, and this alternative provides limited protection from the intensity of spinner dolphin-directed behavior in essential daytime habitats targeted by people interacting with spinner dolphins.

Alternative 2 may reduce the impacts of shore-based swimmers on some local communities currently affected by Hawaiian spinner dolphin-directed activities (see Alternative 1), because swimmers may choose not to engage in spinner dolphin-directed activities in those bays. Still, some shore-based swimmers may choose to engage in dolphin-directed activities in a different way in the same areas. The degree to which impacts on local communities are reduced will vary based on the prevailing spinner dolphin-directed activities in the bay. For example, bays where shore swimming is common may experience relief from this alternative; however, use of other

platforms, such as kayaks and stand-up paddleboards (SUPs), may increase in frequency, which may negate any relief provided by this alternative.

For businesses that specifically offer swim-with-dolphin tours, eliminating the option to swim with Hawaiian spinner dolphins may result in a reduction in revenue; however, other activities could be substituted to offset these potential losses as more fully discussed in section 4.4. Scuba, SUP, and other businesses that do not offer spinner dolphin-directed activities would be less affected, although they would still not be able to swim with the dolphins if they encountered them while engaging in their activity.

Alternative 3 – Swim-With and Approach Regulations

Under Alternative 3, NMFS would prohibit swimming with and approaching Hawaiian spinner dolphins within a specified minimum distance; two distance options are evaluated in this document under Alternative 3(A) and Alternative 3(B) below. These alternatives would be applicable within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe.

Alternative 3(A) – Swim-With and 50 Yard Approach Regulations

Under Alternative 3(A), NMFS would prohibit swimming with and approaching a Hawaiian spinner dolphin within 50 yards (approximately 46 m) by any means. The prohibitions apply to all forms of swimming-with and approach in water and air. Forms of approaching spinner dolphins include, but are not limited to, swimming, operating a manned or unmanned motorized, non-motorized, self-propelled, human-powered, or submersible vessel; operating an unmanned aircraft system (UAS) or drone; and swimming at the water surface or underwater (*i.e.*, SCUBA or free diving). This also includes approach by interception; in other words, placing a vessel or person in the path of an oncoming spinner dolphin so that the dolphin surfaces within 50 yards of the vessel or person (also known as leap frogging). This alternative is consistent with Dolphin SMART program criteria and NMFS guidelines, which advise boaters to stay 50 yards away from marine mammals to prevent disturbance.

This alternative prevents a range of human activities that occur in close proximity to Hawaiian spinner dolphins including swimming with, touching or attempting to touch, corralling or herding into small areas, enticing or attempting to entice a spinner dolphin to approach a human within 50 yards by offering an object of interest to the dolphin, and leap frogging, all of which have the potential to disturb spinner dolphins.

The following exceptions are provided for this prohibition: (1) any person who inadvertently comes within 50 yards of a Hawaiian spinner dolphin or is approached by a spinner dolphin, provided the person makes no effort to engage or pursue the animal and takes immediate steps to move away from the animal; (2) any vessel that is underway and is approached by a spinner dolphin, provided the vessel continues normal navigation and makes no effort to engage or pursue the animal. For purposes of this exception, a vessel is underway unless it is made fast to the shore, at anchor, or aground; (3) any vessel that is anchored or aground and approached by spinner dolphins, provided they do not make any effort to engage or pursue the animal(s); (4)

any vessel transiting to or from a port, harbor, or in a restricted channel when a 50 yard distance will not allow the vessel to maintain safe navigation; (5) vessel operations necessary to avoid an imminent and serious threat to a person or vessel; (6) activities authorized through a permit or authorization issued by the NMFS to take spinner dolphins; (7) Federal, State, or local government vessels, aircraft, personnel, and assets when necessary in the course of performing official duties; and (8) Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

Compared with the No Action Alternative, Alternative 3(A) is expected to decrease the number of disturbance events that Hawaiian spinner dolphins experience in Hawai‘i’s waters due to vessels or persons closely approaching spinner dolphins. NMFS anticipates that the decrease in disturbance will benefit spinner dolphin health and fitness and provide greater benefits than Alternatives 2 or the No-Action Alternative. The intensity of spinner dolphin-directed activities may still remain high in essential daytime habitats targeted by people interacting with the dolphins, and this alternative may not fully address disturbance problems in bays where resting behaviors consist of spinner dolphins moving back and forth across the resting area because approach may be difficult to enforce in these areas.

Under Alternative 3(A), shore-based swimmers will not have the option to seek close viewing opportunities through other platforms and will be limited to viewing Hawaiian spinner dolphins from a 50 yard minimum distance. Similar to Alternative 2, NMFS expects this alternative to reduce the impacts on local communities from Hawaiian spinner dolphin-directed activities, but the degree to which they may be affected may vary. Alternative 3(A) may also impact some human activities that are not spinner dolphin-directed because this alternative prohibits all types of vessels from approaching spinner dolphins within 50 yards.

Implementing this alternative would necessitate operators that currently offer the opportunity to swim with Hawaiian spinner dolphins to cease this activity, although they may choose to continue to provide other services such as dolphin watching to their clientele provided that it is done at more than 50 yards away from the dolphins. It is difficult to determine if these distance restrictions will negatively influence ticket sales for dolphin viewing tours, because viewing opportunities will still exist at 50 yards or greater. Some tour operators may be able to offer alternative recreational opportunities as part of a tour to help offset the potential loss in demand for tours. Generalized commercial tour boat operators may still view the dolphins from the minimum prescribed distance, and because these tour boat operators are taking passengers to enjoy being out on the water and for general wildlife viewing rather than having the specific goal of viewing spinner dolphins, the economic impact to this group of tour operators is likely to be minimal.

Alternative 3(B) – Swim-With and 100 Yard Approach Regulations

Under Alternative 3(B), NMFS would prohibit swimming with and approaching a Hawaiian spinner dolphin within 100 yards (approximately 92 m) by any means. The prohibitions apply to all forms of swimming-with and approach in water and air. Forms of approaching spinner dolphins include, but are not limited to, swimming, operating a manned or unmanned motorized,

non-motorized, self-propelled, human-powered, or submersible vessel; operating an unmanned aircraft system (UAS) or drone; and swimming at the water surface or underwater (*i.e.*, SCUBA or free diving). This also includes approach by interception; in other words, placing a vessel or person in the path of an oncoming spinner dolphin so that the dolphin surfaces within 100 yards of the vessel or person (also known as leap frogging).

Similar to Alternative 3(A), this Alternative would prevent the same range of human activities that occur in close proximity to Hawaiian spinner dolphins discussed above. However, the increased distance is expected to provide spinner dolphins more protections from disturbance.

The following exceptions are provided for this prohibition (matching those provided for Alternative 3(A)): (1) any person who inadvertently comes within 50 yards of a Hawaiian spinner dolphin or is approached by a spinner dolphin, provided the person makes no effort to engage or pursue the animal and takes immediate steps to move away from the animal; (2) any vessel that is underway and is approached by a spinner dolphin, provided the vessel continues normal navigation and makes no effort to engage or pursue the animal; (3) any vessel that is anchored or aground and approached by spinner dolphins, provided they do not make any effort to engage or pursue the animal(s); (4) any vessel transiting to or from a port, harbor, or in a restricted channel when a 50 yard distance will not allow the vessel to maintain safe navigation; (5) vessel operations necessary to avoid an imminent and serious threat to a person or vessel; (6) activities authorized through a permit or authorization issued by the NMFS to take spinner dolphins; (7) Federal, State, or local government vessels, aircraft, personnel, and assets when necessary in the course of performing official duties; and (8) Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

Compared with the No Action Alternative and Alternative 2, Alternative 3(B) is expected to decrease the number of disturbance events that spinner dolphins experience in Hawai‘i’s waters due to vessels or persons closely approaching a group of Hawaiian spinner dolphins, and is expected to provide more protection from disturbance than Alternative 3(A) because harassment can occur from activities that occur at distances greater than 50 yards. NMFS anticipates the decrease in disturbance will benefit spinner dolphin health and fitness. The intensity of spinner dolphin-directed activities may still remain high in essential daytime habitats targeted by people interacting with the dolphins, and approach regulations may not fully address disturbance problems in bays where resting behaviors consist of spinner dolphins moving back and forth across the resting area because approach may be difficult to enforce in these areas.

Under Alternative 3(B), shore-based swimmers will not have the option to seek close viewing opportunities through other platforms and will be limited to viewing Hawaiian spinner dolphins from a 100 yard minimum distance. Similar to Alternative 2, NMFS expects this alternative to reduce the impacts on local communities from Hawaiian spinner dolphin-directed activities, but the degree to which they may be affected may vary. Alternative 3(B) may also impact some human activities that are not spinner dolphin-directed because this alternative prohibits all types of vessels from approaching spinner dolphins within 100 yards.

Implementing this alternative would necessitate operators that currently offer the opportunity to swim with Hawaiian spinner dolphins to cease this activity, although they may choose to continue to provide other services, including dolphin watching, to their clientele, provided that it is done at more than 100 yards away from the dolphins. It is difficult to determine if these distance restrictions will negatively influence ticket sales for dolphin viewing tours because viewing opportunities will still exist at 100 yards or greater. Some tour operators may be able to offer alternative recreational opportunities as part of a tour to help offset the potential loss in demand for tours.

Alternative 4 – Mandatory Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 4 would prohibit people from using five mandatory time-area closures (*i.e.*, closures that are required by law) during specific resting times and prohibit swimming with and approaching Hawaiian spinner dolphins within a minimum prescribed distance. Under Alternative 4, the proposed action would create the following two components within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe:

1. **Mandatory time-area closure component:** Implement mandatory time-area closures in five selected essential daytime habitats. NMFS would prohibit human and vessel entry, subject to specified exceptions, in a small subset of Hawaiian spinner dolphin essential daytime habitats every day from 6 AM to 3 PM. The areas chosen for mandatory time-area closures are Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay (Hoʻokena), and Makako Bay on the Island of Hawaiʻi; and La Perouse Bay on the Island of Maui.
2. **Swim with and approach regulations component:** Implement swim-with and minimum distance approach regulations. NMFS would prohibit swimming with or approaching Hawaiian spinner dolphins within a minimum prescribed distance (between 50 and 100 yards). Similar to Alternatives 3(A) and 3(B), a minimum approach regulation would prevent a range of human activities that occur in close proximity to spinner dolphins that result in take.

The areas considered for this alternative are five essential daytime habitats that have been identified as having high levels of human disturbance and which meet the criteria established in the selection process outlined in section 2.7 and Appendix A of this document. To reduce the likelihood of impacts to human activities that are not Hawaiian spinner dolphin-directed and are not likely to result in harassment, closure areas were carefully delineated to include the areas where the dolphins rest, and when possible, to exclude areas used for other activities. At all locations, activities occurring in the intertidal zone, such as shore-based fishing and subsistence gathering, would not be affected during any time of day. In addition, all ocean-based recreational, fishing, subsistence gathering, and/or cultural activities would continue in those parts of the bays that are not designated as mandatory closure zones (subject to existing State regulations).

All exceptions for the approach regulations described above for Alternatives 3(A) and 3(B) would apply to these regulations and as appropriate to the time-area closures, because they do

not occur at an intensity or frequency that is likely to harass Hawaiian spinner dolphins. In addition the following exceptions would also apply to the time-area closure prohibitions: (1) vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure, (2) vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure, and (3) outrigger canoes used for traditional subsistence fishing with harvested resources intended for personal, family, or community consumption or traditional use.

Under Alternative 4, the reduction in behavioral disturbance to spinner dolphins from the approach regulations and the creation of time-area closures provides dolphins with more time and space to engage in fitness-enhancing behaviors, which is likely to increase the fitness of individual spinner dolphins and the population as a whole. Enhanced protection associated with this alternative is expected to prevent long-term impacts to the resident stocks.

Faced with the swimming with and approach prohibitions and mandatory closures under Alternative 4, shore-based swimmers may choose to participate in different recreational activities (similar to Alternative 2), or view the dolphins from the minimum prescribed distance outside of the time-area closures. Additional impacts to human activity include the loss of access to the closed areas during the closed times by other ocean users, such as snorkelers, divers, kayakers, canoe paddlers, and/or cultural practitioners, as well as subsistence and recreational fishers. To minimize impacts to human activities that are not Hawaiian spinner dolphin-directed, closure areas were carefully delineated to include the areas where spinner dolphins rest and, when possible, to exclude areas used by humans for specific, non-dolphin-directed activities.

This alternative would prohibit all commercial swim-with-wild-dolphin activity through the prohibition on approaching within the minimum prescribed distance of Hawaiian spinner dolphins. Although spinner dolphins may still approach swimmers and snorkelers who enter the water, these swimmers may not engage with the dolphins and would need to reopen the space between themselves and the dolphins. Therefore, implementing this alternative would lead to operators that currently offer the opportunity to swim with spinner dolphins to cease this activity, although they may choose to continue to provide other services, such as dolphin watching from a lawful distance, among their menu of options to their clientele.

Impacts to the tour industry under this alternative are expected to be largely similar to those described for Alternatives 3(A) and 3(B) for most of the MHI where only approach regulations would apply; however, time-area closures are expected to affect tour operators differently in areas surrounding the closures. Dolphin-viewing tour operators using these areas may choose to view dolphins from outside the closures or experience increased costs to travel to alternative sites (without closures) to allow more flexibility in viewing the dolphins from the prescribed approach distance. Similarly, generalized commercial boat tour operators may continue to use areas outside of the closures for their tours or may choose alternative locations that set fewer restrictions on boat operators. Those individuals or companies that conduct kayak tours or other non-motorized vessel tours in or near time-area closures may see a slight reduction in revenues relative to their dependence on dolphin-directed customers. Additionally, due to the closed areas, these tour companies may choose to offer alternative tour locations that set fewer restrictions on kayakers.

The loss in overall revenue to the swim-with-wild-dolphins operators is uncertain. Within the time-area closures, the economic impact on generalized commercial tour boat operators is likely to be minimal while non-motorized vessel tour operators may see a slight reduction in revenues, and there should be little to no impact on these operators outside of the time-area closures.

The cultural impacts within the five time-area closures may include limited access to some traditional fishing areas. Traditional fishing activities do not occur at an intensity or frequency that may be expected to disrupt spinner dolphins. Accordingly, the closures described in, the closures were designed to allow for continued shoreline access for gathering of resources such as limu, opihi, and paakai, and exceptions are allowed for transiting through the closures for the purposes of subsistence fishing and canoe paddling.

Alternative 5 – Voluntary Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 5 would create five voluntary time-area closures (*i.e.*, closures that are required by law) and prohibit swimming with and approaching Hawaiian spinner dolphins within a minimum prescribed distance. Under Alternative 5, the proposed action would create the following two components within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe:

1. **Voluntary time-are closure component:** Implement voluntary time-area closures in five selected essential daytime habitats. NMFS would close a small subset of Hawaiian spinner dolphin essential daytime habitats every day from 6 AM to 3 PM. The areas chosen for mandatory time-area closures are Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay (Hoʻokena), and Makako Bay on the Island of Hawaiʻi; and La Perouse Bay on the Island of Maui. When a voluntary closure is effective, persons and vessels have a moral but not legal responsibility to comply with its terms. A violation does not result in sanctions.
2. **Swim-with and approach regulations component:** Implement a no swimming with and minimum distance approach rule. NMFS would prohibit swimming with or approaching Hawaiian spinner dolphins within a minimum prescribed distance (between 50 and 100 yards). Similar to Alternatives 3(A) and 3(B), a minimum approach regulation would prevent a range of human activities that occur in close proximity to spinner dolphins that result in take.

The areas considered for this alternative are the same five essential daytime habitats that have been identified as having high levels of human disturbance described for Alternative 4 above and which meet the criteria established in the selection process outlined in section 2.7 and Appendix A of this document. To reduce the likelihood of impacts to human activities that are not Hawaiian spinner dolphin-directed, closure areas were carefully delineated to include the areas where the dolphins rest, and when possible, to exclude areas used for other activities. At all locations, intertidal zones are not part of the closures, and activities such as shore-based fishing and subsistence gathering are not affected during any time of day. All ocean-based recreational, fishing, subsistence gathering, and/or cultural activities would be requested to carry out activities

in those parts of the bays that are not designated as voluntary closure zones (subject to existing State regulations) to support Hawaiian spinner dolphin protections. All exceptions for the approach regulations described above for Alternatives 3(A) and 3(B) would apply to these regulations and as appropriate to the time-area closures. The additional three transit exceptions described for the time-area closures in Alternative 4 (above) would not be subject to the voluntary closures as well.

Alternative 5 would provide a set of protections to address ongoing activities that cause disturbance in close proximity to spinner dolphins by setting minimum approach distances (described by Alternative 3). NMFS anticipates the decrease in disturbance to benefit spinner dolphin health and fitness similar to Alternative 3. NMFS does not anticipate that participation will be high for voluntary time-area closures, because resource users' motivations and beliefs vary widely within the five closure areas and voluntary compliance measures have had limited success in the past. Therefore, the intensity of spinner dolphin-directed activities may still remain high in essential daytime habitats with voluntary time-area closures in place, and spinner dolphins may receive no additional benefit.

Faced with the swimming with and approach prohibitions and voluntary closures under Alternative 5, shore-based swimmers may choose to participate in different recreational activities (similar to Alternative 2), or view the dolphins from the minimum prescribed distance. Participation in the voluntary closures will limit ocean-use activities (*e.g.*, snorkelers, divers, kayakers, canoe paddlers, and/or cultural practitioners, as well as subsistence and recreational fishers) to areas outside of the closures during closed periods. To minimize impacts to human activities that are not Hawaiian spinner dolphin-directed, closure areas were carefully delineated to include the areas where spinner dolphins rest and, when possible, to exclude areas used by humans for specific, non-dolphin-directed activities.

This alternative would eliminate all commercial swim-with-wild-dolphin activity through the prohibition on approaching within the minimum prescribed distance of Hawaiian spinner dolphins. Therefore, implementing this alternative would lead to operators that currently offer the opportunity to swim with spinner dolphins to cease this activity, although they may choose to continue to provide other services, such as dolphin watching, among their menu of options to their clientele.

Impacts to the tour industry under this alternative are expected to be largely similar to those described for Alternatives 3(A) and 3(B) for most of the MHI where only approach regulations would apply. Impacts of the time-area closures will be localized to areas surrounding the five closures and effects on tour operators may vary, depending on their willingness to comply with the closure requests and whether they choose to alter their operations in response. Accordingly, effects for tour operators in areas surrounding the closure may range from the effects described by the approach regulations under Alternative 3 (if they do not participate) and the effects described by Alternative 4 (if they do participate).

Alternatives		Time in Effect	Area in effect	Prohibitions or Restrictions
1	**No Action**	24 hours	Worldwide - Subject to the jurisdictional limits of the MMPA	Current MMPA Prohibitions*
All Alternatives below also include Current MMPA Prohibitions				
2	**Swim-With Regulation**	24 hours	All waters within 2 NM of shore and designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with Hawaiian spinner dolphins
3(A)	**Swim-With and 50 Yard Approach Regulations**	24 hours	All waters within 2 NM of shore and designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or dolphin group within 50 yards
3(B)	**Swim-With and 100 Yard Approach Regulations**	24 hours	All waters within 2 NM of shore and designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or dolphin group within 100 yards
4	**Five Mandatory Time-Area Closures and**	6 AM to 3 PM Daily	Delineated areas within five essential daytime habitats	All activities prohibited within closures from 6 AM to 3 PM
	Swim-With and Approach Regulations	24 hours	All waters within 2 NM of shore and designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or dolphin group within a prescribed distance (either 50 or 100 yards)
5	**Five Voluntary Time-Area Closures and**	6 AM to 3 PM Daily	Delineated areas within five essential daytime habitats	Request no activities within closures from 6 AM to 3 PM
	Swim-With and Approach Regulations	24 hours	All waters within 2 NM of shore and designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or dolphin group within a prescribed distance (either 50 or 100 yards)

***See section 1.3.1 Marine Mammal Protection Act: Statutory Requirements, Authorities, and Prohibitions for current MMPA prohibitions related to take.**

NMFS considered whether other management measures may be necessary and appropriate to protect Hawaiian spinner dolphins from take, especially in essential daytime habitats targeted by humans for dolphin-directed activities. Accordingly, NMFS solicited public comment on alternative management options that would promulgate both minimum approach (and thus no swim with) regulations and create either mandatory (Alternative 4; section 2.5) or voluntary (Alternative 5; section 2.6) time-area closures in five essential daytime habitats. The time-area closures in this document address the areas where human interactions with these dolphins are most problematic. NMFS recognizes that there are ongoing human interactions with spinner dolphins in other areas (see Table 1), and there is a possibility of expanding the enhanced protections to spinner dolphins in these areas if necessary and appropriate.

Exceptions

NMFS considered specific categories of exceptions that would apply to the various alternatives (see Table 4 for application of exceptions):

- Any person who inadvertently comes within 50 yards of a Hawaiian Spinner dolphin or is approached by a spinner dolphin, provided the person makes no effort to engage or pursue the animal and takes immediate steps to move away from the animal;
- Any vessel that is underway and is approached by a spinner dolphin, provided the vessel continues normal navigation and makes no effort to engage or pursue the animal;
- Vessels that are anchored or aground and approached by spinner dolphins, provided they do not make any effort to engage or pursue the animal(s);
- Any vessel transiting to or from a port, harbor or in a restricted channel when a 50 yard distance will not allow the vessel to maintain safe navigation;
- Vessel operations necessary to avoid an imminent and serious threat to a person or vessel;
- Activities authorized through a permit or authorization issued by the NMFS to take spinner dolphins; and
- Federal, State, or local government vessels, aircraft, personnel, and assets when necessary in the course of performing official duties.
- Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

In addition to the above exceptions, the following exceptions would apply to both alternatives 4 and 5:

- Vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure;
- Vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure; and
- Outrigger canoes used for traditional subsistence fishing with harvested resources intended for personal, family, or community consumption or traditional use.

Activities occurring in the intertidal zone (the area between tidemarks, or above water at low tide and under water at high tide), including shore-based fishing and subsistence gathering, are not included in the time-area closures and will continue during any time of day.

The last three exceptions are designed to accommodate the needs of local landowners and ongoing, traditional activities within the time-area closures, and are expected to have a very low level of impact to the dolphins. The exception for government vessels, aircraft, personnel, and assets operating in the course of official duty avoids disruption of ongoing government business, including enforcement activities and those critical to national security. The exception for vessels engaged in an activity authorized through a permit or other authorization issued by NMFS to take spinner dolphins — which may closely approach spinner dolphins to obtain photographs, collect samples, and observe behavior under NMFS permits — is considered necessary to carry out ongoing research and studies needed to inform management and conservation of the dolphins. Further, permit terms and conditions are expected to reduce the potential impacts to dolphins. The exception for vessels avoiding an imminent and serious threat to a person or vessel is necessary for safety of human life and property. The exception relating to vessels transiting to and from harbors and restricted channels is necessary to ensure the needs of safe navigation, and recognizes that approaching spinner dolphins within 50 yards while doing so may be unavoidable in some cases.

The burden would be on the vessel operator to prove the exception applies, and vessel operators would not be exempt from other take prohibitions under the MMPA.

Publication of the DEIS and Public Comment Period

Upon publication of the DEIS and the Notice of Availability on August 26, 2016 (81 FR 57854), a public comment period commenced that ended on October 23, 2016. However, in response to multiple requests from the public, the comment period was later extended until December 1, 2016 (81 FR 80629). Public hearings were also held at locations throughout the main Hawaiian Islands in September 2016. During the public hearings, 145 people provided recorded, oral testimony on the proposed rule. Throughout the public comment period, NMFS received a total of 22,031 written submissions via letter, e-mail, and the Federal e-rulemaking portal. Of these comments, 2,294 were unique, with anywhere from two to 17,000 near-duplicates. Additionally, NMFS received a petition submitted by Kama‘aina United to Protect the ‘Aina (KUPA) - Friends of Ho‘okena Beach Park (Kauhakō Bay), which contained over 285 names and signatures. Comments were submitted by individuals; research, conservation, and education groups; trade and industry associations; tour and retreat operators; federal, state, and local government entities; and others. NMFS posted all written comments received during the comment period on the federal e-rulemaking website (*https://www.regulations.gov/document?D=NOAA-2005-0226-0002*). These comments have been compiled and responses to the comments can be found in Appendix H.

Changes Made in the FEIS

In response to public comments received on the Draft EIS, NMFS added language to the third exception (additions in italics):

- Any vessel that is anchored *or aground* and approached by a spinner dolphin, provided they do not make any effort to engage or pursue the animal(s).

Upon review of the comments received during the public comment period, we decided to add an exception for:

- Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

NMFS also received many comments voicing concerns that the information from the Economic Data Report (Impact Assessment Inc. 2007) was outdated and did not fully capture the potential economic impact on the swim-with-dolphin tour industry of the proposed rule. We therefore decided to update the economic data with current data that was gathered in 2017 and generated a new Economic Data Report (Impact Assessment Inc. 2018). This updated information has been incorporated into and is analyzed in this FEIS.

NMFS has also determined, after analysing all the public comments and review of all available scientific information, that Alternative 3A best meets the purpose and needs of the proposed action.

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List of Acronyms

ACOE	Army Corps of Engineers
ANPR	Advance Notice of Proposed Rulemaking
CORAL	Coral Reef Alliance
FEIS	Final Environmental Impact Statement
DLNR	Department of Lands and Natural Resources
DOCARE	Division of Conservation and Resources Enforcement
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EO	Executive Order
ESA	Endangered Species Act
ETP	Eastern Tropical Pacific
FEP	Fishery Ecosystem Plan
HAPC	Habitat Areas of Particular Concern
IDCPA	International Dolphin Conservation Program Act
IFAW	International Fund for Animal Welfare
KUPA	Kamaaina United to Protect the Aina
LOA	Letter of Authorization
MHI	Main Hawaiian Islands
MLCD	Marine Life Conservation District
MMC	U.S. Marine Mammal Commission
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MUS	Management Unit Species
NELHA	Natural Energy Laboratory of Hawai‘i Authority
NEPA	National Environmental Policy Act
NHP	National Historical Park
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent to Prepare an EIS
NMFS	National Marine Fisheries Service
NWHI	Northwestern Hawaiian Islands
OLE	Office of Law Enforcement
ORMA	Ocean Recreation Management Area
OSP	Optimal Sustainable Population
PIRO	Pacific Islands Regional Office
RIR	Regulatory Impact Review
SAR	Stock Assessment Report
WHVS	West Hawai‘i Voluntary Standards

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Definition of Hawaiian Words

ahupuaʻa	land division usually extending from the mountains to the sea
ʻākia	shrubs and trees whose bark is used for fish poisoning
akua	god
akule	bigeye scad (Trachurops crumenophthalmus)
aliʻi	chief, ruler, royalty
ʻauhuhu	slender, shrubby legume used for poisoning fish
ʻaumakua	family or personal god, deified ancestor; ʻaumākua (plural)
hale mua	men's eating house
hāhālua	manta ray
hāʻukeʻuke	sea urchin
heiau	place of worship
hoe waʻa	canoe paddling
hōlua	sled course built from lava rock or on grass; or, the sled itself
hukilau	seine; to fish with the seine
kapu	taboo, prohibition
koʻa	fishing grounds; fishing shrine
iʻa	fish
iwi	bone
lāʻau lapaʻau	medicine
leina a ke akua	leaping-off points from which a departing spirit enters the next world
limu	seaweed
loko iʻa	fish pond
loko kuapā	fish pond made by building a wall on a reef
loli	sea slug or sea cucumber
makai	towards the sea
moʻi	king, ruler
moʻolelo	story
naiʻa	dolphin
ʻōʻio	bonefish (Albula vulpes)
ʻōpelu	mackerel scad (Decapterus pinnulatus and D. maruadsi)
ʻopihi	limpet (Cellana sp.)
paʻakai	salt
pāhoehoe	smooth lava
palu	bait
puʻuhonua	place of refuge
puʻuone	pond near the shore connected to the sea by a stream or ditch
waʻa	canoe
wana	sea urchin
wahi pana	storied place

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Chapter 1 – Purpose and Need for Action/Background

1.1 Purpose and Need

The National Marine Fisheries Service (NMFS) is proposing to adopt regulations to reduce the threat of take to Hawaiian spinner dolphins, including harassment and disturbance caused by dolphin-directed activities that are concentrated in coastal waters of the MHI (within 2 nautical miles (nm) (3.7 kilometers (km)) of shore and in designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe) and to reduce the impact of viewing and interaction on resident stocks. This action is being undertaken pursuant to the Marine Mammal Protection Act (MMPA), 16 U.S.C. 1361 *et seq*., and its implementing regulations. These regulations are necessary to address chronic interaction and viewing impacts on Hawaiian spinner dolphins. Proposed regulatory measures would help prevent take from occurring, including harassment and disturbance, and would include approach regulations (for persons and vessels) for Hawaiian spinner dolphins in marine areas where viewing pressures are most prevalent, including within 2 nm (3.7 km) of the Hawaiian Islands and the waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe. Proposed approach regulations would help ensure public compliance by providing clear notice of prohibited conduct that results in take, including harassment and disturbance.

Under the Marine Mammal Protection Act, it is unlawful for any person, vessel, or other conveyance to "take" any marine mammal in waters under the jurisdiction of the United States (16 U.S.C. 1372). The MMPA defines "take" (or taking) as meaning, "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal," (16 U.S.C. 1362). The prohibition against take of marine mammals includes acts that "harass" the marine mammal [16 U.S.C. 1362(13)].

HARASSMENT includes any act of pursuit, torment or annoyance that has the potential to:

> *Level A:* injure a marine mammal or marine mammal stock in the wild or
>
> *Level B:* disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (16 U.S.C. 1362 (18)(a); see also 50 C.F.R. 216.3).

The National Marine Fisheries Service (NMFS) regulations implementing the MMPA further describe the term "take" to include "the negligent or intentional operation of an aircraft or vessel, or the doing of any other negligent or intentional act which results in disturbing or molesting a marine mammal" (50 CFR 216.3) (herein referred to as disturbance).

NMFS has prepared this Final Environmental Impact Statement (FEIS) in accordance with the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.), using the 1978 CEQ NEPA Regulations. The document considers the environmental consequences of alternative actions to enhance protections for Hawaiian spinner dolphins from various forms of take from human activities that cause harassment or disturbance and to reduce the impact of increased viewing and interaction on these animals. The analysis of alternatives and consequences will

inform NMFS' decisions on actions to enhance protections for spinner dolphins under the MMPA and its implementing regulations.

1.2 Background

Viewing wild marine mammals in Hawai‘i has been a popular recreational activity for both tourists and residents over the past several decades. Historically, most efforts focused on viewing humpback whales (*Megaptera novaeangliae*) during the winter months when the whales migrate from their feeding grounds off the coast of Alaska to Hawai‘i's warm and protected waters to breed and calve. However, in 2001, the International Fund for Animal Welfare (IFAW) reported an emerging dolphin watching industry in Hawai‘i, as whale watch operators looked for a year-round tour option (O'Connor *et al*. 2009). In 2017, NMFS estimated that upward of 100 tour operators provide tours that enable direct interactions with Hawaiian spinner dolphins in the MHI (Impact Assessment Inc. 2018). Tours operate out of various harbors along most of the coasts of the main Hawaiian Islands, bringing guests to well-known locations for spinner dolphin viewing. Researchers have observed up to thirteen tour boats at a time in some locations, with vessels jockeying for position on a single spinner dolphin group and more than 60 swimmers in the water to closely interact with the dolphins at once (Heenehan *et al*. 2015). In addition, a number of residents and visitors venture on their own, apart from commercial operators, to view and interact with spinner dolphins. The expectation for close interactions with wild dolphins has been encouraged by some operators and various media outlets, which routinely promote close vessel or in-water encounters with the dolphins and contradict established wildlife viewing guidelines.

In 2010, NMFS recognized five island-associated stocks and one pelagic (open sea) stock of Hawaiian spinner dolphins, and identified genetic distinctions and unique geographic residency patterns as a reason to separately manage the stocks located throughout the Hawaiian Islands (Carretta *et al*. 2011). Three of the five island-associated stocks (Kaua‘i/Ni‘ihau stock, O‘ahu/4 Islands (*i.e.*, Maui County) stock, and the Hawai‘i Island stock) are found near the MHI and thus considered resident stocks. These three stocks reside in waters surrounding their namesake island(s) out to approximately 10 nm (18.5 km) (Hill *et al*, 2010) and population estimates for each stock are small. Island-associated spinner dolphins, such as the three stocks in the MHI, have adapted complex social structures and behavioral patterns linked to specific habitats that support their high energetic demands. The daily pattern of spinner dolphins is sometimes characterized as "working the night shift," because the energetically demanding task of foraging is accomplished nightly when spinner dolphins move offshore in large groups to feed. During the day, spinner dolphins routinely return to areas closer to shore to socialize, nurture their young, and rest in preparation for nightly foraging (Norris *et al*. 1994). Throughout the day these dolphin groups visit specific habitats that are located along the coastlines of the MHI. NMFS refers to these areas as "essential daytime habitats," throughout this document, because the areas offer physical characteristics, such as close proximity to foraging areas and sand bottom habitat, which support spinner dolphin ecology by decreasing the travel distance necessary for nightly foraging bouts and increasing the dolphins' ability to visually detect predators during daytime resting behaviors.

In April 2000, the Marine Mammal Commission (MMC) released a literature review pertaining to swimming with wild dolphins. In this review, the authors noted that spinner dolphins in

Hawai‘i are being disturbed by tourist activities in areas that are critical for their well-being, and recommended that precautions be taken to protect these animals within areas critical for rest (Samuels *et al.* 2000). NMFS has received many complaints that spinner dolphins are being routinely disturbed by people attempting to closely approach and interact with the dolphins by boat or other watercraft (*e.g.*, kayaks), or in the water (*e.g.*, snorkel, or "swim-with-wild-dolphins" activities). Concerns over human-dolphin interactions have been expressed by officials from the Hawai‘i Department of Land and Natural Resources and the U.S. Marine Mammal Commission (MMC), as well as various members of the public, including representatives of the Native Hawaiian community, scientific researchers, wildlife conservation organizations, public display organizations, and some commercial tour operators. These concerns about disturbance to spinner dolphins prompted NMFS to raise the topic of enhancing protections for these animals in an Advance Notice of Proposed Rulemaking (ANPR) (70 FR 73426, December 12, 2005). In the public comment period, many of the public comments reiterated the concerns expressed by the MMC.

Essential daytime habitats have been increasingly targeted by commercial operators and individuals interested in viewing or interacting with Hawaiian spinner dolphins because the likelihood of encounters with dolphins in these areas are virtually guaranteed. These essential daytime habitats have attracted people interested in experiencing close interactions with wild dolphins. Some interactions with people in essential daytime habitats disrupt the spinner dolphins' behavior patterns, resulting in disturbance to individual dolphins and/or resting groups.

Peer reviewed scientific literature has documented disturbance responses by individual spinner dolphins, as well as changes to spinner dolphin group behavior patterns over time. Individual dolphin responses include changes to aerial displays when closely approached by vessels and swimmers (Forest 2001; Courbis and Timmel 2009), avoidance behaviors including moving around and away from swimmers and vessels, or leaving the bay in response to human pursuit (Ostman-Lind *et al.* 2004; Courbis 2004, Courbis and Timmel 2009); and aggressive behaviors directed at people, including charging or threat displays (Norris *et al.* 1985; Norris *et al.* 1994). Effects have also been documented in the form of changes to spinner dolphins' behavior patterns in essential daytime habitats including changes to patterns associated with aerial behaviors, residence times, and distribution within the habitat (Courbis 2004, 2007; Timmel *et al.* 2008, Östman-Lind 2007, Danil *et al.* 2005, Forest 2001). Human-caused disturbances to daily behaviors may be incidents of take, as defined (and prohibited) under the MMPA and its implementing regulations, and the chronic nature of these problems in Hawai‘i and the observed changes to behavioral patterns overtime are a cause for concern for this wildlife population.

Animal response to disturbance is influenced by multiple variables, including, but not limited to, the health of the individual at initial response and the severity of the disturbance; however, the principle issue of concern regarding disturbance events is whether the source of disturbance is capable of altering the animal's ability to exploit important resources that are essential to the health and well-being of the population (Gill 2007). Disturbances that are especially intense or chronic may prevent an animal from benefiting from the environmental characteristics that made the animal select the habitat in the first place or cause the animal to flee the habitat thereby abandoning those benefits.

For Hawaiian spinner dolphins, like many other wildlife species, repeated disturbance throughout the day in essential daytime habitat may have several outcomes (Frid and Dill 2002). If a spinner dolphin remains in the area of disturbance, the incidents of disturbance interrupt normal behaviors and detract from the dolphins' abilities to engage in fitness-enhancing activities, such as rest, nurturing young, or socializing, for normal periods. Deficits in these behavioral and energetic budgets over time are likely to negatively affect the fitness of the individual dolphins. For example, the lack of consistent, undisturbed resting periods can reduce the amount of energy available for a spinner dolphin to effectively engage in foraging activities at night. Over time, this may result in overall poor body condition, which reduces the dolphin's ability to fight off disease, successfully reproduce, protect itself from predators or successfully rear its young. Spinner dolphins may also choose to leave or avoid an area due to chronic disturbance because the energetically beneficial resources found in that area no longer outweigh the energetic costs of responding to continued disturbances. Spinner dolphins fleeing to less-optimal habitat may additionally be at risk of impacts to individual fitness if energetic expenditure within these new habitats outweighs the energetic gain from surrounding resources.

Hawaiian spinner dolphins rely on group dynamics to support their individual fitness needs as they forage, travel, rest, socialize, and care for their young (Norris *et al*. 1994, Au and Benoit-Bird 2008). Within small resident populations, where individuals are reliant on group efficiency and effectiveness, activities negatively affecting multiple individuals can have group-level impacts. In other dolphin populations, chronic disturbance to normal behavior patterns has been linked to biologically significant impacts, such as habitat abandonment and reduced female reproductive success (Bejder 2005, Bejder *et al*. 2006a, 2006b; Lusseau and Bejder 2007). Hawaiian spinner dolphins experiencing chronic disturbance are at risk and may experience similar effects. Further, these types of impacts may be amplified in closed, or isolated, resident populations (Bejder 2005) because the impacts to multiple individuals' health and fitness are quickly reflected in the overall fitness of these closed populations. Accordingly, the small resident spinner dolphin populations of the MHI may be more vulnerable to negative impacts from human disturbance.

Long-term data sets tracking the animals' individual residency patterns or reproductive success are not available for resident stocks of Hawaiian spinner dolphins; therefore, it is not known if resident Hawaiian spinner dolphin populations already show signs of long-term fitness impacts from this increase in spinner dolphin-directed activities. However, the growing body of evidence demonstrates spinner dolphins are exhibiting responses to chronic disturbance within essential daytime habitats (Courbis 2004, 2007; Timmel *et al*. 2008, Östman-Lind 2007, Danil *et al*. 2005, Forest 2001, Thorne *et al*. 2012, Johnston *et al.* 2013, Heenehan *et al*. 2014, Heenehan *et al.* 2016, Heenehan *et al.* 2017, Tyne *et al*. 2014, Tyne 2015, Tyne *et al*. 2015, Tyne *et al*. 2016, Tyne *et al*. 2017, Tyne *et al.* 2018).

Studies involving Hawaiian spinner dolphins found a heightened state of alertness in response to swimmers and vessels, and that in some resting areas with consistent levels of exposure to human activity, observed resting activity is more of a vigilant state that does not represent a natural resting state (Danil *et al.* 2005; Tyne 2018). Remaining in a state of constant vigilance without recovering with adequate rest can hinder the abilities of spinner dolphins to effectively forage and avoid predators (Dukas & Clark 1995; Benoit-Bird & Au 2003; Tyne *et al.* 2018).

Thus, an inability to achieve a natural resting state could potential cause negative population-wide impacts to spinner dolphins over time. NMFS is particularly concerned given that these are small, closed or isolated populations, where disturbance effects may be amplified (Bejder 2005), indicating a need for more effective management under the MMPA.

The NEPA defines scoping as an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action (40 CFR 1501.7). Based on internal and external scoping, and gathering of scientific information, NMFS determined that additional regulations are necessary to prohibit certain activities (including swim-with and approach within 50 yards, as discussed below) that result in take of Hawaiian spinner dolphins, and that current MMPA regulations have not provided sufficient protections for this species. MMPA prohibitions do not identify specific human activities that have the potential to disturb spinner dolphins. Therefore, NMFS deems it necessary and appropriate to adopt regulations to enhance protections for Hawaiian spinner dolphins from these forms of take. By taking measures to prevent take during important resting periods and allowing spinner dolphins to engage in normal fitness-enhancing behaviors, NMFS will be able to prevent long-term negative impacts to the population, as well as meet the statutory requirements of the MMPA.

1.3 Current Protective Measures in Place

1.3.1 Marine Mammal Protection Act: Statutory Requirements, Authorities, and Prohibitions

The MMPA enacts policy and provisions to protect and preserve marine mammals as functioning parts of the marine ecosystem. In doing so, the MMPA acknowledges the importance of protecting species and stocks from the adverse effects of human activity (16 U.S.C. 1361). Under the MMPA, the National Oceanic and Atmospheric Administration (NOAA), under the Secretary of Commerce, is given the responsibility, authority, funding and duties for the order Cetacea, which includes Hawaiian spinner dolphins.

One of the key policies for marine mammal protection established by the MMPA is a moratorium on taking and importing marine mammals and marine mammal products (16 U.S.C. 1371). The MMPA defines "take" (or taking) as meaning, "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal" (16 U.S.C. 1362). The term "harassment" is defined as "any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A Harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B Harassment]" (16 U.S.C. 1362).

In addition, NMFS' regulations implementing the MMPA further describe the term "take" to include "the negligent or intentional operation of an aircraft or vessel, or the doing of any other negligent or intentional act which results in disturbing or molesting a marine mammal; and feeding or attempting to feed a marine mammal in the wild" (50 CFR 216.3). The MMPA provides limited exceptions to the prohibitions on take for activities such as scientific research,

public displays, and incidental take in commercial fisheries. These activities require a permit or authorization that may only be issued after a thorough agency review.

Adherence to prohibitions on take is intended to provide protection to marine mammals from human activities; however, these prohibitions do not prohibit specified actions. Instead, the MMPA confers the responsibility to the Secretary of Commerce to prescribe regulatory measures deemed "necessary and appropriate" regarding the taking of marine mammals to ensure that species and population stocks are protected in accordance with the Act (16 U.S.C. 1373 (a)). In doing so, the Secretary conducts appropriate analyses on the basis of the "best scientific evidence available" in consultation with the Marine Mammal Commission (16 U.S.C. 1373 (a)).
The MMPA requires that people and organizations conduct wildlife viewing in a manner that does not cause take. However, for certain species in specific locations, NMFS recognizes a need for additional protections from human activities that result in take (including wildlife viewing) and has promulgated regulations to reduce these activities to ensure the conservation of specific species. NMFS based each rule on the biology of the marine mammals and the available information on the nature of the threats. Examples of these types of regulations include: a 100 yard (91.4-m) approach limit for humpback whales in Hawai'i (60 FR 3775, January 19, 1995); a 100 yard approach limit for humpback whales in Alaska, which included a speed restriction in the vicinity of the whale (66 FR 29502, May 31, 2001); prohibitions against approaching a North Atlantic right whale within 500 yards (457.2 m) (62 FR 6729, February 13, 1997); size-specific vessel speed restrictions within specific areas along the east coast of the U.S. Atlantic to protect North Atlantic right whales (73 FR 60173; October 10, 2008); and a 200-yard (182.9-m) approach limit for killer whales and prohibitions against vessels intercepting a killer whale or positioning the vessel in its path in the inland waters of Washington state (76 FR 20870; April 14, 2011). The specificities of these regulations convey to the public details necessary to better protect these populations, thereby enhancing the protections for these populations under the MMPA.

1.3.2 Current Viewing Guidelines for Hawaiian Marine Wildlife

As noted above, the MMPA requires marine mammal viewing be conducted in a manner that does not cause take. To assist the public in meeting these requirements, as well as to meet obligations for protecting endangered and threatened wildlife listed under the Endangered Species Act (ESA), NMFS has provided general guidance for conducting responsible wildlife viewing that avoids causing disturbance or harassment of protected wildlife species (http://www.nmfs.noaa.gov/pr/pdfs/education/viewing_wildlife.pdf). In addition, each of the five NMFS Regions has developed recommended viewing guidelines, which are relevant to protected species within the region, to educate the public on how to responsibly view these animals in the wild. These guidelines are available online at:
http://www.nmfs.noaa.gov/prot_res/MMWatch/MMViewing.html. Although aimed at assisting the public in meeting their obligations under the MMPA and ESA, the suggested practices provided in guidelines are not binding or enforceable.

These NMFS guidelines are consistent with the philosophy of responsible wildlife viewing advocated by many agencies and national advocacy groups to unobtrusively observe the natural behavior of wild animals in their habitats without causing disturbance (see

http://www.watchablewildlife.org/ and
http://www.watchablewildlife.org/publications/marine_wildlife_viewing_guidelines.htm).

1.3.3 Existing Supplemental Non-Regulatory Management Measures

In addition to the guidance provided to the public regarding protected wildlife viewing, NMFS initiated industry-specific tour programs in various NMFS regions to support protection of marine mammals that are targeted for wildlife viewing. In Hawai‘i, this includes employing the Dolphin SMART voluntary program.

Dolphin SMART is a partnership program developed by NOAA's Office of National Marine Sanctuaries and NMFS, the Whale and Dolphin Conservation Society, and the Dolphin Ecology Project, as well as local businesses and members of the public, who teamed up and developed a unique, multifaceted program encouraging the responsible viewing of wild dolphins, recognizing businesses that participated in the process. The partnering groups launched the program in 2007 in Key West, Florida and expanded to Alabama, the Central and Southwest Florida coast and most recently to Hawai‘i in 2011.

The NMFS Pacific Islands Regional Office (PIRO) continues to develop the Dolphin SMART program in Hawai‘i to aid in educational and outreach efforts for Hawaiian spinner dolphin management and conservation. PIRO held an introductory meeting in December 2008 for spinner dolphin tour operators on O‘ahu to gauge the level of interest in participation, and held the first Dolphin SMART training on O‘ahu in September 2011. The Dolphin SMART program has currently recognized businesses on O‘ahu, Kaua‘i, and Maui.

The Dolphin SMART program goals are to minimize the potential of wild dolphin harassment caused by commercial viewing activities, reduce expectations of close interaction with wild dolphins in a manner that may cause harassment, address advertising that creates expectations of engaging in activities that may cause harassment and promote responsible stewardship of dolphins in local coastal waterways. The “SMART” acronym stands for:

Stay back 50 yards from dolphins
Move cautiously away if dolphins show signs of disturbance
Always put your engine in neutral when dolphins are near
Refrain from feeding, touching, or swimming with wild dolphins
Teach others to be Dolphin SMART

More information on the Dolphin SMART program can be found at the following websites:
www.dolphinsmart.org or www.facebook.com/OfficialDolphinSmart

1.4 Scientific Evidence of Impacts to Small Cetaceans Caused by Human Interactions

Providing evidence for long-term impacts to populations as a result of human activities can be challenging for long-lived species without a robust data set that incorporates a detailed

knowledge of individuals and population dynamics. These obstacles are particularly difficult to overcome when studying cetaceans due to the logistical challenges of observing aquatic species in the wild. Despite these constraints, there are a growing number of scientific research studies that have documented the effects of human disturbance on small cetaceans that point to the potential for long-term population impacts. These studies recorded short-term behavioral avoidance and disturbance responses to human-activities and compare spinner dolphin behavioral patterns to data from previous studies to assess the occurrence of changes or trends in the species' ecology and in the population. This section reviews scientific evidence indicating increases in human disturbance or disruption to Hawaiian spinner dolphin behaviors, discusses observed spinner dolphin responses to human disturbances and describes additional studies that indicate that chronic disturbances may have long-term impacts on individual dolphins and populations. This body of evidence provides ample cause for concern and indicates a need for precautionary measures to prevent long-term impacts to Hawaiian spinner dolphins.

1.4.1 Spinner Dolphin Studies

Comparisons of short-term studies that have evaluated spinner dolphin behavior and human interaction in resting habitats in Hawai‘i indicate an increase in human use of these areas and changes in the dolphins' behavioral patterns over time. Researchers evaluated the differences in human use of Hawaiian spinner dolphin resting habitat, and the effects that vessels and swimmers had on spinner dolphins within Kealakekua Bay, Hōnaunau Bay, and Kauhakō Bay (Courbis 2007; Courbis and Timmel 2009). These studies compared observations between bays and compared these observations to past studies within these areas. Courbis (2007) examined whether spinner dolphin presence in the bays had the potential to attract swimmers and vessels. Results demonstrated that the mean number of swimmers was significantly higher in Kauhakō Bay when spinner dolphins were present, suggesting that either more swimmers were in the bay on days with the dolphins, or swimmers spent more time in the water on those days. At Kealakekua Bay, the mean numbers of vessels and swimmers were higher per scan when spinner dolphins were present. In Hōnaunau Bay, the mean number of kayaks was significantly higher when spinner dolphins were present. Although swimmers were the dominant category of human activity recorded, the study demonstrated that each bay had different levels, types, patterns, and numbers of swimmers and vessels present that may cause disturbance to resting spinner dolphins. This study also compared the general vessel and swimmer patterns in Kealakekua Bay to past studies by Doty (1968), Norris and Dohl (1980) and Forest (2001), and found an increase in the presence of vessels and traffic over time. During the evaluation of Kealakekua Bay, Courbis never observed an absence of vessels when spinner dolphins were present. Additionally, residents living near Hōnaunau and Kauhakō bays reported an increase in swimmer and vessel traffic in these bays over the past decade.

In examining Hawaiian spinner dolphin behavior in response to increased vessels and swimmers at these same sites, Courbis and Timmel (2009) found differences in spinner dolphin aerial behavior patterns throughout the day compared with earlier studies. Past studies indicated higher aerial behavior upon spinner dolphins' entry to Kealakekua Bay in early to mid-morning and as the dolphins exit from the bay in late afternoon, and less aerial activity during midday (Norris and Dohl 1980, Forest 2001); these patterns appear consistent with other sites in the islands (Lammers 2004, Danil *et al*. 2005). In contrast, Courbis (2007) did not record peaks in aerial activity upon entry to and exit from Kealakekua or Hōnaunau Bay. Observations indicated an

increase in midday aerial behavior during what had previously been observed as resting time, and/or a decrease in aerial behavior in the morning and afternoon. Courbis suggested that increases in human use at these sites may be affecting the daytime behavior patterns of the dolphins, and that spinner dolphins may have altered aerial behaviors in an attempt to enter and exit the bays undetected by people. Forest (2001) also recorded these decreases in aerial behavior during entry or exit from the bays when comparing sighting records of spinner dolphins in Kealakekua Bay from 1979–1980 and 1993–1994. She suggested human disturbance was a cause of the behavior change.

After comparing Hawaiian spinner dolphin aerial behaviors across the sites, Courbis (2007), found aerial behavior to be significantly higher at Kauhakō Bay during historic resting times. She found that human behavior at this bay was mostly spinner dolphin-directed, with swimmers most often seeking to approach and attempting to interact with the dolphins, suggesting that spinner dolphins at this site may be experiencing enough disturbance to elicit a stronger behavioral response. This idea is supported by specific instances in the study sites in which aerial behavior appeared closely correlated with approaches from vessels and swimmers. Within Kauhakō Bay, Courbis (2004), also recorded spinner dolphin avoidance of swimmers and observed the dolphins leaving the bay in response to being followed. Additionally, Courbis (2007) reported changes in the location of resting spots within Kealakekua Bay from previous studies by Doty (1968) and Norris and Dohl (1980), and warned that changes in location could be a precursor to abandonment of the bay with future increases in traffic.

In addition, Timmel *et al*. (2008), reported avoidance behavior while examining the effects of human traffic on the movement patterns of Hawaiian spinner dolphins within Kealakekua Bay. When approached, spinner dolphins remained in the same location for several minutes, but then moved in a directed manner away from the pursuing swimmers and kayakers. These recorded responses suggested that spinner dolphins might tolerate the close presence of swimmers and vessels for a time, but that the dolphins were intolerant of prolonged interactions. Additionally, the dolphins' direction of travel was observed to alter more frequently as the number of nearby swimmers and/or vessels increased. In comparing these responses to other dolphin-response studies, Timmel and colleagues indicated that dolphin populations at different locations might have evolved different strategies for avoiding vessels.

Behavior changes were also documented at Kealakekua Bay by Östman-Lind *et al.* (2004), who found that human disturbance was highest in mid-morning when Hawaiian spinner dolphins begin their rest period. Observed behavior changes included spinner dolphins being displaced from primary resting areas by vessel and swimmer presence, and the dolphins were observed using secondary resting areas to avoid areas of high human traffic. Later, Östman-Lind (2009) documented a change in spinner dolphin behavior as a result of a public closure of Kealakekua Bay. Following a 2006 earthquake and subsequent landslide, Kealakekua Bay was closed due to safety concerns. During the 3-week closure period, Östman-Lind recorded an increase in spinner dolphin use of the bay and a decrease in frequency of both acrobatic and lower-energy slaps and splashes displayed by the dolphins. Following the reopening of the bay, both the dolphins' use of the bay and frequency of acrobatic behaviors returned to pre-closure levels. Östman-Lind (2009) suggested that spinner dolphin behavior is highly affected by human presence and that the closure of resting areas may reverse impacts to these populations.

Research conducted on Hawaiian spinner dolphins off the Waiʻanae coast of Oʻahu at Mākua Bay also provides some specific findings regarding the potential effects of swimmers on spinner dolphins' daytime behaviors. According to a study by Danil *et al*. (2005), this area of Oʻahu is a well-known resting habitat for spinner dolphins and is a popular area for swimmers to visit with the intention to encounter the dolphins. The study confirmed the significance of this area as a resting habitat for spinner dolphins, with the dolphins' presence recorded on 98% of observed days. Within this period, the researchers documented a greater number of swimmers in the morning and a general absence of swimmers in the afternoon. In the morning, the researchers often saw swimmers in close proximity to or in pursuit of spinner dolphins, with 65% of the swimmers within 100 m of the dolphins. As the number of swimmers increased, the dolphins departed the area at earlier times during the day, possibly indicating reduced rest periods in response to swimmer presence.

Danil *et al*. (2005) noted that on several occasions smaller spinner dolphin groups (fewer than 25 animals) refrained from entering Mākua Bay when swimmer presence was high. The authors suggested that the observed spinner dolphin rest patterns were altered in order to accommodate and adapt to the swimmers' occurrence. The authors predicted that swimmer presence keeps the dolphins in a constant state of alertness and vigilance, and that delayed diving behavior (in the morning during swimmers' presence) may indicate a diminished quality of rest. The authors further suggested that spinner dolphins may ameliorate the potential for this disturbance by choosing to use alternate rest areas or by remaining offshore, and that some schools may have already selected these strategies to avoid swimmers.

Spinner dolphin responses to human interactions have been observed in other resting locations globally. In French Polynesia, in a bay of Tahiti similar to Kealakekua Bay, spinner dolphin residence times were negatively influenced by boat presence (Gannier and Petiau 2006). Researchers observed spinner dolphins leaving the bay earlier when there was an increase in boat pressure during peak weekend boating times, and some of the results suggested that maximum boat disturbance during the weekend might deter the dolphins from entering the bay the next day.

Additionally, in Samadai Reef, Egypt, spinner dolphins were reported by the researchers as appearing noticeably distressed from excessive numbers of visitors and people attempting to interact with the dolphins (Notarbartolo di Sciara *et a*l. 2009). The spinner dolphin group abandoned this preferred resting area, presumably to avoid the disturbance from vessels and visitors (Nature Conservation Sector 2006) and did not return to the site until after management measures were put in place to prevent human entry into the core resting area, and authorities established restrictions in areas surrounding the core resting area to prevent further disturbance (Nature Conservation Sector 2006, Notarbartolo di Sciara *et al*. 2009).

A recent study was undertaken at two additional sites in Egypt, Satayah and Qubbat'Isa reefs, as well as the site at Samadai Reef (Fumagalli *et al*. 2018). The Satayah Reef site tourism is unregulated, while the Samadai Reef site is regulated. The site at Qubbat'Isa Reef does not have any swim-with-dolphin tourism occurring at the site, and was used as a control site. Compared with the Qubbat'Isa control site, behavioral reactions to boats and swimmers at the two tourism sites suggested that dolphin rest was disrupted, especially at Satayah, where dolphin tourism is

unregulated. The results also indicated that the dolphin protection measures at Samadai Reef reduce the level of disturbance.

1.4.2 Spinner Dolphin Acoustic Population Parameters and Human Impact Research (SAPPHIRE)

During the initial scoping period, NMFS received comments that acknowledged the importance of gathering additional information on Hawaiian spinner dolphins, including monitoring local populations to determine impacts to the numbers and overall health of the resident spinner dolphins. NMFS acknowledged that these comments are important to address, regardless of any initiative to move forward with management measures. To answer this need, NMFS and the Marine Mammal Commission provided funding to the Spinner Dolphin Acoustics, Population Parameters and Human Impact Research (SAPPHIRE) program, which is run jointly by Duke University and Murdoch University. SAPPHIRE's objective was to provide baseline data on the local abundance, distribution, and behavior of spinner dolphins in Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay, and Makako Bay, as well as in the near-shore, shallow-water environments outside these resting bays of Hawai‘i Island. This intensive study integrated a suite of visual and acoustic sampling techniques, using boat- and land-based surveys, and acoustic recording devices to assess the following:

- Spinner dolphin daytime habitat use and resting behavior in study areas and surrounding waters
- Residency and fidelity patterns of spinner dolphins during the day in near-shore habitats in both the study areas and surrounding waters
- Spinner dolphin exposure to human activities within the studied resting bays and surrounding waters
- Spinner dolphin demographic response to human activities within resting bays and surrounding waters

Research in the four bays and near-shore waters began in August 2010 and ended in May 2013. Many of the results from the SAPPHIRE project have been published in scientific literature and scientific reports and were used to inform this rulemaking process (Thorne *et al.* 2012, Johnston *et al.* 2013, Heenehan *et al.* 2014, Heenehan *et al.* 2016, Heenehan *et al.* 2017, Tyne *et al.* 2014, Tyne 2015, Tyne *et al.* 2015, Tyne *et al.* 2016, Tyne *et al.* 2017, Tyne *et al.* 2018). These publications and reports using past information and information collected throughout this project provide new insight into the ecology of resident spinner dolphins and the pressures that these populations face.

Two recent studies used spinner dolphin sightings and behavioral observations to identify ecological characteristics that support resident spinner dolphin ecology. The first, by Thorne *et al.* (2012), used a series of dolphin sightings from recent surveys in the MHI collected between 2000 and 2010 to quantitatively test environmental factors that contribute to spinner dolphin resting habitats and predict the locations of resting habitat in the MHI. Environmental variables included in the model reflected factors that Norris and Dohl (1980) and Norris *et al.* (1994) described as important to resting spinner dolphins based on detailed observations. These earlier studies describe spinner dolphins selecting shallow, calm, flat, protected, sandy bays that provide

easy access to deep water foraging areas for resting habitat, and preferring areas with depths of less than 50 m with sufficient bay area for their resting behaviors. Thorne *et al.* (2012) characterized habitat relationships and generated spatial predictions by modeling spinner dolphin resting habitat in the MHI. The model results indicated that proximity to deep water foraging areas, depth, the proportion of bays with shallow depths and rugosity were important predictors of spinner dolphin habitat. The strongest predictors of spinner dolphin resting habitat were 1) proximity to the 100 m depth contour and 2) depth - with spinner dolphin resting habitat generally occurring in shallow depths that were close to the 100 m depth contour. The importance of the distance to the 100 m depth contour variable indicated that proximity to deep water was an important factor in predicting spinner dolphin habitat. The model identified only a small number of bays (21 of 99) as providing suitable habitat for resting spinner dolphins. These bays overlap well with known spinner dolphin resting habitat and include those areas proposed for time-area closures.

To take a closer look at how key ecological characteristics support spinner dolphin resting behavior, Tyne *et al.* (2014) used spinner dolphin behavioral observations collected from inside and outside of bays and used a model to identify those habitat features that contribute to the occurrence of resting behavior. These coastal models indicated that spinner dolphins along Hawai‘i's coast were unlikely to rest outside sheltered bays and that spinner dolphins spend a significant proportion of time resting inside bays. Looking at two models from data inside Kauhakō Bay and Kealakekua Bay, they found that spinner dolphin resting behavior occurred throughout daytime hours (6 AM to 6 PM), with most rest occurring between 10 AM and 2 PM. Although habitat variables, such as depth and distance from shore, have been indicated in past research as important environmental characteristics for predicting resting habitat, they were not important predictors of rest; this evaluation revealed that dolphins’ presence within a bay was the most important factor contributing to the likelihood of rest. Beyond this important factor, the authors noted that the interaction between substrate type and in-bay presence suggests that substrate, particularly sand, is partially influential in predicting resting behavior. In general, spinner dolphins spent disproportionately more time over sandy substrates in and out of bays; however, outside of bays, the researchers observed that spinner dolphins mostly travelled. In conclusion, this work indicates that management efforts to support rest must take into account the role that habitat areas play in supporting important fitness enhancing behaviors.

Hawaiian spinner dolphin resting habitats are often popular areas that draw people for a variety of activities; therefore, the bays that are an important resource for spinner dolphins may also be an important resource for other users. Heenehan *et al*. (2015) assessed differences in resource use of Makako Bay and Kealakeua Bay and explored how community-based conservation may support management efforts for these important habitats. In reviewing differences between the bays, they found that Makako Bay showed a higher amount of human use when spinner dolphins were present, similar to Courbis' results for Kauhakō Bay (Courbis 2007). However, activities in Kealakekua Bay were not driven by dolphin presence and the bay had an overall higher diversity of human use and activity. When comparing the presence or absence of specific attributes that may support community-based conservation, the researchers found that Kealakekua Bay had a higher number of these attributes present, suggesting that this bay may have a higher potential for the emergence of a community-based conservation regime (Heenehan *et al.* 2015). However, they warned that the higher human-use of this bay also may be an obstacle for a community-

based regime to be successful. This study points out that the variation between the use of the bays is important to consider as management efforts move forward for Hawaiian spinner dolphins, and that stakeholder input may create a more effective regulation, especially in certain areas. Additionally, the team noted that a common understanding of the nature of the problem is an important attribute to cultivate in moving forward with management efforts.

Johnson *et al*. (2013) assessed the influence of human activity on the energy budget of Hawaiian spinner dolphins using a theoretical model of the daily activity cycle of the dolphins off Hawai‘i Island and compared predictions from the model to data collected in Kealakekua Bay. The best fitting model predicted that in the absence of human activity within 300 m dolphins spent more time resting. Notably, results from this study may suggest that dolphins may perceive the risk associated with swimmers and vessels differently, as swimmers within 150 m resulted in significant decreases in the likelihood to rest. In contrast, the likelihood of rest was higher when vessels were present between 50 and 150 m in comparison to the presence of swimmers. Researchers suggest that these results may demonstrate a difference in perceived risk between swimmers and vessels, or a lack of perceived risk associated with vessels, but note that a high frequency of observations with vessels present between 50-300 m during rest may be influencing the positive relationship between vessels and resting spinner dolphins. Under the theoretical model, individual dolphins need to spend at least 60% of the 11 hours spent inshore in a resting state in order to be at a positive daily energetic balance and were estimated to spend 82 % of their time resting during the day under this model. In contrast, groups were observed in a resting state 66 % of the time in direct observations (Johnson *et al*. 2013). While this information suggests that dolphins are meeting their daily requirements for rest, increases in disturbance could leave individuals at a deficit. Further, some individuals may already be faced with a deficit, because this model was unable to take into consideration times when energetic demands may be increased, such as during lactation or juvenile growth.

Heenahan *et al*. (2017) also used acoustic recording devices to study human-caused soundscape impacts within the spinner dolphins' daytime habitats and correlated this with the dolphins' acoustic behavior. Spinner dolphins are typically acoustically quiet while resting, so increased acoustic response is indicative of decreased resting behavior. The authors found that the dolphins had the greatest acoustic response to vessels in Makako Bay and detected no acoustic response to vessels in Kealakekua, Hōnaunau, or Kauhakō bays. This difference can be attributed to the high number of swim-with-dolphin tour vessels in Makako Bay that are constantly moving to get close to the dolphins while in the bay, whereas the vessels in Kealakekua Bay are there to drop off snorkelers on the reef and typically turn off their engines while in the bay. There are very few vessels in the other two bays. The dolphins had the greatest acoustic response to swimmers and snorkelers in Makako Bay, with weaker responses in Hōnaunau and Kauhakō bays.

1.4.3 Small Cetacean Studies

The negative effect of human-induced disturbance or disruptions to dolphin behaviors has not only been documented with spinner dolphins, but also appears to be a worldwide concern with other small cetaceans that are subject to wildlife viewing activities. Studies in New Zealand examined bottlenose dolphin response to tourism activities in Milford Sound. Lusseau and Bejder (2007) found that dolphins demonstrated increased time spent travelling and decreased time spent resting while avoiding boats. Avoidance strategies took on a longer-term response

during high tourism traffic seasons (Lusseau 2004, Lusseau and Bejder 2007), and the dolphins avoided Milford Sound at these times. Lusseau (2004) examined this avoidance strategy and determined that the dolphins appear to be maintaining boat interactions below a certain level. The threshold that seemed to elicit the longer-term response in Milford Sound was dolphin-boat interactions that occurred less than 68 minutes apart, according to his study. He hypothesized that this threshold likely represents the point at which it is too energetically costly for the dolphins, causing them to switch from short-term displacement (*i.e.* avoidance) to longer-term responses of habitat abandonment.

To examine long-term impacts, studies in Shark Bay, Western Australia compared short-term behavioral responses of bottlenose dolphins to disturbance from vessels — especially dolphin tourism vessels — with long-term population data. These studies documented not only immediate behavioral responses to vessel traffic, but also declines in the relative abundance of dolphins and decreases in female reproductive success at the higher traffic study site (Bejder 2005, Bejder *et al.* 2006a, 2006b). Two sites, one low-vessel (control) and one high-vessel, were studied in Shark Bay, where long-term population studies of the dolphins provided long-term individual residency and reproductive data. At both sites, dolphin groups approached by vessels became more compact, had higher rates of change in membership, and had more erratic speeds and directions of travel; however, dolphin responses to vessels were more pronounced at the control site (Bejder *et al.* 2006b). After comparing the two sites over time, researchers found a decline in relative abundance of dolphins at the high-vessel site, which equated to a loss of 1 in every 7 individuals (Bejder *et al.* 2006a). They suggested that the more pronounced reactions at the control site, coupled with the decline information, indicates that vessel traffic may have exceeded the sensitive animals' tolerance threshold prior to commencement of the study, and that these dolphins abandoned the habitat, resulting in the observed decline in relative abundance, at least in part (Bejder *et al.* 2006a, 2006b).

Other investigations examined the relationship between cumulative vessel exposure and female bottlenose dolphins' reproductive success at these sites, and found decreased reproductive success in individuals with greater cumulative vessel exposure (Bejder 2005). Specifically, the study indicated that female dolphins with increased cumulative vessel exposure were still giving birth to calves, but that these calves were not surviving to weaning. The stress from increased vessel exposure may have lowered the mothers' ability to adequately feed and care for their calves resulting in decreased calf survival due to malnutrition, increased disease susceptibility, or increased predation. Bejder (2005, 2006a) cautioned that dolphin tourism activities that are often presumed to be low-impact should not be ignored given the potential for long-term consequences, and that the impacts may be amplified for small, closed or isolated, resident cetacean populations. While not specifically mentioned by Bejder in this study, it is important to note here that Hawaiian spinner dolphins fit this description of small, closed or isolated, resident cetacean populations.

In a study of bottlenose dolphins' (*Tursiops sp.*) behaviors at 13 sites off the coast of South Australia, Cribb and Seuront (2016) found that the stress component, indicating loss of diving behavioral complexity, significantly increased at all of the study sites when boats were within 100 m of the dolphins. In another study done on the Burranan dolphin (*Tursiops australis*) at Port Phillip Bay off the coast of Melbourne, Australia, Filby *et al.* (2017) found the presence of

swim-with-dolphin (SWD) vessels affected dolphins' travelling, foraging, milling, and socializing behaviors. The time dolphins spent foraging in the presence of SWD vessels was significantly reduced, with average foraging bout length decreasing by 13.6%, foraging recovery time increasing by 47.6%, and the probability of transitioning from foraging to milling increasing 4-fold. Dolphins also spent significantly more time milling and socializing in the presence of SWD vessels. The authors surmised the reduction in time spent foraging when SWD vessels are present could lead to a decrease in dolphins' rate of energy acquisition, while the increase in milling could increase their energy expenditure and may lead to reduced biological fitness with population level consequences. Although the short-term behavioral budget of the dolphin population was significantly affected, SWD vessels, which operate seasonally between October and May at this location, did not significantly affect the cumulative (i.e. yearly) behavioral budget of Burrunan dolphins.

In summary, scientific studies have shown that human activities, particularly those involving viewing or interacting with cetaceans, can result in disturbance or disruptions to the cetaceans' behavioral patterns and result in changes to the cetaceans' habitat use. These activities may initially appear to be relatively benign and dolphin responses may appear relatively short-term; however, comparison of studies over time demonstrates that small cetacean populations that are exposed to chronic disturbances may experience cumulative stress that can result in longer-term impacts to individuals and populations. Hawaiian spinner dolphins are demonstrating responses to disturbance by people within essential daytime habitats (Courbis 2004, 2007; Östman -Lind *et al*. 2004, Danil *et al*. 2005, Östman -Lind, 2007, Timmel *et al*. 2008, Heenehan *et al*. 2014; Heenehan *et al*. 2017; Ostman-Lind *et al*. 2004; Ostman-Lind 2009; Thorne *et al*. 2012; Tyne 2013; Tyne 2014; Tyne 2015; Tyne 2016; Tyne 2017; and Wiener 2016) and disturbance is occurring on a regular basis, especially in well-known resting areas. Given the small, closed or isolated nature of the resident populations, Hawaiian spinner dolphins have the potential to exhibit amplified long-term impacts — habitat displacement or abandonment, adverse impacts to reproductive fitness, and population declines — from these chronic disturbances, which presents a need for enhancing protections to prevent these long-term impacts.

1.5 Creating Effective Protections

Despite existing protections, research indicates that Hawaiian spinner dolphins' behaviors are being altered by dolphin-directed activities. To enhance protections for these resident dolphins from the long-term impacts that have been observed in other species of dolphins, NMFS reviewed the limitations in current protective measures as well as literature regarding the effectiveness of other conservation measures taken by countries facing similar disturbance issues. The following sections review this information and the initial stages for this proposed rulemaking.

1.5.1 Limitations in Current Viewing Guidelines and in Enforcing MMPA Prohibitions

Compliance with the take prohibitions and adherence to current viewing guidelines is intended to provide marine mammal populations and stocks protections from human activities that may be detrimental to their overall health and well-being. However, disturbance to Hawaiian spinner dolphins within resting habitats, as indicated in the scientific literature and communication with

enforcement personnel, indicates that compliance with current take prohibitions and adherence to viewing guidelines is poor. This section reviews information from the scoping process that identifies factors that limit protections for spinner dolphins, or influence people's compliance with the current prohibitions under the MMPA and voluntary viewing guidelines. The deficiencies in current compliance were evaluated while formulating the regulatory alternatives in Chapter 2 in an attempt to create more effective protections for Hawaiian spinner dolphins.

Most people engaged in dolphin viewing activities in Hawai'i are aware of the existence of the MMPA and the general protections that are provided to marine mammals under the MMPA (C. Wiener, researcher, personal communication, April 29, 2014). People easily understand the meaning of hunt, capture and kill, and understand the importance of prohibiting these activities to help conserve marine mammals. However, members of the public without scientific expertise on spinner dolphins may be unaware that their activities (including swimming with or approaching within 50 yards) disturbs or has the potential to disturb a marine mammal such that the activity amounts to a "take" under the MMPA.

In many cases, people may not understand that deviations from normal daytime spinner dolphin behaviors in response to human activities can be a disturbance. For example, people unfamiliar with spinner dolphin behavior and biology may not realize that spinner dolphins moving in specific patterns within essential daytime habitats are resting. Therefore, they may not recognize that moving towards spinner dolphins in these habitats disrupts dolphins' patterned rest behavior and elicits a disturbance response, such as displays of aerial behavior and/or subtle avoidance responses like swimming away. Some people may perceive the change in activity to be a welcoming response by the dolphins rather than as a departure from daytime fitness-promoting behaviors with other dolphins. For instance, comments received during scoping suggest that people interpreted aerial behaviors as dolphins demonstrating joy at being around people. Public comments received throughout the scoping period reflected a large range in knowledge regarding normal spinner dolphin behavior and in the understanding of what human activities cause disturbance to spinner dolphins' natural behavior. Many comments reflected a lack of understanding of spinner dolphin behavior. NMFS has also received inquiries from members of the public and commercial tour operators requesting information on NMFS' policy on what activities constitute harassment. This rule identifies for the public human activities that result in take of Hawaiian spinner dolphins that include harassment or other forms of disturbance as currently defined by statute and regulation.

Regulations that are consistently and fairly enforced are more effective in motivating people to comply (May 2004, 2005). Distance regulations are in place for other marine mammals and the NOAA Office for Law Enforcement has experience enforcing this type of regulation. In general, promulgation of specific mandatory regulations is likely to increase enforcement capability and compliance.

In summary, Hawaiian spinner dolphins need enhanced protections from forms of take that include harassment or disturbance of spinner dolphins throughout the day and within essential daytime habitats, because people do not adhere to current viewing guidelines and/or comply with take prohibitions. Promulgation of specific mandatory regulations for spinner dolphins is likely to increase people's ability to comply and is likely to increase compliance, which will result in

fewer incidents of take of Hawaiian spinner dolphins caused by swimmers and/or vessels than occurs under the current regime.

1.5.2 Measures Taken Internationally to Protect Marine Mammals Subject to Wildlife Viewing

Multiple countries, including the United States, have recognized the need for management measures to protect marine mammal populations that are subject to wildlife viewing and interaction. Impacts to wild populations have caused concern for the health of local marine mammal populations and the sustainability of wildlife viewing activities. In response, some areas have taken regulatory and/or voluntary measures to prevent disturbance to small cetaceans targeted for wildlife viewing with the intent of sustaining healthy local populations. In preparation for this FEIS and in accordance with recommendations received during scoping, NMFS reviewed several international management measures aimed at protecting small cetaceans. The effectiveness of these various methods and/or the recommendations provided from these management efforts was considered during the preparation, modification, and analysis of alternatives for this FEIS.

New Zealand's Marine Mammals Protection Act (1978) and Marine Mammals Protection Regulations (1992) provide protection and management measures to conserve marine mammals within their waters. Measures include, but are not limited to, issuing permits for commercial operations; implementing distance, speed, and number of vessel measures within specific proximity to marine mammals; and identifying prohibited activities that may result in movement or behavioral changes of marine mammals in the wild. More information on this may be found at: http://www.doc.govt.nz/sharingcoasts.

Despite these regulations, local bottlenose dolphins in the Doubtful Sound Complex of New Zealand have experienced a serious decline in population estimated to be between 34% and 39% in over 12 years (Currey *et al.* 2007). Multiple anthropogenic activities likely contribute to this decline in population, including tour boat activities that frequent these remote areas (Currey 2011). The Department of Conservation has implemented a voluntary Code of Management (COM) as one part of an overall strategy to better protect this population (Department of Conservation 2008). The COM implements a 200 m Dolphin Protection Zone (DPZ) out from shore within specific areas of the fjords. Boats are not permitted to enter the DPZs when dolphins are present (Department of Conservation 2008). Additionally, the COM instructs that encounters with dolphins are to be left to chance for all vessels touring the fjords (Department of Conservation 2008). Research, monitoring, and increased public awareness through education are additional parts of this management strategy.

In some areas, reviews of the effectiveness of voluntary measures revealed that the adherence to these measures is not consistent, despite communities' willingness and support for the measures (Allen *et al.* 2007, Wiley *et al.* 2008). Port Stevens, Australia, commercial operators adopted a voluntary code of conduct in 1996 to reduce perceived impacts on local dolphins (Allen *et al.* 2007). Allen and colleagues investigated the adherence to these codes, and found that one in six interactions involved a breach in conduct by operators. The commercial operators' code failed to account for the influence recreational boaters might have on operators' behavior, and failed to address consecutive viewing efforts on the same group of dolphins, according to the review. In

the New England area of the United States, noncompliance with voluntary speed restrictions occurred throughout the commercial tour industry, which supported speed restriction measures, according to Wiley *et al.* (2008). The review found that operators attributed noncompliance during the study period to intense pressures to meet industry demands due to an unusually low number of whales. Both reviews indicate that, even with support from communities, participants in voluntary agreements may not hold themselves strictly to measures when adherence is inconvenient (Allen *et al.* 2007, Wiley *et al.* 2008).

In Victoria, Australia, regulations were implemented to protect a small resident population of bottlenose dolphins in Southern Port Phillip Bay. These regulations focused on "swim-with-dolphin" tours by prescribing the way dolphins may be approached, the amount of time swimmers may be in the water, the number of swimmers allowed to be in the water at a time and the amount of time that vessels may be within a certain distance of dolphins. Total compliance was limited to the regulation that clearly indicated the number of swimmers that tours place in the water at once (Scarpaci 2004). Scarpaci noted that poor compliance with the other three regulations may be the result of unclear wording in the regulations, which also made these regulations difficult to enforce. Scarpaci recommended that writing regulations in a manner that is easy to comprehend by all operators and are easy to enforce could help resolve these problems.

Samadai Reef in Egypt has a resting area similar to the essential daytime habitats on the Island of Hawai‘i, where resident spinner dolphins use the lagoon daily for rest, caring for their young, and avoiding predators. Characterized as the "Dolphin House," the reef became a popular tourist destination for dolphin interactions, drawing upwards of 800 visitors a day to the small lagoon (Notarbartolo-di-Sciara *et al.* 2009). Researchers reported that the dolphins became noticeably distressed in response to the excessive number of visitors and the behavior of swimmers in the area (Notarbartolo-di-Sciara *et al.* 2009). Due to this increased disturbance from people, local spinner dolphins left this resting area (Nature Conservation Sector 2006). In December 2003, local governing authorities closed the area to all visits until management measures were in place (Notarbartolo-di-Sciara *et al.* 2009). Spinner dolphins subsequently returned to the resting area, and local authorities began implementing provisional management measures in January 2004 (Notarbartolo-di-Sciara *et al.* 2009). These measures created a no-entry zone for swimmers in one area of the lagoon, with a second controlled zone where swimming was restricted by time of day. Studies following implementation of the measures found spinner dolphins more in the no-entry zone than the other zones of the bay in which swimmers were allowed (Notarbartolo-di-Sciara *et al.* 2009). The events of Samadai Reef indicate that spinner dolphins may be displaced from resting habitat due to increased human disturbance, and that area closures may effectively prevent disturbance to resting spinner dolphins.

1.5.3 Advance Notice of Proposed Rulemaking and Notice of Intent to Prepare an EIS

NMFS began the process to enhance protections for Hawaiian spinner dolphins from human disturbance in 2005 by convening a Spinner Dolphin Working Group. This group consisted of representatives from the Marine Mammal Commission (MMC) and state and federal agencies that participate in spinner dolphin research and conservation. NMFS used deliberations from this working group to inform an Advance Notice of Proposed Rulemaking (ANPR) that was published in the Federal Register in December 2005 (70 FR 73426, December 12, 2005). A Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) (71 FR 57923,

October 2, 2006) followed, in which NMFS identified five preliminary alternatives for consideration and comment:

1. Partial (time-area based) closures for certain spinner dolphin resting habitats
2. A No Action Alternative
3. Establishing a minimum distance limit
4. Regulation of human behavior while in NMFS-identified spinner dolphin resting areas
5. Complete closure of all known spinner dolphin resting areas in the MHI

This notice invited information from the public on the scope of the issues that should be addressed in the FEIS, the issues of concern regarding practical considerations involved in applying the proposed regulations, and the identification of environmental and socioeconomic concerns to be addressed in the analysis. The notice also sought to determine whether NMFS is addressing the appropriate range of alternatives.

The public submitted comments through e-mail, postal mail and the regulations.gov website. The comment period for the ANPR closed on January 11, 2006; the comment period for the NOI closed on November 24, 2006. NMFS held five public scoping meetings that occurred on the Islands of Kaua‘i, O‘ahu, Maui, and Hawai‘i, providing an overview of the information in the NOI. Additionally, NMFS provided individuals with the opportunity to record oral statements. In total, NMFS received 4,641 public comments in response to the ANPR and the NOI, which were submitted by concerned citizens; tour operators; research, conservation and education groups; and Federal, State, and other government entities.

Comments from both of the public comment periods ranged widely and recommended a variety of actions for NMFS to consider, ranging from no regulations to permanent closure of areas the dolphins use for rest and shelter. Additionally, public comments raised concerns about various topics that should be addressed in the FEIS or proposed action. The final scoping report groups these concerns into various topics as follows:

- Hawaiian spinner dolphin biology and behavior
- Cultural issues
- Cumulative effects
- Data/data gaps
- Direct and indirect effects
- Education /education outreach
- Enforcement
- The Endangered Species Act
- Guidelines/solutions for other species or from other countries
- Human-dolphin interactions
- Medical benefits associated with swimming with dolphins
- The MMPA
- Monitoring

- NEPA
- Public and stakeholder involvement
- Regulatory regime
- Social and economic issues
- Spiritual and religious issues
- Take and harassment
- Hawaiian traditional knowledge
- Welfare of the dolphins

Although comments varied greatly and some expressed opposition to developing new regulations, a theme stood out in several topic areas: the need for effective and enforceable regulations. A complete analysis of scoping comments may be found in the Spinner Dolphin Human Interaction Environmental Impact Statement Public Scoping Summary Report (April 2007).

As a result of stakeholder concerns expressed through these public comment periods, and for the preparation of this document, NMFS made multiple site visits to various areas where concerns have been raised regarding Hawaiian spinner dolphin disturbance in the MHI. During these visits, NMFS met with concerned members of the public, including those with opposing and conflicting viewpoints, to gather information relevant to this analysis.

NMFS also coordinated with State and federal agencies that would be affected or whose constituents might be affected by any rulemaking. This includes coordinating with several divisions of the Hawai‘i Department of Land and Natural Resources (DLNR), the Office of Hawaiian Affairs, the National Ocean Service’s Hawaiian Islands Humpback Whale National Marine Sanctuary, the U.S. Fish and Wildlife Service’s Kilauea National Wildlife Refuge, and the National Park Service’s Koloko-Honokōhau National Historical Park (NHP), Pu‘u Honua o Hōnaunau NHP, and Kaluapapa NHP.

Since the publication of the ANPR in 2005 and the NOI in 2006, NMFS continued building upon the scoping process by engaging with community members at the sites of concern. For example, NMFS participated in the development of the Coral Reef Alliance’s West Hawai‘i Voluntary Standards for Marine Tourism in 2008 and 2009 (see section 2.10.5) to encourage a community response to the on-going problem of spinner dolphin harassment and disturbance. In response to scoping comments regarding the lack of baseline information on the status of Hawaiian spinner dolphins, NMFS provided three years of grant funding for research from 2010 through 2013. Research was conducted at four bays on the Island of Hawai‘i where human interactions with dolphins are known to occur and baseline information about population abundance, behaviors, habitat use, and human/vessel interaction was collected (the SAPPHIRE Project, section 1.4.2).

Throughout this time, NMFS explored other non-regulatory opportunities to address the harassment and disturbance problems and introduced the Dolphin SMART program to the Hawaiian Islands (section 1.3.3). While introducing this program to tour operators in meetings held throughout the State (since 2010), the utility of codified regulations was often discussed and operators were able to share information about concerns with and/or support for various types of regulations.

In addition to the NEPA process, NMFS also began a separate scoping process to determine if historic properties may be affected by alternatives under consideration for Hawaiian spinner dolphin conservation in accordance with the National Historic Preservation Act (NHPA). Native Hawaiian organizations, communities, and individuals were contacted upon recommendation from Hawai‘i’s State Historic Preservation Division and four community-scoping meetings were held in 2012 with those who expressed interest in our inquiry for information. Following these scoping meetings (in 2013), NMFS employed a consultant to conduct interviews with three lineal descendants from each of the five bays (that were identified for potential time-area closures) to assist in providing additional information about historic properties or practices that may be affected by proposed actions (Honua Consulting 2013). While information for the NHPA process focuses on impacts to historic properties, communities also shared information about potential social and cultural impacts further informing this NEPA evaluation process. NMFS will complete a separate evaluation for the NHPA process, as necessary, prior to any final agency action. However, this document discusses impacts to social and cultural impacts gathered during this process as it applies to NEPA.

1.5.4 Notice of Availability of the EIS and Public Comment Period

Upon publication of the DEIS and the Notice of Availability on August 26, 2016 (81 FR 57854), a public comment period commenced that ended on October 23, 2016. However, in response to multiple requests from the public, the comment period was later extended until December 1, 2016 (81 FR 80629). Public hearings were also held at locations throughout the main Hawaiian Islands in September 2016. During the public hearings, 145 people provided recorded, oral testimony on the proposed rule. Throughout the public comment period, NMFS received a total of 22,031 written submissions via letter, e-mail, and the Federal e-rulemaking portal. Of these comments, 2,294 were unique, with anywhere from two to 17,000 near-duplicates. Additionally, NMFS received a letter supporting swim-with and approach regulations submitted by Kama‘aina United to Protect the ‘Aina (KUPA) - Friends of Ho‘okena Beach Park (Kauhakō Bay), which contained over 285 names and signatures. Comments were submitted by individuals; research, conservation, and education groups; trade and industry associations; tour and retreat operators; federal, state, and local government entities; and others. NMFS posted all written comments received during the comment period on the federal e-rulemaking website (*https://www.regulations.gov/document?D=NOAA-2005-0226-0002*). These comments have been compiled and responses to the comments can be found in Appendix H.

NMFS received many comments voicing concerns that the information from the Economic Data Report (Impact Assessment Inc. 2007) was outdated and did not capture the potential economic impact on the swim-with-dolphin tour industry of the proposed rule. We therefore decided to update the economic data with current data that was gathered in 2017 and generated a new Economic Data Report (Impact Assessment Inc. 2018). This updated information has been incorporated into and is analyzed in this FEIS.

The information gathered from the above ongoing activities, as well as the public comments generated from the ANPR, NOI, and the DEIS public comment period, has informed and been incorporated into the development of the various alternatives and analyses under NEPA.

1.6 Description and Scope of the Proposed Action

NMFS is proposing to adopt regulations implementing Alternative 3A that would prohibit swimming with and approaching within 50 yards of Hawaiian spinner dolphins within 2 nm (3.7 km) from shore of the Hawaiian Islands and in designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe.

Hawaiian spinner dolphin-directed activities focus on the four MHI island-associated stocks of spinner dolphins, because these stocks are easily accessed by people in near-shore waters during the daytime. NMFS currently describes the range for these island-associated stocks as 10 nm (18.5 km) offshore of the islands, based on the best available sighting and tracking data (Hill *et al*. 2010). NMFS staff compiled information regarding activities of human disturbance of Hawaiian spinner dolphins in the MHI based on site visitations and stakeholder input provided through interviews and focus groups (Sepez 2006). NMFS combined this information with information from published literature, coordination with officials and stakeholders, and comments gathered through the scoping period to identify where the majority of unauthorized take may be concentrated. Table 1displays Hawaiian spinner dolphin daytime habitats identified through literature review, stakeholder coordination, and scoping efforts. The scope of areas identified in Table 1 demonstrates that Hawaiian spinner dolphins' daytime habitats are geographically dispersed, and that the need for enhanced protections may exist in various areas throughout the near-shore waters of the MHI stocks' range.

When considering the scope of potential regulations, NMFS recognized that spinner dolphin-directed activities generally occur in daylight hours (which vary throughout the year) and in near-shore areas. Due to variation in the bathymetry around the MHI, the distance from shore where spinner dolphins are found throughout the resting periods varies along and between the islands' coastlines. Because activities requiring regulatory action are less likely to occur at depths and distances where these stocks are feeding, NMFS proposes to apply the regulations for spinner dolphin-directed activities within 2 nm from shore around each island, and in designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe. NMFS is thereby restricting the scope of the swim and approach regulations to those areas where spinner dolphins are most likely to be engaged in resting activities and where dolphin-directed activities are most likely to occur (see Geographic Scope section 2.1.1.1). However, it is important to stress that unpermitted take of all marine mammals remains prohibited under section 102 of the MMPA.

Table 1: Hawaiian spinner dolphin essential daytime habitats

Island	Location of Spinner Daytime Habitat Area		
Kauaʻi	Hanalei	Līhuʻe	Secret Beach
	Hanapēpē and Kaumakani	Nāpali Coast	Waimea Coast
	Kahala Point	Poʻipū Beach	
Oʻahu	Kahana Bay	Pōkaʻī Bay	Waiʻanae Coast
	Kahe Point (Electric Beach)	Portlock	Waimea Bay
	Mākua Bay	South Shore	Yokohama Bay
Molokai	ʻĀhihi Bay (off Cape Kīnaʻu)	Hāna Coast	Kalaupapa
	Cape Hālawa	Honolua Bay	
Lānaʻi	Hulopoʻe Bay	Mānele Bay	Southeast Coast of Lānaʻi
Maui	Kāʻanapali	Lahaina	Mākena
	La Perouse Bay	Līpoa Point	Paʻuwela
Hawaiʻi (Big Island)	Ailia Point	Kapua Bay	Mahaiʻula and Makalawena
	ʻĀpua Point	Kauhakō Bay (Hoʻokena)	Māhukona (just South)
	Cape Kumakahi	Kawaihae Harbor (from Kawaihae to Honoipu)	Makako Bay (including Hoʻona Bay)
	Hōnaunau Bay	Kāwili	Manukā Bay
	Honokoa Bay	Keahole Point	Miloliʻi
	Honokōhau Harbor	Kealakekua Bay	Okoe Bay
	Honomalino Bay	Keauhou Cove	Opilukao Cove
	Honuʻapo	Kehena Beach	Puakō
	Kailua Bay	Kīholo Point	Puʻu Kuili
	Kalapana	Kua Bay	South Point
	Kaloli Point	Laupāhoehoe	Waikoloa Beach
	Kamoi Point	Leleiwi	Waipiʻo Valley Bay

The action alternatives may vary in the methods used to enhance protections for spinner dolphins from disturbance effects. Some alternatives considered in Chapter 2 focus on restricting human activities around spinner dolphins to prevent disturbance throughout the stocks' range, while other alternatives attempt to protect the quality of essential daytime habitats by preventing disturbance during resting periods, limiting access to areas where human activities are spinner

dolphin-directed, and limiting access where chronic disturbance may result in adverse impacts to the dolphins over time.

NMFS also considered whether other management measures may be necessary and appropriate to protect Hawaiian spinner dolphins from take, especially in essential daytime habitats targeted by humans for dolphin-directed activities. Accordingly, NMFS solicited public comment on alternative management options that would similarly promulgate minimum approach regulations and additionally include creating either mandatory (Alternative 4; section 2.5) or voluntary (Alternative 5; section 2.6) time-area closures in five essential daytime habitats. The time-area closures in this document address the areas where human interactions with these dolphins are most problematic. NMFS recognizes that there are problems with human interactions and resting spinner dolphins in other areas (see Table 1), and there is a possibility of expanding the enhanced protections to resting spinner dolphins in these areas if necessary and appropriate. In addition to comments on the time-are closures, NMFS solicited comments for suggestions on other areas that should be considered for time-area closures.

1.7 Changes Made in the Final EIS

In response to public comments received on the Draft EIS, NMFS added language to the second exception to the Preferred Alternative (additions in italics):

- *Any vessel that is anchored or aground and approached by a spinner dolphin, provided they do not make any effort to engage or pursue the animal(s)*.

In response to public comments received on the DEIS, NMFS added an additional exception to the Preferred Alternative:

- Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

NMFS also received many comments voicing concerns that the information from the Economic Data Report (Impact Assessment, Inc. 2007) was outdated and did not capture the potential economic impact on the swim-with-dolphin tour industry of the proposed rule. We therefore decided to update the economic data with current data that was gathered in 2017 and generated a new Economic Data Report (Impact Assessment, Inc. 2018). There have also been additional peer-reviewed research studies published in the scientific literature that are relevant to this action. The updated information has been incorporated into and is analyzed in this FEIS.

1.8 Future Research and Management

Knowledge regarding human-induced impacts to natural populations is often fragmentary because of the complex and dynamic nature of ecosystems and the variation in individual species response. Attempts to understand the detailed, long-term impacts of human induced disturbance on a long-lived species would require extensive data — including long-term reproductive data

— that is not currently available for Hawaiian spinner dolphins. Irreversible impacts to resident populations could arise while waiting for this necessary data to be collected and analyzed. Therefore, some management measures must be taken even in the absence of long-term data.

In several scoping comments, people raised concerns requesting that NMFS use research and monitoring to ensure compliance and management effectiveness of regulatory efforts. NMFS recognizes these concerns and the uncertainties associated with selecting a management policy or practice that will be most effective at enhancing protections for the spinner dolphin populations from the effects of disturbance impacts. In accordance with these requests, NMFS is considering continued research and monitoring along the Kona coast of Hawai‘i. The SAPPHIRE research program’s design — Before-After-Control-Impact (BACI) design — are conducive to a follow-up management approach; if regulations are implemented, additional research may be funded to measure the effectiveness of the implemented regulations and to continue monitoring efforts of this resident population (any research carried out after the 3-year period is contingent upon available funding).

Due to the uncertainties associated with managing dynamic biological systems, there is the potential that information gathered during research and monitoring may indicate the need for revisions to the management approach. These revisions may include site-specific adaptations, amendments to the management approach as a whole, removal of ineffective regulatory measures, or the implementation of an entirely new management regime.

Future revisions to the implemented regulations or future rulemakings would be held to the same NEPA standards, analyzed for compliance with the MMPA, and would require the same public involvement as outlined in the Administrative Procedure Act (5 U.S.C. 500 et seq.). Therefore, NMFS would analyze any future regulatory actions to determine the impacts on the environment, additional analysis will be completed as require under NEPA.

Chapter 2 - Alternatives Considered

2.1 Introduction

In the NOI, NMFS provided a preliminary list of alternative regulations to enhance protections for Hawaiian spinner dolphins from take (71 FR 57923, October 2, 2006). The notice requested public comment on the alternatives, as well as any other reasonable alternatives. NMFS received information on the preliminary alternatives, including suggestions for new alternatives, modifications to the alternatives, exceptions, potential resource impacts, and enforcement and education issues associated with the alternatives. NMFS recognizes that the best-suited alternatives would be those that meet the purpose and needs of the action, and in some way overcome the limitations that have been identified with the current compliance with MMPA prohibitions or the viewing guidelines, while still attempting to address other concerns that were raised internally or through the scoping process. To select alternatives for this analysis, NMFS identified evaluation criteria. NMFS then evaluated the alternatives raised in the NOI, identified internally, or suggested through the scoping process to determine to what extent the potential regulation would meet the criteria. NMFS split the evaluation criteria into primary criteria that must be met and secondary criteria that should be met if possible.

2.1.1 Criteria for Selecting Alternatives

To meet the purpose and need effectively, alternatives must do the following (primary criteria):

- Reduce harassment and disturbance resulting in take of Hawaiian spinner dolphins in Hawai‘i’s waters;
- Enhance protections for Hawaiian spinner dolphins from disturbances causing take within essential daytime habitats that are targeted for spinner dolphin-directed activities;
- Reduce the likelihood of long-term impacts from disturbance in essential daytime habitats, including habitat displacement and/or negative impacts to fitness of resident spinner dolphin populations;
- Be logistically feasible in terms of the cost of implementation and administration;
- Be easy to understand, allowing people to easily recognize activities that are prohibited;
- Be enforceable; and
- Minimize conflicts with traditional indigenous community and cultural practices to the extent practicable.

If possible, alternatives should also do the following (secondary criterion):

- Take into consideration stakeholder group needs (other activities occurring in the areas) as long as they are not in conflict with MMPA protections.

The alternatives analyzed in this document are those that reduce the threat of take occurring (including harassment and disturbance) to Hawaiian spinner dolphins in Hawai‘i’s waters in order to prevent take. This FEIS considers one no-action and four action alternatives described in this chapter. Alternatives that did not meet all or most of the criteria are discussed briefly at the end of this chapter, but are not analyzed in detail.

2.1.2 Elements Common to All Action Alternatives

All regulations considered in the action alternatives include these common elements:

- Regulations are aimed at enhancing protections for Hawaiian spinner dolphins from harassment and disturbance (take);
- Regulations would apply to activities and or areas within 2 nm (3.7 km) of the MHI (See Geographic Scope, below);
- Regulations would not exempt any person, vessel, or entity from the take prohibitions that already exist under the MMPA;
- The chosen alternative would be enforced by NOAA’s OLE and, subject to the availability of personnel and resources, Hawai‘i’s Department of Land and Natural Resources (DLNR), Division of Conservation and Resources Enforcement (DOCARE); and
- Activities occurring in the intertidal zone of closures areas, such as shore-based fishing and subsistence gathering, would be able to continue during any time of day.

In addition to the above, exceptions to prohibitions are described in the following sections that describe each Alternative and in Table 3.

2.1.3 Action Area and Geographic Scope (Distance from Shore)

These proposed regulations are designed to address dolphin-directed human activities that are resulting in various forms of take of Hawaiian spinner dolphins, including harassment and disturbance. Dolphin-directed activities are concentrated in the near-shore portion of the MHI island-associated Hawaiian spinner dolphin stocks' range, because these stocks are easily accessed in coastal waters during the day when most people seek out marine recreational activities. While developing the alternatives that addressed dolphin-directed activities on the water, NMFS considered whether prohibitions should apply to all waters within Hawai'i's Exclusive Economic Zone, the range of the MHI stocks— within 10 nm (18.5 km) from shore — or only to a limited area where spinner dolphins are facing intense pressure from dolphin-directed activities and where most take from dolphin-directed activities is likely to occur, such as within 2 nm (3.7 km) or 1 nm (2.4 km) from shore. To encompass the range of dolphin-directed activities that are likely to result in take we focused on where people are most likely to encounter Hawaiian spinner dolphin groups, in other words where dolphins are known to occur during the day. We reviewed information from scientific literature about Hawaiian spinner dolphin daytime habitat preferences and information from over 400 sightings of spinner dolphins collected around the MHI since 1992 from various members of the Pacific Islands Photo Identification Network (PIPIN).

Daytime habitat for Hawaiian spinner dolphins varies across the MHI, because the bathymetry, or depths and shapes of underwater terrain, are different for each island and spinner dolphins seek out areas with physical and biological characteristics that complement their ecological needs. On the Island of Hawai'i, Norris and colleagues (1994) indicated that spinner dolphins generally prefer engaging in daytime activities in waters less than 50 m deep, and Thorne *et al.* (2012) note that resting habitats generally occur in close proximity to the 100 m contour (close to the inshore extent of prey species at night). Spinner dolphins are also known to transit along Hawai'i Island's coastline moving between essential daytime habitats during the day. Lammers (2004) indicated that O'ahu's spinner dolphins show a strong affinity for 10-fathom (18.3 m) isobath (depth contour) and note that approximately 93 percent of sightings off Wai'anae and 81 percent of sightings off the south shore of O'ahu occurred at depths shallower than 17 fathoms (32 m). Lammers (2004) also noted that foraging activities begin by evening around the 100-fathom isobath (182 m) off O'ahu. Information received from PIPIN indicate that approximately 89 percent of spinner sightings were within 100 m depth and that 95 percent were within 200 m depth across the MHI, still spinner dolphins have been observed in depths out to almost 3000 m during the day (NMFS 2016).

In reviewing this information, NMFS identified that selecting a boundary based on depth in any particular area may be difficult for people to determine without proper instrumentation available (especially for kayaks, SUPs and swimmers) and that distance from shore may provide a more easily estimated boundary. Although spinner daytime habitat may be located at various distances from shore off of the different islands and even coastlines, differences in the prohibitions from location to location (*e.g.*, having restrictions out to 1 or 2 nm from shore depending on the island) would apply an additional layer of detail, creating potential confusion for the public and complicating enforcement and compliance with these regulations. This could be particularly difficult in areas where multiple islands are visible and the restrictions apply at different

distances from different islands. Therefore, NMFS evaluated consistent distances from shore across the MHI.

NMFS reviewed the habitat preferences and sighting information as it relates to distance from shore to identify a boundary that would be easier for people to recognize and would incorporate the best available information about spinner dolphin habitat preferences and sighting information. Along the west coast of Hawai‘i Island, habitats that are 50 m or less in depth and where dolphin-directed activities are prevalent, are encompassed within 1–1.5 miles (1.6–2.4 km) from shore and habitats within 100 m depth fall almost entirely within 2 miles of shore and at 3 miles these areas are entirely included. Off the west coast of O‘ahu, where most dolphin-directed activities on this island occur, the 10-fathom isobath is largely captured within 1 mile (1.6 km) of shore, while 17 fathoms (32 m) is largely captured at 1.5 miles. Habitats of these depths extend out farther on the south shore where spinner dolphins are also known to rest and are largely captured within 1.5 and 2 miles from shore respectively. The 100-fathom (182 m) contour is largely captured by 1.5 miles on the west side of the Island, but the contour extends out past 3 miles on the south shore. Little information is available from the other MHI regarding specific depth preferences, but there are areas where the 50 and 100m depth contour extends past 4 miles, and dolphin-directed activities are prevalent in these areas. Off most of the MHI a large majority of the PIPIN sighting information is captured within 2 miles from shore. A key area where the depth contour extends out past 4 miles and where spinner dolphins are sighted during the day is bounded by the islands of Maui, Lāna‘i, and Kaho‘olawe. This area is traveled by many recreational and commercial tour vessels in search of marine mammal viewing opportunities throughout the day. Consequently, spinner dolphins also require protections in this area. To ensure that dolphins are protected throughout the day where they may transit between islands and encounter dolphin-directed activities, we delineated an area around all three islands that includes the 2 nm buffer around the outside of each island and the channels and waters between these islands. This delineated area includes 96 percent of all PIPIN sighting information across the MHI.

Although unpermitted take of marine mammals, including spinner dolphins, is illegal wherever it occurs, NMFS is creating regulations to reduce the threat of take to Hawaiian spinner dolphins, including harassment and disturbance caused by dolphin-directed activities that are concentrated in coastal waters (within 2nm of shore and in designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe) and to reduce the impact of increased viewing and interaction on resident stocks. Therefore, in the proposed regulation, as well as Alternatives 2-5, NMFS determined that enhanced protections within 2 nm from shore of the MHI, consistently applied to all islands, and the channels and in designated waters bounded by the islands of Lāna‘i, Maui, and Kaho‘olawe would encompass the majority of the resident stocks’ daytime habitat around all of the islands where human interactions cause take of Hawaiian spinner dolphin, and thus promote spinner dolphin conservation.

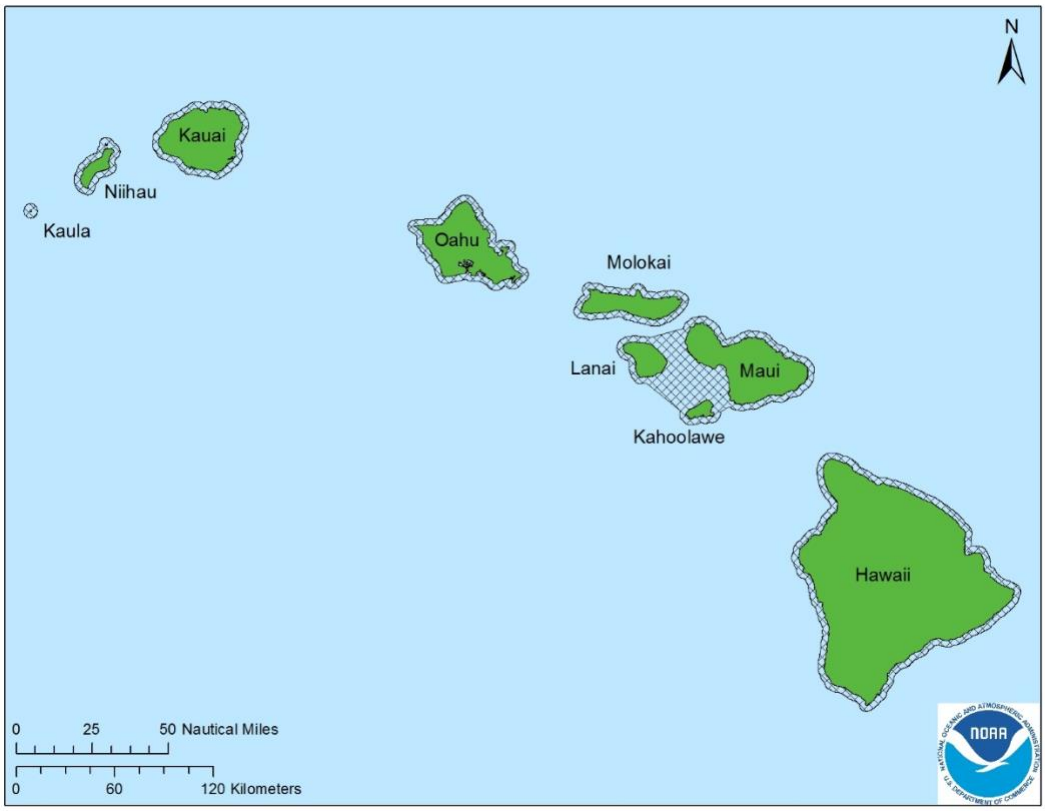

Figure 1: Boundary for geographic scope

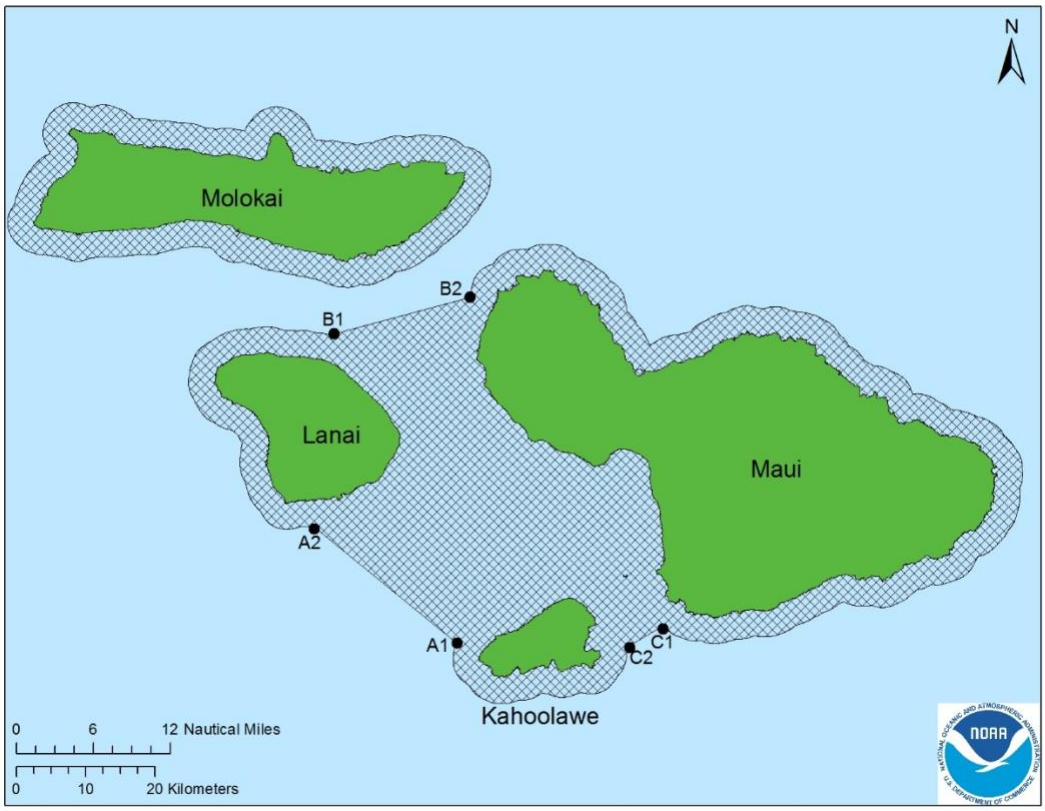

Figure 2: Geographic scope - designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe

Table 2: Coordinates for the extent of the designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe

Line Segment Between Islands	Label	Latitude	Longitude
Kahoʻolawe and Lānaʻi	A1	20° 32’ 51” N	156° 43’ 50”W
	A2	20° 42’ 04” N	156° 55’ 34”W
Lānaʻi and Maui	B1	20° 51’ 01” N	156° 54’ 00”W
	B2	20° 59’ 48” N	156° 42’ 28”W
Maui and Kahoʻolawe	C1	20° 33’ 55” N	156° 26’ 43”W
	C2	20° 32’ 15” N	156° 29’ 51”W

2.1.4 Exceptions to Prohibitions

Alternatives that identify prohibitions on activities or closures for specific sites would apply to motorized, non-motorized and self-propelled vessels, and swimmers. However, throughout the NEPA scoping period, several activities were identified that are not dolphin-directed, limit a private landowner’s ability to access their property, put lives or vessels at risk, or restrict a

community from engaging in important cultural activities. Due to these concerns, NMFS identified several exceptions to various prohibitions because the likelihood of these activities having long-term impacts on spinner dolphins is low and the potential adverse effects involved in regulating these activities may be avoided.

NMFS identified the following exceptions to the prohibitions. Each exception is also specifically discussed under the relevant alternatives and applicability to each alternative is identified in Table 4.

- Any person who inadvertently comes within 50 yards of a Hawaiian spinner dolphin or is approached by a spinner dolphin, provided the person makes no effort to engage or pursue the animal and takes immediate steps to move away from the animal;
- Any vessel that is underway and is approached by a spinner dolphin, provided the vessel continues normal navigation and makes no effort to engage or pursue the animal;
- Any vessel transiting to or from a port, harbor or in a restricted channel when a 50 yard distance will not allow the vessel to maintain safe navigation;
- Vessel operations necessary to avoid an imminent and serious threat to a person or vessel;
- Any vessel that is anchored and approached by a spinner dolphin, provided they do not make any effort to engage or pursue the animal(s);
- Activities authorized through a permit or authorization issued by the NMFS to take spinner dolphins; and
- Federal, State, or local government vessels, aircraft, personnel, and assets when necessary in the course of performing official duties.
- Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

In addition to the above exceptions, the following exceptions would apply to both alternatives 4 and 5:

- Vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure;
- Vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure; and
- Outrigger canoes used for traditional subsistence fishing with harvested resources intended for personal, family, or community consumption or traditional use.

The exception related to vessels transiting to and from harbors is necessary to allow traffic for ongoing recreational and commercial activities. Near harbor entrances and restricted channels, approaching spinner dolphins within 50 yards may be unavoidable in some cases. Several exceptions accommodate the needs of local landowners and ongoing, traditional activities within the time-area closures. These exceptions, which include outrigger canoe races, access to privately owned land adjacent to time-area closures, and subsistence fishing are activities that are expected to cause minimal impact to the dolphins and are not expected to individually or cumulatively casue disruptive impacts to spinners. The exception of government vessels, aircraft,

personnel, and assets avoids disruption of ongoing government business, including enforcement activities and those critical to national security. The exception for vessels operating pursuant to a NMFS permit or other authorization is considered necessary to allow management and conservation activities to continue, and terms and conditions associated with the permit or authorization reduce the potential impacts to dolphins. The exception of vessels being used to avoid an imminent and serious threat to a person or vessel is necessary for safety of human life and property.

The burden would be on the vessel operator or swimmer to prove the exception applies, and users who may be exempt from this regulation would still be subject to other MMPA prohibitions.

2.2 Alternative 1 – No Action

Under the No Action Alternative, which the agency is required to evaluate per the CEQ regulations, NFMS would take no additional regulatory action to enhance protections for Hawaiian spinner dolphins from forms of take that include harassment or intentional disturbance during important resting periods. Under this alternative, current prohibitions established under the MMPA regarding take of all marine mammals, including spinner dolphins, would continue to apply (see section 1.3.1). In addition, NMFS would continue to promote responsible wildlife viewing through regional guidelines (see section 1.3.2) and the Dolphin SMART program, which includes a set of voluntary guidelines designed to help boaters avoid harassment (see section 1.3.3).

2.3 Alternative 2 – Swim-With Regulation

Under Alternative 2, NMFS would prohibit swimming within 50 yards (approximately 46 m) of Hawaiian spinner dolphins, including attempting to swim towards spinner dolphins. Swim-with activities are associated with disruption to the behavioral patterns of cetaceans targeted by people wanting interactions with them; in the case of Hawaiian spinner dolphins, this includes interruptions to daily resting, nurturing of young, and socializing (see review by Samuels *et al.* 2000). This rule is applicable within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe.

Prohibitions would include swimming activities that are spinner dolphin-directed at any time and from any platform, such as from shore; a commercial vessel, kayak, or stand up paddleboard (SUP); or any other means. This measure is aimed at preventing human activities that disturb spinner dolphins during the daytime, which includes closely swimming or attempting to closely swim with spinner dolphins. It is consistent with the current regional viewing guidelines and the Dolphin SMART program criteria, which discourages attempting to swim with, pet, touch or elicit a reaction from the animals.

NMFS recognizes that circumstances may occur where swimmers inadvertently find themselves within 50 yards of a spinner dolphin; an exception is provided for this prohibition provided the swimmer makes no effort to engage or pursue the animals, and takes immediate steps to move away from the animals. Additionally, an exception exists for persons engaged in an activity that is authorized through a permit or authorization issued by the National Marine Fisheries Service to take spinner dolphins, because some research and enhancement activities may require close approach of Hawaiian spinner dolphins (*e.g.*, health assessment work) (see Table 4).

2.4 Alternative 3 –Swim-With and Approach Regulations

Under Alternative 3 NMFS would prohibit swimming with and approaching Hawaiian spinner dolphins within a specified distance; two distance options Alternative 3(A) and Alternative 3(B) are provided for evaluation below.

2.4.1 Alternative 3(A) – Swim-With and 50 Yard Approach Regulations

Under Alternative 3(A), NMFS would prohibit the following activities:

- Approaching or remaining within 50 yards of a Hawaiian spinner dolphin by any means;
- Swimming within 50 yards of a Hawaiian spinner dolphin;
- Causing a vessel, person, or other object to approach or remain within 50 yards of a Hawaiian spinner dolphin; or
- Intercepting or placing a vessel, person, or other object on the path of a spinner dolphin so that the dolphin approaches within 50 yards of the vessel, person, or object.

The prohibitions apply to all forms of swimming-with and approach in water and air. Forms of approaching spinner dolphins include, but are not limited to, swimming, operating a manned or unmanned motorized, non-motorized, self-propelled, human-powered, or submersible vessel; operating an unmanned aircraft system (UAS) or drone; and swimming at the water surface or underwater (i.e., SCUBA or free diving).

This alternative prohibits a range of human activities that occur in close proximity to spinner dolphins including swimming with, touching or attempting to touch, corralling or herding into small areas, and leap frogging (placing a vessel or person in the path of an oncoming spinner dolphin so that the dolphin surfaces within 50 yards of the vessel or person), all of which have the potential to disturb Hawaiian spinner dolphins in the wild.

Similar to the minimum approach rules for humpback whales in Hawai‘i (50 CFR 224.103(a)) and Alaska (50 CFR 224.103(b)) and for right whales in the North Atlantic (50 CFR 224.103(c)), the approach limit accommodates a reasonable level of spinner dolphin viewing while minimizing potential detrimental impacts from close human interactions. This alternative is consistent with Dolphin SMART program criteria and NMFS guidelines, which advise boaters to stay 50 yards away from marine mammals to prevent disturbance. This rule is applicable within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lāna‘i, Maui, and Kaho‘olawe.

NMFS recognizes that circumstances may occur where vessels or swimmers find themselves within 50 yards of a spinner dolphin and we listed a total of eight (8) exceptions to this rule. In the proposed rule, we listed six (6) exceptions to this rule that are included in the final rule:

(1) Any person who inadvertently comes within 50 yards of a Hawaiian spinner dolphin or is approached by a spinner dolphin, provided the person makes no effort to engage or pursue the animal and takes immediate steps to move away from the animal;
(2) Any vessel that is underway and is approached by a Hawaiian spinner dolphin, provided the vessel continues normal navigation and makes no effort to engage or pursue the animal. For purposes of this exception, a vessel is defined as a watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water (1 U.S. Code § 3); a vessel is underway if it is not at anchor, made fast to the shore, or aground;
(3) Any vessel transiting to or from a port, harbor, or in a restricted channel when a 50 yard distance will not allow the vessel to maintain safe navigation;
(4) Vessel operations necessary to avoid an imminent and serious threat to a person or vessel;
(5) Activities authorized through a permit or authorization issued by the National Marine Fisheries Service to take Hawaiian spinner dolphins; and
(6) Federal, State, or local government vessels, aircraft, personnel, and assets when necessary in the course of performing official duties.

Upon review of the comments received during the public comment period, we decided to add two exceptions for:

(1) Any vessel that is anchored or aground and is approached by a Hawaiian spinner dolphin, provided the vessel makes no effort to engage or pursue the animal; and
(2) Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

2.4.2 Alternative 3(B) – Swim-With and 100 Yard Approach Regulation

Under Alternative 3(B), NMFS would prohibit swimming with and approaching a Hawaiian spinner dolphin within 100 yards (approximately 92 m) by any means. The prohibitions apply to all forms of swimming-with and approach in water and air. Forms of approaching spinner dolphins include, but are not limited to, swimming, operating a manned or unmanned motorized, non-motorized, self-propelled, human-powered, or submersible vessel; operating an unmanned aircraft system (UAS) or drone; and swimming at the water surface or underwater (i.e., SCUBA or free diving). This also includes approach by interception (*e.g.*, leap-frogging, or placing a vessel or person in the path of an oncoming spinner dolphin so that the dolphin surfaces within 100 yards of the vessel or person).

Similar to Alternative 3(A), this Alternative would prohibit the same range of human activities that occur in close proximity to Hawaiian spinner dolphins discussed above. However, the increased distance is expected to provide spinner dolphins more protections from disturbance. The exceptions described above under Alternative 3(A) also apply to this option, when vessels or swimmers are within 100 yards of the dolphins.

2.5 Alternative 4 – Mandatory Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 4 would prohibit people from using five mandatory time-area closures (*i.e.*, closures that are required by law) during specific resting times and prohibit swimming with and approaching Hawaiian spinner dolphins within a minimum prescribed distance. Under Alternative 4, the proposed action would create the following two components within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe:

1. **Mandatory time-area closure component:** Implement mandatory time-area closures in five selected essential daytime habitats. NMFS would close a small subset of Hawaiian spinner dolphin essential daytime habitats every day from 6 AM to 3 PM. The areas chosen for mandatory time-area closures are Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay (Hoʻokena), and Makako Bay on the Island of Hawaiʻi; and La Perouse Bay on the Island of Maui.
2. **Swim-with and approach regulations component:** Implement swim-with and minimum distance approach regulations. NMFS would prohibit approaching Hawaiian spinner dolphins within a minimum prescribed distance (between 50 and 100 yards). Similar to Alternatives 3(A) and 3(B) swim-with and minimum approach regulations would prevent a range of human activities that occur in close proximity to spinner dolphins that result in take.

NMFS identified the essential daytime habitats chosen for time-area closures through the procedures described in section 2.7 below. At all locations, activities occurring in the intertidal zone, such as shore-based fishing and subsistence gathering, are not prohibited and will be able to continue during any time of day. The exceptions described for Alternative 3(A) in section 2.4.1 would apply to the approach regulations of this Alternative; in addition, because the following activities are temporary and are not expected to result in long-term impacts to the fitness of spinner dolphins, the following exceptions would apply to the time-area closures:

- Vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure;
- Vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure; and
- Outrigger canoes used for traditional subsistence fishing with harvested resources intended for personal, family, or community consumption or traditional use.

2.6 Alternative 5 – Voluntary Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 5 would create five voluntary time-area closures (*i.e.*, closures that are required by law) and prohibit swimming with and approaching Hawaiian spinner dolphins within a minimum

prescribed distance. Under Alternative 5, the proposed action would create the following two components within 2 nm (3.7 km) of each of the MHI and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe:

1. **Voluntary time-are closure component:** Implement voluntary time-area closures in five selected essential daytime habitats. NMFS would close a small subset of Hawaiian spinner dolphin essential daytime habitats every day from 6 AM to 3 PM. The areas chosen for mandatory time-area closures are Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay (Hoʻokena), and Makako Bay on the Island of Hawaiʻi; and La Perouse Bay on the Island of Maui. When a voluntary closure is effective, persons and vessels have a moral but not legal responsibility to comply with its terms. A violation does not result in sanctions.
2. **Swim-with and approach regulations component:** Implement swim-with and minimum distance approach regulations. NMFS would prohibit swimming with and approaching Hawaiian spinner dolphins within a minimum prescribed distance (between 50 and 100 yards). Similar to Alternatives 3(A) and 3(B) swim-with and minimum approach regulations would prevent a range of human activities that occur in close proximity to spinner dolphins that result in take.

NMFS identified the essential daytime habitats chosen for time-area closures through the procedures described in section 2.7 below. At all locations, activities occurring in the intertidal zone, such as shore-based fishing and subsistence gathering, will be able to continue during any time of day. The exceptions described for Alternative 3(A) in section 2.4.1 would apply to the approach regulations of this Alternative. Regulatory exceptions need not be prescribed for a voluntary management measure; however, NMFS expects that, similar to the mandatory time-area closures, a need to enter or transit a voluntary time-area may arise. Accordingly, the exceptions identified for the mandatory time-area closures also apply to voluntary time-area closures.

2.7 Time-Area Closures Considered Under Alternatives 4 and 5

2.7.1 Method for Identifying Closure Areas within Hawaiian Spinner Dolphin Essential Daytime Habitats

To address the practical aspects of available resources and effectively implement management with limited resources under Alternative 4 and 5, NMFS selected five areas for closure. NMFS identified these areas using a step-down process in which NMFS identified important habitats in need of enhanced protection and then considered additional criteria that may promote or obstruct the effectiveness of the closure (see Appendix A, “Selection Process for Time-Area Closures”). As proposed, sites identified represent essential daytime habitats where human activities are largely Hawaiian spinner dolphin-directed and where regulatory measures can be balanced most effectively with human ocean use to enhance protections for these dolphins. Once NMFS identified the sites, additional consideration was given to each site to delineate the closure area. NMFS delineated the proposed closure areas in a way that would enhance protections for the spinner dolphins' core resting areas, including frequently used sand bottom areas, while taking into consideration stakeholder needs, such as leaving a narrow swim lane close to shore if the

dolphins are less likely to rest in that area. The methods NMFS used to identify and then delineate the areas identified in Alternative 4 and 5 were as follows.

1. NMFS identified known Hawaiian spinner dolphin essential daytime habitats based on current knowledge by doing the following:

- Reviewing scientific literature regarding Hawaiian spinner dolphin use of areas throughout MHI
- Requesting and reviewing information from scientists working in the MHI
- Coordinating with State of Hawai‘i and current stakeholders to identify any additional spinner dolphin resting areas
- Coordinating with stakeholders for additional information
- Reviewing scoping comments for additional information

NMFS identified 67 areas during this process, however not all areas may be Hawaiian spinner dolphin essential daytime habitats. This information is found in Appendix A.

2. NMFS identified essential daytime habitats where people most often interact or attempt to interact with Hawaiian spinner dolphins by doing the following:

- Reviewing scientific literature for information regarding Hawaiian spinner dolphin disturbance
- Coordinating with NOAA OLE to identify areas where spinner dolphin disturbance has been recorded, reported or observed
- Coordinating with the State of Hawai‘i to identify additional areas where disturbance to spinner dolphins may occur
- Coordinating with other concerned stakeholders for additional information on dolphin-human interactions
- Reviewing scoping comments for additional information

From those 67 areas, NMFS identified 12 areas as essential daytime habitats in which Hawaiian spinner dolphins exhibit signs of chronic disturbance and intense dolphin-directed activities. This information is found in Appendix A.

3. NMFS identified areas (from those identified in the second step) where closures are likely to be most effective based on the following criteria:

- Environmental conditions support a discrete closure site for resting Hawaiian spinner dolphins
- Enforcement is logistically feasible based on resources and accessibility
- The site may be easily accessible for scientific monitoring purposes
- Closure of the area does not restrict major harbors, Ocean Recreation Management Areas (ORMAs) or transit zones
- Nearby areas are still accessible for activities that are not spinner dolphin-directed

This information is found in Appendix A.

4. NMFS delineated closures to maximize protection of core Hawaiian spinner dolphin daytime habitat and minimize restrictions to ocean users.
NMFS considered what is known about how Hawaiian spinner dolphins use an area for their resting behaviors, as well as how people use the area for activities that are not spinner dolphin-directed. If closed areas could ensure spinner dolphin protection and still allow for human use of the area that is not spinner dolphin-directed, then NMFS delineated the closed area to accommodate these human uses.

2.7.2 Areas Considered for Time-Area Closures

Based on the methods and factors identified in 2.7 above, NMFS identified the following Hawaiian spinner dolphin essential daytime habitat sites to be considered for time-area closures on the islands of Hawai‘i and Maui (reviewed in more detail in Appendix A):

Hawai‘i Island

- Kealakekua Bay
- Hōnaunau Bay
- Kauhakō Bay
- Makako Bay

Maui

- La Perouse Bay

In the Notice of Intent to prepare an Environmental Impact Statement (71 FR 57923, October 2, 2006), NMFS provided an example of potential closure times from 9 AM to 2 PM. However, after reviewing available literature, NMFS has considered closure times under Alternative 4 and 5 from 6 AM to 3 PM. Historically, Hawaiian spinner dolphins would generally enter the bays in the MHI shortly after dawn, generally between 6 AM and 9:50 AM (Norris and Dohl 1980), and rest and inhabit the bay for the majority of the day with a peak in activity between 7 AM and 9 AM as they descend into rest (Östman-Lind 2009). They would then exit the bay to feed in the late afternoon or early evening, usually by 6 PM (Benoit-Bird 2003), but generally between 3 PM and 7 PM (Danil *et al*. 2005). Depending on the season, the average time spent at a resting bay off the Kona coast was between 5.1 and 9 hours (Norris *et al*. 1994). Recent research indicates that Hawaiian spinner dolphins spend the majority of time resting between 10:00 AM and 2 PM (Tyne *et al*., 2014). The closure times considered not only encompass those hours, but also attempt to reflect those of historic resting periods before human interactions may have been a factor in the dolphins' resting habits. Historic spinner dolphin resting times ranged throughout the day from shortly after dawn (between 6 AM and 9:50 AM) to nearly dusk (Norris and Dohl, 1980). NMFS selected the closure time of 6 AM to 3 PM for the following reasons:

- Encourage Hawaiian spinner dolphin resting patterns similar to those that occurred in the past (before the influence of spinner dolphin-directed tourism)
- Encompass the dolphins' historic resting hours as closely as possible
- Discourage human activities that may deter spinner dolphins from entering the bays in the early morning hours
- Minimize disruptions to human activities at the sites as much as possible

NMFS plans to place informational signs on shore at all sites to educate the public about the closure areas. The signs will be located to maximize visibility, while still accommodating cost and environmental constraints. The following sections describe the area and time of each Hawaiian spinner dolphin essential daytime habitat site considered for closure in more detail. The map seen below (Figure 3) provides an overall view of the locations of the four closure areas considered on Hawai‘i Island for reference.

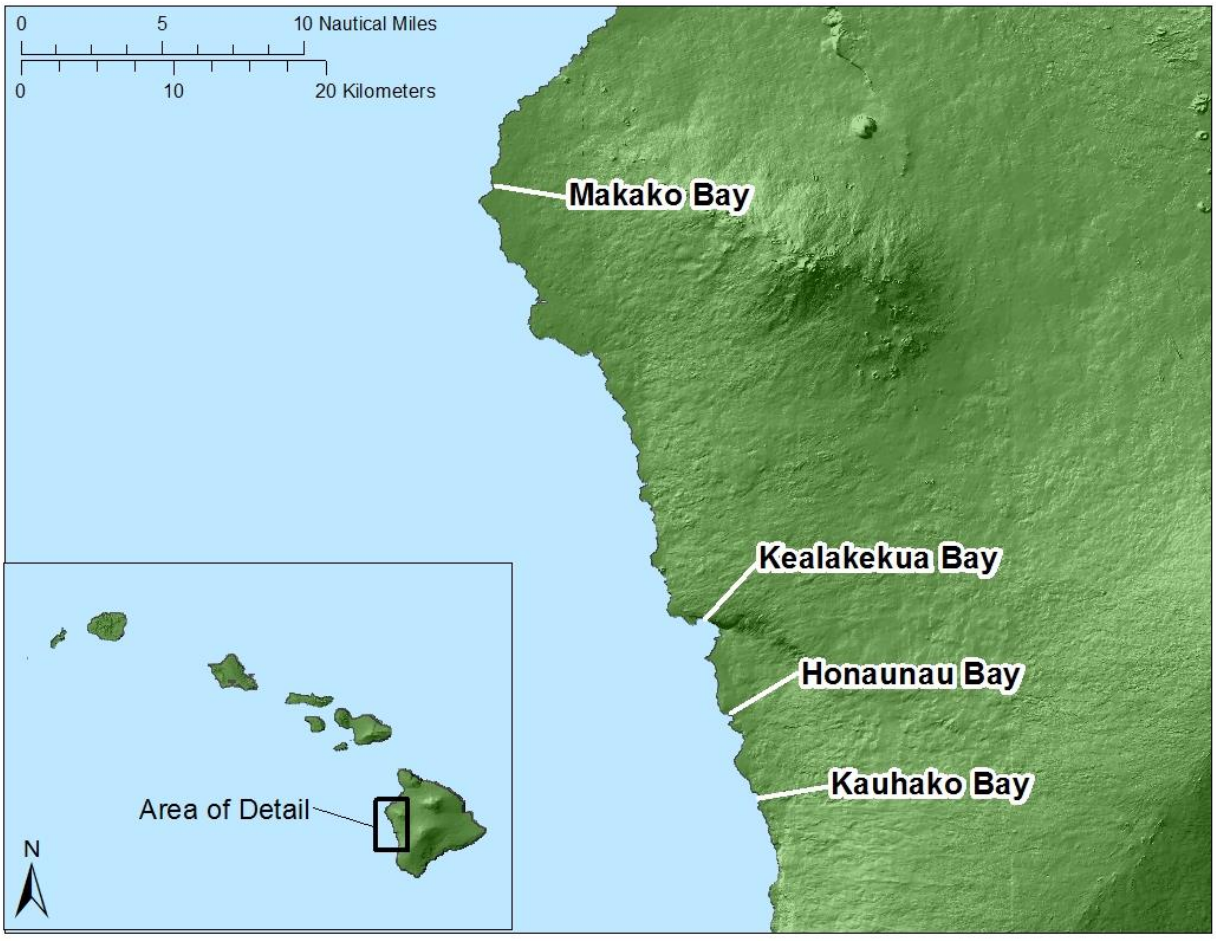

Figure 3: Hawai‘i Island – Sites with Areas Considered for Time-Area Closure

2.7.2.1 Kealakekua Bay

The red box between points A, B, C, and D shown in Figure 4 illustrates the closure area considered for Kealakekua Bay. Approximate segment lengths A-B and C-D are 1,005 m (0.62

mi), and segment lengths A-D and B-C are 220 m (0.14 miles). The total area of closure is 0.09 mi^2. This area would be closed from 6 AM until 3 PM, while the rest of the bay would remain open for other ocean uses such as swimming, kayaking, snorkeling, and dive activities. The County of Hawai‘i identifies two public access points on Boulder Beach and Nāpō‘opo‘o Landing at Kealakekua Bay (http://www.hawaiicounty.gov/pl-s-kona-map2); both points would remain open for access. The closure area would be delineated by means of six marker buoys — one located at each corner and one located at the middle of each of the lengthwise boundaries. The closure encompasses approximately 0.082 mi^2 (0.213 km^2) of resting habitat used by Hawaiian spinner dolphins. The white line on the map shows the route used by kayakers to access the Captain Cook Monument at Ka‘awaloa from Nāpō‘opo‘o Pier (the route is located outside of the area closure).

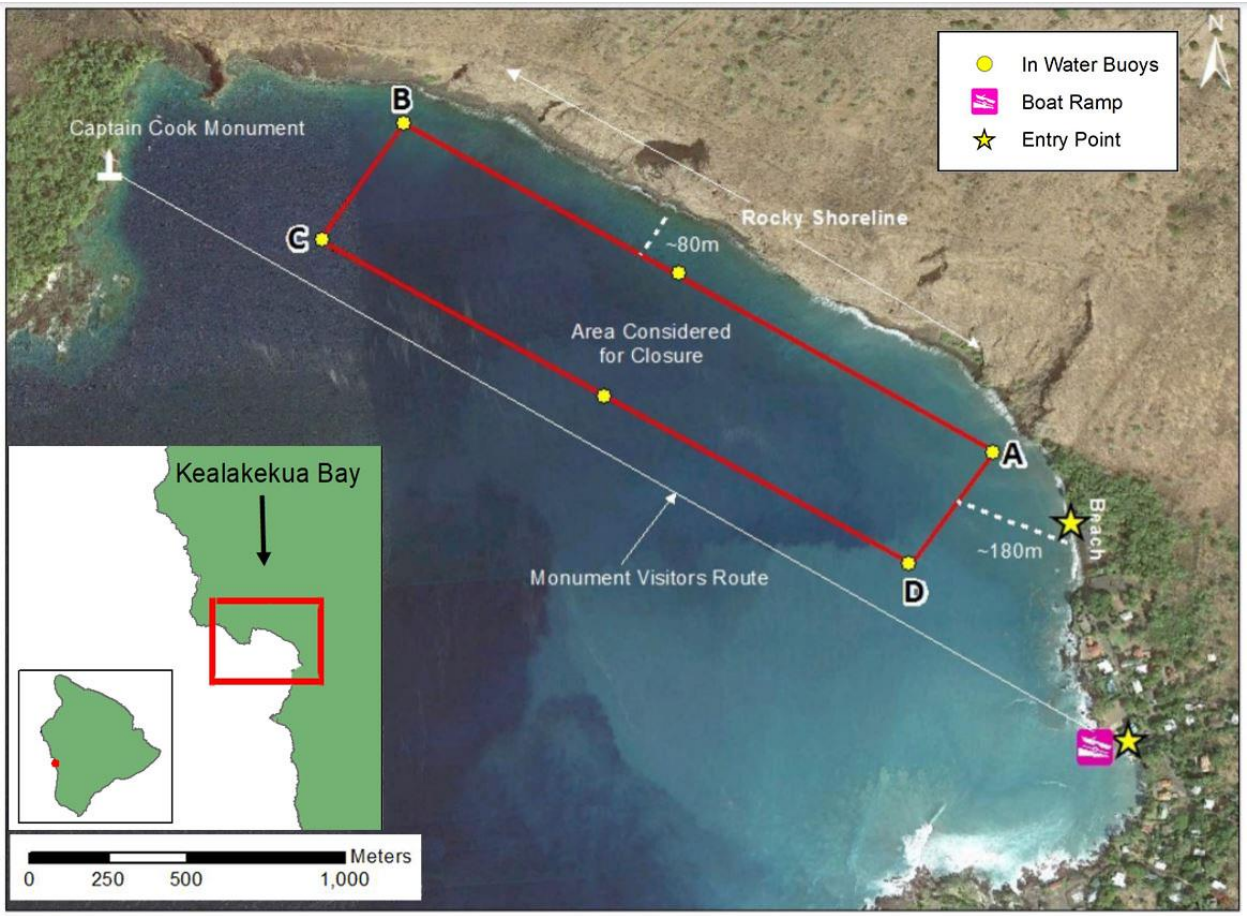

Figure 4: Kealakekua Bay Area Considered for Closure

Approximate Latitude/Longitude Coordinates

A – 19°28’37”N, 155°55’15”W
B – 19°28’54”N, 155°55’44”W
C – 19°28’48”N, 155°55’49”W
D – 19°28’32”N, 155°55’19”W

2.7.2.2 Hōnaunau Bay

The red lines between points A, B and C in Figure 5 illustrate the marine boundaries for the closure area considered for Hōnaunau Bay; the shoreline boundary is at the mean lower low water line between points A and C. The approximate segment length of A–B is 440 m (0.27 mi) and the segment length of B–C is 330 m (0.21 miles). Total area of closure is 0.04 mi^2. The closure site at Hōnaunau would be delineated by means of a single marker buoy and be aligned with site line markers on shore at points A and C (Figure 3) to minimize impacts to known Native Hawaiian cultural sites while also accomplishing the objective of the regulation. The closure encompasses approximately 0.04 mi^2 (0.093 km^2) of resting habitat used by Hawaiian spinner dolphins. The County of Hawai'i identifies the Hōnaunau Bay boat ramp as a public access area (http://www.hawaiicounty.gov/pl-s-kona-map3). The boat ramp and the popular access point for swimming and snorkeling known as Two-Step are located outside of the closure area and remain open for everyday use.

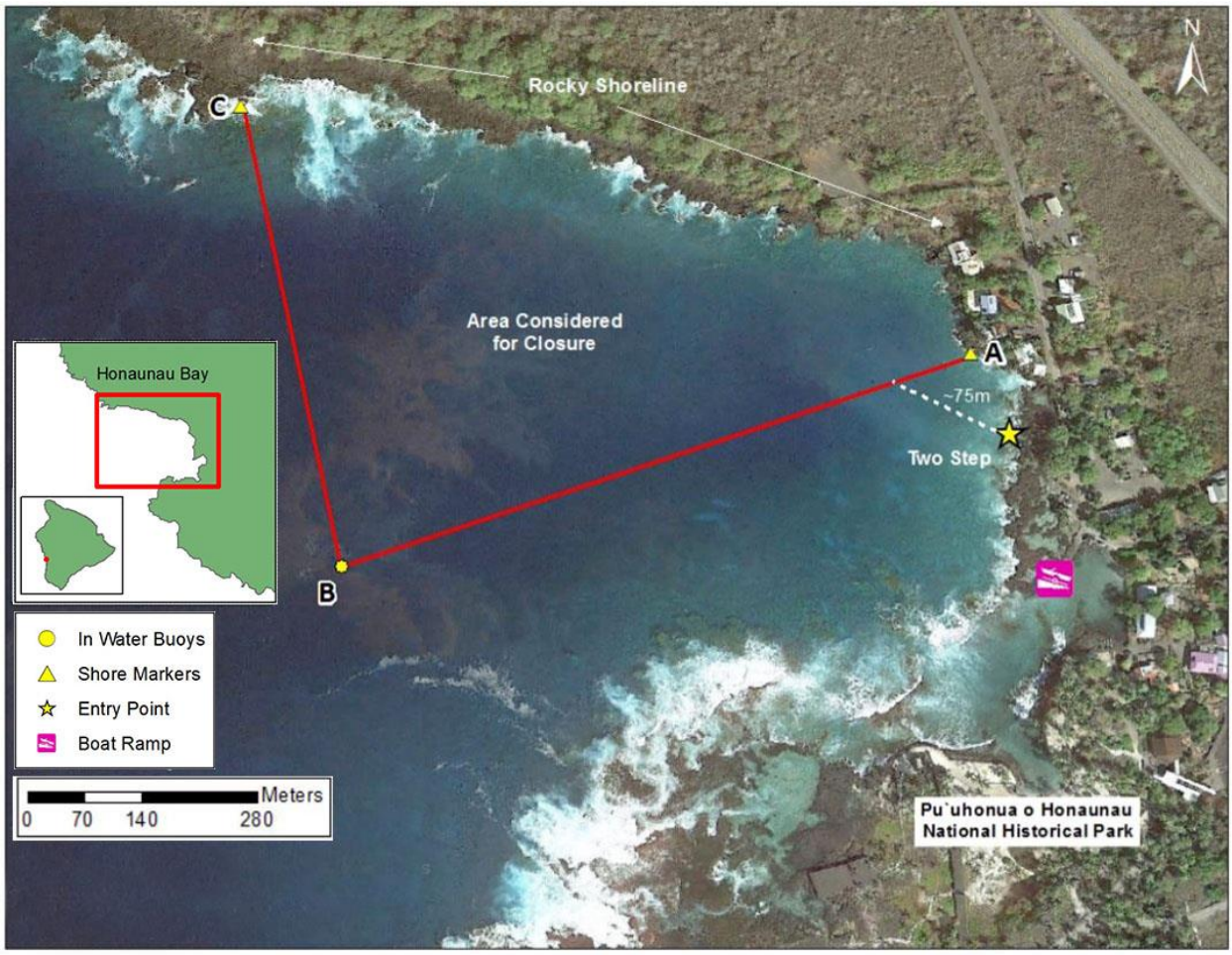

Figure 5: Hōnaunau Bay Area Considered for Closure

Approximate Latitude/Longitude Coordinates

A – 19°25'27"N, 155°54'41"W
B – 19°25'22"N, 155°54'57"W
C – 19°25'31"N, 155°54'58"W

2.7.2.3 Kauhakō Bay

The red box between points A, B, C, and D in Figure 6 illustrate the marine boundaries for the closure area considered for Kauhakō Bay. The approximate segment length of A–B is 330 m (0.21 mi), and the segment length of B–C is 1,035 m (0.64 miles). The total area of closure is 0.07 mi^2. The County of Hawai‘i identifies Ho‘okena Beach Park as a public access point for this area (http://www.hawaiicounty.gov/pl-s-kona-map3). The near-shore area located inshore of the line between points A and B is open for everyday use, including swimming, snorkeling and free diving. The site would be delineated by means of two in-water marker buoys at points A and B and would be aligned with site line markers on shore at points C and D. Two buoys placed along the outer boundary (line B–C) to delineate the closure area at this bay

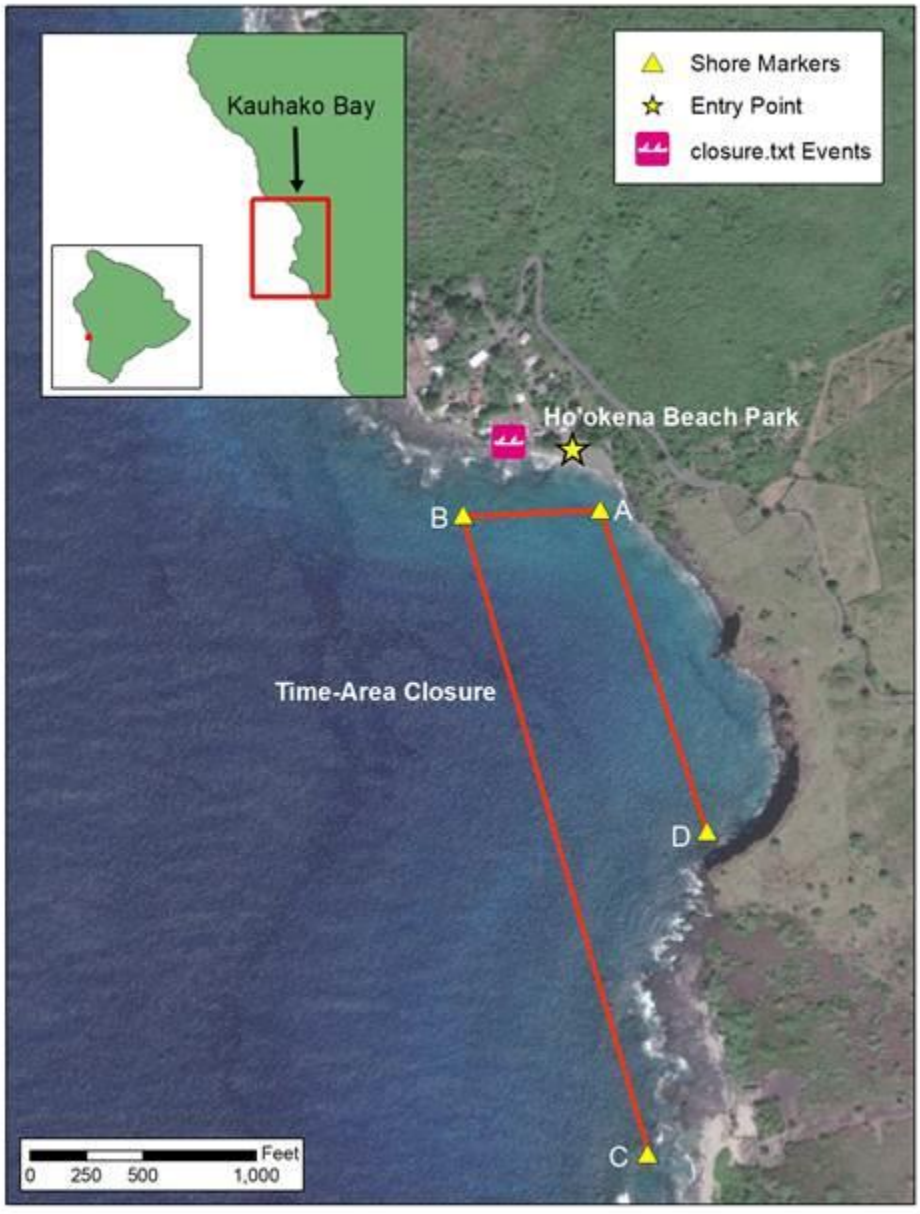

Figure 6: Kauhakō Bay Area Considered for Closure

Approximate Latitude/Longitude Coordinates

A – 19°22'44"N, 155°53'51"W
B – 19°22’44”N, 155°53’57”W
C – 19°22’16”N, 155°53’49”W
D – 19°22’30”N, 155°53’46”W

2.7.2.4 Makako Bay

The red lines between points A, B, C and D in Figure 7 illustrate the marine boundaries for the closure area considered for Makako Bay; the shoreline boundary is at the mean lower low water line between points A and D. The approximate segment length of A–B is 315 m (0.20 mi), the segment length of B–C is 758 m (0.47 miles) and the segment length of C–D is 372 m (0.23 mi). Total area of closure is 0.14 mi^2. Dive moorings on the north and south ends of the bay are not within the closure and would remain available for everyday use. NMFS would place two buoy markers at points B and C, aligned with site line markers on the shore at points A and D to delineate the closure area. The County of Hawai‘i does not identify any public access point for Makako Bay from the shore. The closest access point is just south at Wawaloli Beach, with another access point to the north at Keahole Point (http://www.hawaiicounty.gov/pl-n-kona-map2; http://www.hawaiicounty.gov/pl-n-kona-map1).

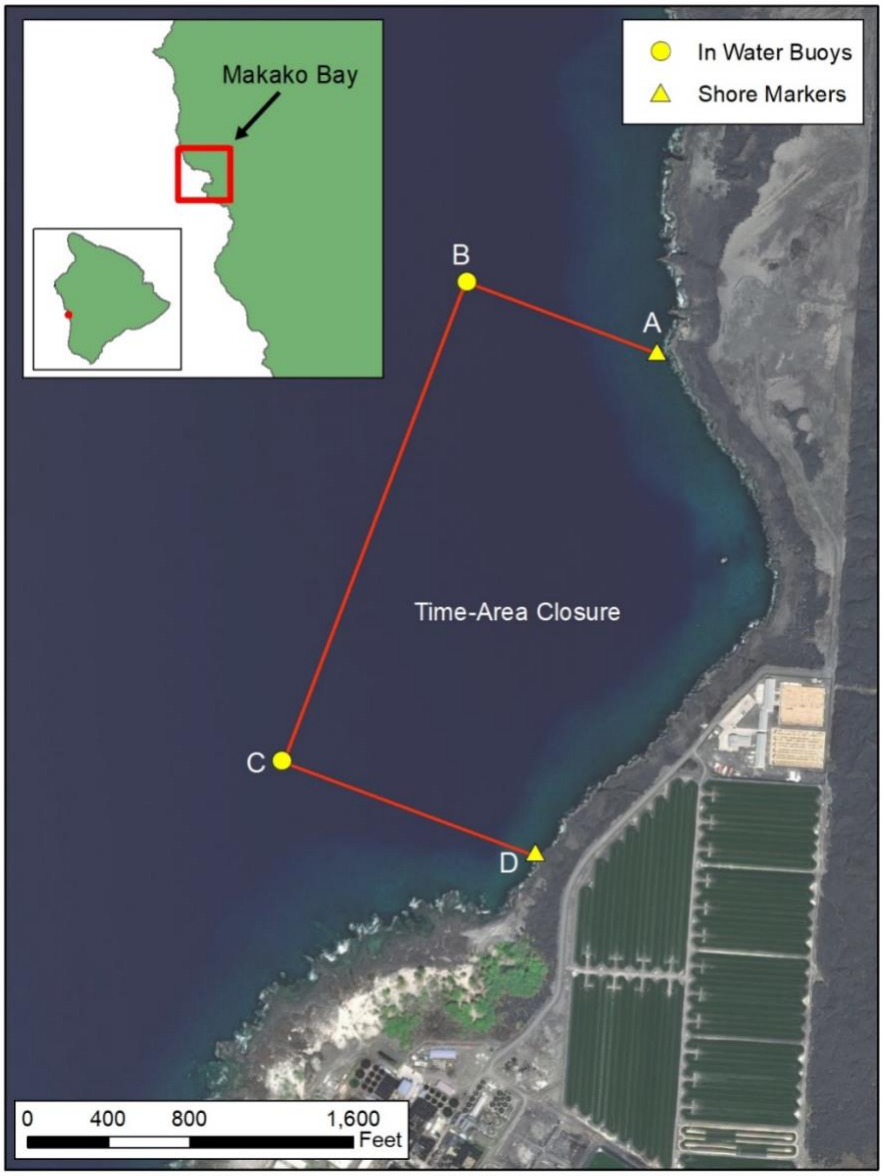

Figure 7: Makako Bay Area Considered for Closure

Approximate Latitude/Longitude Coordinates

A – 19°44’21”N, 156°3’16”W
B – 19°44’25”N, 156°3’26”W
C – 19°44’2”N, 156°3’36”W
D – 19°43’57”N, 156°3’23”W

2.7.2.5 La Perouse Bay

The red lines between points A and B and C and D in Figure 8 illustrate the marine boundaries for the closure area considered for La Perouse Bay. The approximate segment length of A–B is 1,340 m (0.83 mi), and the segment length of C–D is 1,515 m (0.94 mi). Total area of closure is

0.32 mi^2. Maui County identifies La Perouse Bay as a public access point for this area. The area inshore of the line between A and B, which includes this access point, would remain open for everyday uses, such as surfing, snorkeling and free diving. NMFS would place in-water marker buoys to delineate the boundary lines at points A, B, C, and D. Two additional in-water marker buoys along the offshore boundary line (line C–D) would delineate the outer closure boundary.

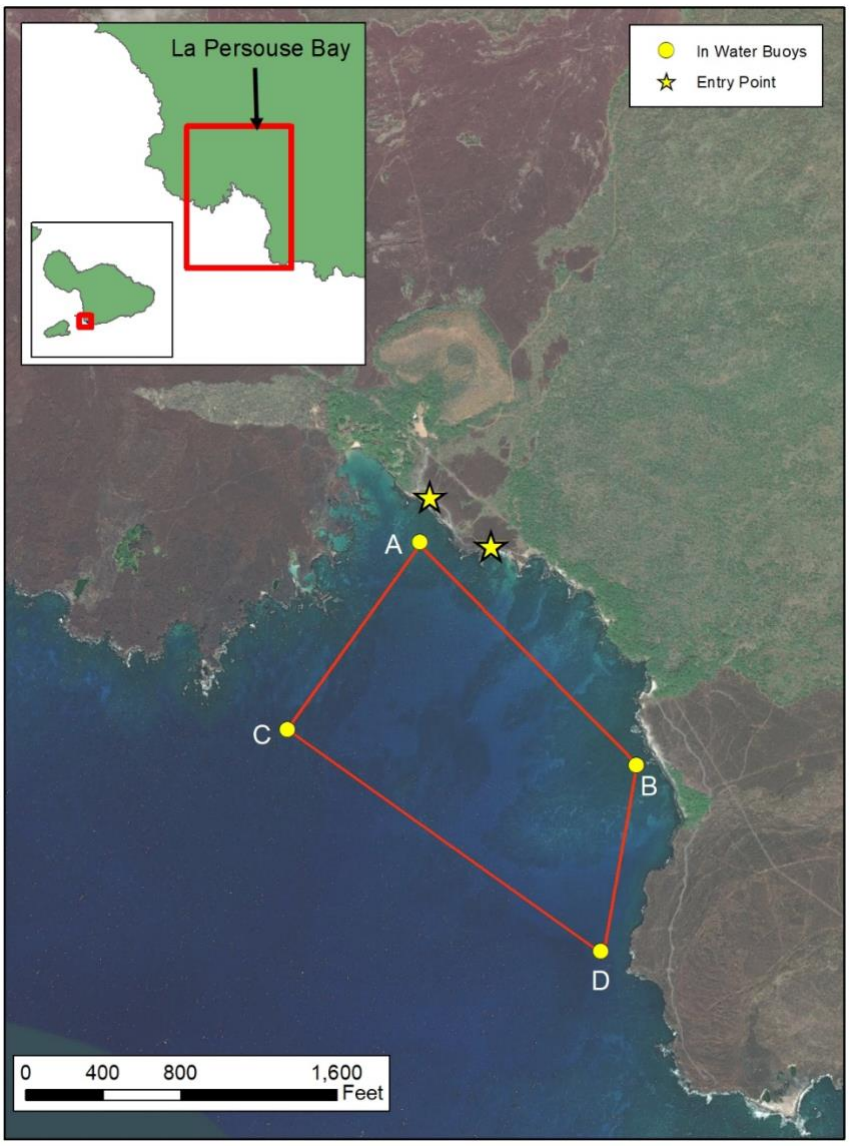

Figure 8: La Perouse Bay Area Considered for Closure

Approximate Latitude/Longitude Coordinates

A – 20°35’53”N, 156°25’12”W
B – 20°35’31”N, 156°24’50”W
C – 20°35’35”N, 156°25’26”W
D – 20°35’13”N, 156°24’54”W

2.7.3 Exceptions/Allowances for Time-Area Closures Under Alternatives 4 and 5

NMFS expects that circumstances presenting a need to enter or transit a time-area closure would be the same under Alternatives 4 and 5. Regulatory exceptions described in this section for mandatory time area closures (under Alternative 4) also describe appropriate allowances to enter voluntary time-area closures (under Alternative 5). All closures would allow exceptions for Federal, State, and local government vessels, aircraft, personnel, and assets; vessels or persons engaged in an activity that is authorized through a permit or authorization issued by the National Marine Fisheries Service to take spinner dolphins; and vessel operations necessary to avoid an imminent and serious threat to a person or vessel. In addition the following exceptions, which do not occur at an intensity or frequency that is likely to harass Hawaiian spinner dolphins, would also apply to the time-area closure prohibitions:

- Vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure;
- Vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure; and
- Outrigger canoes used for traditional subsistence fishing with harvested resources intended for personal, family, or community consumption or traditional use.

2.7.4 Signage

As described in the previous sections, NMFS will install signs at each site where possible to clearly inform the public of the closure areas and times, as well as the goals of the closures with regard to the need to enhance protection of Hawaiian spinner dolphins' essential daytime habitat. The signs' locations will be chosen to maximize visibility, thus increasing public awareness of the proposed closures. NMFS will supplement these signs with additional means to inform the public via media, tour operators, brochures and other outreach programs to enhance communication of the closures.

In addition to signs, site-line markers will be installed at specific areas on shore (outlined in discussions of the time-area closures for specific bays) to delineate the closure areas when the boundaries intersect with the shoreline. These markers will be brightly colored to be visible from a great distance to alert people of the closure boundary. Additionally, buoys will be marked to alert people in/on the water of the time and access restrictions for the areas.

2.7.5 Buoy Installation

NMFS will install buoys at each of the proposed closure sites to demarcate the restricted areas as described in section 2.7.1. Each buoy will meet the standards for U.S. Coast Guard regulatory buoys and will illustrate that people and vessels are prohibited from use of the areas between the hours designated under the selected alternative. These regulatory buoys will meet all applicable permitting requirements and standards established by the USCG, and all elements of the buoy system will be in accordance with the environmental conditions and in concert with one another

(see Appendix B). In addition, NMFS will obtain all necessary permits for the installation of signs.

Demarcation buoy systems consist of three parts: an anchoring system; a floating buoy at the surface; and attaching elements, such as line or chains. Sea-bottom characteristics dictate the type of anchor system used for mooring buoys. NMFS is considering the use of the following systems because they are most conducive to the sandy-bottom substrates found at the closure sites: the Manta Ray anchor system, the Helix system, and the traditional anchor/block system. NMFS will select the buoy anchoring system after taking into consideration the best available data on which type of buoy is most appropriate for each of the sites, the costs associated with each system, and any additional impacts identified.

The Manta Ray anchor is a utility pole anchoring system adapted for underwater use. This system embeds the anchor into the sea floor, allowing for secure positioning. The first Manta Ray underwater systems were installed in 1990 in Florida's Key Largo National Marine Sanctuary. The Manta Ray anchoring system can be used in mixed bottoms of clay, sand, gravel, broken bedrock, coral rubble and soft substrate. It consists of a utility anchor attached to an anchor rod that is driven under the sea bottom using a hydraulic underwater jackhammer or other conventional hydraulic equipment. A thimble eye nut is screwed into the end of the anchor rod for attachment of the buoy line (see Appendix B). Installation time varies with sea-bottom characteristics, but in most cases, the Manta Ray can be installed in less than 30 minutes, reducing time and labor costs (International PADI 2005) compared with other anchoring systems.

The Helix System is an embedment anchor installed using a hydraulic torque motor to screw the anchor into the substrate. It can be installed from a surface barge using drive tools to reach to the bottom or by a diver using an underwater torque motor and supported by a surface vessel. A 6–10 inch diameter helix is attached to a round or square shaft anchor inserted into the substrate, which is connected to the buoy line and buoy (see Appendix B). The installation process can be accomplished entirely from the surface if necessary. This system has the strongest holding power compared with the other anchoring systems, and is intended to withstand both upward and downward force (International PADI 2005).

The traditional anchor/block system consists of a mooring block of cast concrete, with metal rings set into the concrete attached to the anchor line (see Appendix B). This system works best in shallow mud, sand or gravel substrates. The weighted blocks keep these systems in place, but ocean movements (such as storm events) may cause some blocks to drag along the floor. Consequently, these traditional anchoring systems are not recommended for areas where block movement has the potential to cause severe damage to coral reefs or sea grass beds. However, at the proposed locations, this system is expected to only minimally impact the sandy-bottom habitat. These anchoring systems are not attached to the bottom; therefore, these blocks are placed on level bottoms to avoid shifting from their intended locations. Deployment of heavy blocks will require a stable workboat with adequate deck space. This design may require frequent inspections and maintenance as required under the Coast Guard permit.

Overall maintenance of these buoy systems will require regular monitoring and visual inspections at each site, including deploying divers into the water for general maintenance, such as replacement or repairs of any part of the system that may be weathered or worn. If unforeseen damages occur, such as the destruction of or displacement of buoys, NMFS will ensure that buoys are returned to the intended boundary position and will inspect for damage and replace buoys as necessary.

The maps for each location in section 2.7.2 show the approximate buoy and shore marker locations at each proposed closure area.

2.8 Summary of the Alternatives

Table 3 (below) summarizes the alternatives under consideration. Table 4 identifies the exceptions that apply to each alternative. NMFS evaluated all environmental impacts from the proposed actions separately, and those assessments are presented in Chapter 4.

Table 3: Summary of the Alternatives

Alternatives		Time in Effect	Area in effect	Prohibitions or Restrictions
1	**No Action**	24 hours	Worldwide - Subject to the jurisdictional limits of the MMPA	Current MMPA Prohibitions*
All Alternatives below also include Current MMPA Prohibitions				
2	**Swim-With Regulation**	24 hours	All waters within 2 NM of shore and including designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with Hawaiian spinner dolphins
3(A)	**Swim-With and 50 Yard Approach Regulations**	24 hours	All waters within 2 NM of shore and including designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or a spinner dolphin group within 50 yards
3(B)	**Swim-With and 100 Yard Approach Regulations**	24 hours	All waters within 2 NM of shore and including designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or a spinner dolphin group within 100 yards
4	**Five Mandatory Time-Area Closures and**	6 AM to 3 PM Daily	Delineated areas within five essential daytime habitats	All activities prohibited within closures from 6 AM to 3 PM
	Swim-With and Approach Regulations	24 hours	All waters within 2 NM of shore and including designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or a spinner dolphin group within a prescribed distance (either 50 or 100 yards)
5	**Five Voluntary Time-Area Closures and**	6 AM to 3 PM Daily	Delineated areas within five essential daytime habitats	Request no activities within closures from 6 AM to 3 PM
	Swim-With and Approach Regulations	24 hours	All waters within 2 NM of shore and including designated waters bounded by Lāna‘i, Maui, and Kaho‘olawe	Swimming with and approaching a Hawaiian spinner dolphin or a spinner dolphin group within a prescribed distance (either 50 or 100 yards)

***See section 1.3.1 Marine Mammal Protection Act: Statutory Requirements, Authorities, and Prohibitions for current MMPA prohibitions related to take.**

Table 4: Exceptions applicability to each Action Alternative

	Exceptions	Alternatives				
		2. Swim-With	3(A). Swim-With and 50 Yard Approach [Preferred]	3(B). Swim-With and 100 Yard Approach	4. Mandatory Closures and Swim-With and Approach	5. Voluntary Closures and Swim-With and Approach
1	Vessels that are underway and approached by a spinner dolphin, provided the vessel continues normal navigation *		x	x	x	x
2	People who inadvertently come within 50 yards of a Hawaiian spinner dolphin or are approached by a spinner dolphin, provided the person makes no effort to engage or pursue the animal *	x	x	x	x	x
3	Any vessel transiting to or from a port, harbor or in a restricted channel when a 50 yard distance will not allow the vessel to maintain safe navigation		x	x	x	x
4	Federal, State, or local government vessels, aircraft, personnel, and assets when necessary in the course of performing official duties		x	x	x	x
5	Activities authorized through a permit or authorization issued by the NMFS to take spinner dolphins	x	x	x	x	x
6	Vessel operations necessary to avoid an imminent and serious threat to a person or vessel		x	x	x	x
7	Vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure				x	**
8	Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).	x	x	x	x	x
9	Vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure				x	**
10	Vessels that transit straight through the time-area closure for the purpose of traditional subsistence fishing*				x	**

11	Vessels that are anchored and approached by a spinner dolphin, provided they make no effort to engage or pursue the animal		x	x	x	x

Note: *exceptions are abbreviated see section 2.1.1.2 for full descriptions.
**Exceptions are not necessary for voluntary measures, but describe activities/allowances that may be appropriate.

2.9 Alternatives Considered but Eliminated from Detailed Analysis

2.9.1 Increased Enforcement of Current Prohibitions

NMFS considered and eliminated from further analysis the alternative of increasing the enforcement of current MMPA prohibitions. Increased enforcement activity under the existing regulatory regime is not expected to prevent close, concentrated, and chronic viewing pressure that has the potential for long-term disruptive impacts to the health and fitness of spinner dolphins, and therefore does not meet the purpose and need of the action. Although increased enforcement action against observed violations may result in additional penalties and can modify individual behavior on a case-by-case basis; however, disturbances to spinner dolphin populations cannot be prevented so long as chronic and concentrated viewing practices continue. Additionally, by identifying human activities that result in take of Hawaiian spinner dolphins that include harassment or other forms of disturbance this rule addresses current issues in enforcement that arise from public misunderstanding of the activities that constitute harassment under the MMPA.

2.9.2 Permit System

NMFS considered the alternative of licensing and permitting of commercial tour operators and eliminated it from further analysis because it would require a large infrastructure to administer, monitor, and enforce. Importantly, a permitting system would not address chronic pressure from swimmers and recreational waters users, and therefore doesn't meet the purpose of the action. A uniform system that generally applies equally to everyone and reduces the cumulative effect of the disturbances occurring on the spinner dolphins meets the purpose of the action. A permitting system would also not resolve the threats from stakeholders other than tour operators (such as personal vessels and swimmers from the shore). Accordingly, this alternative would not meet the purpose and need of the action and was rejected from further consideration.

2.9.3 Outreach/Education Only

NMFS considered and eliminated from further analysis the alternative of outreach and education as the sole approach to preventing human disturbance to Hawaiian spinner dolphins. NMFS has used outreach and education efforts and the Dolphin SMART program to address responsible wildlife viewing in Hawai‘i, and found that voluntary conservation support to be insufficient to address the problem with intense dolphin-directed activities. While education and outreach will continue to be conducted in conjunction with any chosen regulatory alternative, this action by itself is not likely to result in a significant, immediate prevention of take, including harassment and disturbance to spinner dolphins.

2.9.4 Full Closure of All Identified Hawaiian Spinner Dolphin Daytime Habitats

NMFS considered and eliminated from further analysis the alternative of implementing a full closure of all NMFS-identified Hawaiian spinner dolphin essential daytime habitats to all human uses because implementing this alternative was not logistically feasible. Closures for this considered alternative would include all NMFS-identified spinner dolphin essential daytime habitats that are listed in Table 1, which would have prohibitive associated costs, and also have the potential to disrupt human activities that do not result in take, such as when spinner dolphins are not present. In addition, a full closure does not allow for the consideration of human activities such as economic, cultural, subsistence, and recreational use of these areas that do not occur at an intensity or frequency that may be expected to disrupt spinner dolphins.

2.9.5 Human and Vessel Activity Regulations with Time-Area Closures Based on the West Hawai'i Voluntary Standards for Marine Tourism

NMFS considered and eliminated from further analysis the alternative of regulations based upon the West Hawai'i Voluntary Standards for Marine Tourism (WHVS). With stakeholder input and consensus by a wide variety of Hawai'i Island community members, the Coral Reef Alliance (CORAL) developed the WHVS. In 2008, CORAL began working with members of the local community of the Kona Coast to develop voluntary standards for marine tourism activities. As part of this effort, the involved parties produced a set of standards for wildlife interactions, including interactions with Hawaiian spinner dolphins. They also formed a working group for this purpose, which consisted of representatives of local spinner dolphin tour companies, dive companies and kayak rental businesses, as well as representatives from Hawai'i DLNR, NMFS and the Hawaiian Islands Humpback Whale Sanctuary, among others. The process was completed in 2009 and the standards published online at the following website: http://www.coral.org/west_hawaii_standards.

The WHVS standards were created to apply to all wildlife viewing and interactions in West Hawai'i and includes viewing and interaction guidelines for marine mammals, including Hawaiian spinner dolphins, in section 4.6 of these standards, titled: Wildlife interactions with marine mammals unprotected by the Endangered Species Act (dolphins, pilot whales, toothed whales etc.) (WHVS 2009). Measures under this section of the document include educational information about prohibitions already outlined in the MMPA; detailed boating courtesy, etiquette, recommendations and safety measures around marine mammals and swimmers; and detailed human activities to avoid when viewing and interacting with marine mammals. In addition, in section 4.7, standards specific to spinner dolphins were put forth, including spinner dolphin exclusion areas at Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay and Makako Bay, where boat operators are strongly encouraged not to enter the areas between 9 AM and 3 PM. The areas identified in these four bays on the west coast of Hawai'i Island are slightly smaller than those areas identified in Alternatives 4 and 5.

While considering codifying these standards as mandatory regulations, NMFS noted that the measures addressed in the WHVS were narrowly focused on activities and areas only on the west coast of Hawai'i Island (although some of the standards could be adapted to apply to waters throughout the State of Hawai'i), and did not meet the criteria identified in section 2.1. The standards are mainly adapted for marine recreational providers (tour operators); therefore, most

measures do not convert well to all user groups and may not be easily understood by other resource users. In addition, the complexity of certain measures makes them difficult to enforce. For example, one measure requests that boat operators stay within radio contact on the same side of a group of Hawaiian spinner dolphins while viewing. This measure would be difficult to enforce because recreational vessels viewing spinner dolphins may not have or require a radio, and enforcement personnel may have difficulty identifying the non-compliant parties that were not on the same side of the dolphins as those parties that were first to arrive for viewing. The combination of these factors led to the decision to eliminate this alternative from further analysis.

Some measures in the WHVS are similar in nature to other alternatives under consideration in this FEIS and the preferred alternative, and may therefore still be addressed. For example, measures that prohibit leap-frogging or promote time-area closures are under consideration and are incorporated into Alternatives 4 and 5. Notably, the closures in the Alternatives 4 and 5 encompass somewhat larger areas for longer timeframes, thus providing similar but greater protections for the spinner dolphins.

NMFS recognizes the value of community-based programs and codes of conduct such as the WHVS, which help promote responsible behaviors among marine recreational providers. Voluntary participation programs such as this and Dolphin SMART are valuable in helping to promote spinner dolphin conservation as regulations are implemented for all user groups, and NMFS hopes to continue to work with the community of West Hawai‘i and CORAL.

2.9.6 Limiting the Time, Number, and Distance of Vessels Approaching Hawaiian Spinner Dolphin Groups

To address disturbance issues associated with close approach and the intensity of Hawaiian spinner dolphin-directed activities, NMFS considered and eliminated from further analysis an alternative that would prohibit close approach and place limitations on the time and number of vessels allowed to view a group of spinner dolphins. Restrictions under consideration included prohibiting approaching a spinner dolphin group within 50 yards, limiting the number of vessels that are within 100 yards of the spinner dolphin group to three, and placing a 30-minute viewing cap on boats within that 100 yard radius.

NMFS evaluated a 50 yard and 100 yard approach distance. Changes in spinner dolphin behavior are detectable when vessels or swimmers are found at distances ranging out as far as 500 m (Forest 2001, Danil *et al.* 2005, Courbis and Timmel 2008, Timmel *et al.* 2008, Symons 2013, Johnston *et al.* 2014) and effects generally increased as distance from the dolphins decreased (Ross 2001). Scientific studies also indicate that swimmer presence within 150 meters (164 yds) reduces the likelihood of spinner dolphins being in a resting state. However, we also recognized that not all approaches within 100 or 150 yards may result in take of spinner dolphins. A 50 yard approach distance is the most appropriate to prevent take of spinner dolphins from occurring, while placing the least restrictive burden on the viewing public. This alternative is consistent with regional guidelines and Dolphin SMART program criteria that recommend limiting your time around spinner dolphins to 30 minutes, and limiting the number of vessels around a spinner dolphin group.

NMFS eliminated this alternative from further analysis. Although particularly high numbers of swimmers and vessels can be problematic, limiting the number of human users allowed in a dolphin resting bay at any given time can still result in take if the human users closely approach the dolphins. Under this measure, it would be technically infeasible to maintain a three-boat minimum in a radius of 50–100 yards around a moving group of spinner dolphins, because it would require that all viewing parties inside and outside the 100-m radius are aware of the dolphins' location at all times to maintain the proper distance from the animals and other boats. Enforcing this regulation would require knowledge or evidence regarding the amount of time that each boat spent within proximity of a group of spinner dolphins. In addition, this alternative may encourage other activities that result in disturbance, such as corralling, as vessels compete for proximity to a group of spinner dolphins.

2.9.7 Alternative Geographic Scopes for Implementing Regulations for Hawaiian Spinner Dolphins

NMFS considered and eliminated from further analysis implementing regulations that would encompass the entire range of the three MHI island-associated stocks of Hawaiian spinner dolphins, which has been determined to be within 10 nm (18.5 km) from shore, in order to provide comprehensive protection for all resident spinner dolphin behaviors and habitats. However, we have no information to suggest that these three stocks face intense exposure to wildlife viewing activities that cause take in the outer portions of their range, while these stocks are feeding at night.

However, the predictable pattern of the resident spinner dolphins' geographic distribution, their daytime behaviors, and the relative ease of access to the population during the day in relatively calm waters, concentrates these viewing and interaction pressures nearshore. These same impacts are not expected to be prevalent in the outer portions of the resident stocks' range, because the dolphins are not easily accessed when they are offshore during the evening hours. Therefore, NMFS determined that a restricted boundary (2 nm from shore and the designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe) would be sufficient to provide protections for the MHI resident stocks, and would meet the purpose and need for this action. See section 2.1.1.1 for a further discussion of how this boundary was determined.

NMFS also considered and eliminated from further analysis implementing regulations throughout all waters within the U.S. Exclusive Economic Zone (EEZ) of the Hawaiian Islands, which would extend protections to all Hawaiian spinner dolphin stocks within Federal jurisdiction. This would include the five island-associated stocks and the Pelagic stock. As with the 10 nm alternative, the best available information does not indicate that dolphin-directed activities are occurring out to the boundary of EEZ, nor do spinner dolphins engage in important daytime behaviors this far offshore. Moreover, the purpose and need for this action is geared toward offering further protections for the island-associated stocks, and best available science indicates these stocks do not range beyond 10 nm.

Accordingly, NMFS selected the 2 nm and designated waters because best available information indicates that the selected range encompasses the areas where most dolphin-directed activities are likely to be concentrated, and where dolphins engage in important daytime behaviors. NMFS has no information to suggest that these three stocks face exposure to wildlife viewing activities

that cause take in the outer portions of their range. The preferred, narrowly tailored, geographic scope thus meets the purpose and need for this action.

We further note that because almost all viewing and interaction pressures occur within 2 nm from shore and the designated waters bounded by Lānaʻi, Maui, and Kahoʻolawe, implementing these same regulations throughout the entire range of the spinner dolphin stocks, or within the entire U.S. EEZ, would have substantially similar consequences as under alternatives 2-5 that have been analyzed in this FEIS. For this reason as well, these alternatives have been eliminated from consideration.

Chapter 3 - Affected Environment

3.1 Hawaiian Spinner Dolphins

3.1.1 Description

Spinner dolphins received their common name due to their display of aerial leaping behaviors and vertical spins. The species name, Stenella, is Latin for "long beak," referring to the slender shaped rostrum, or beak, of these animals. Generally, the spinner dolphin is a slender species, with thin, recurved flippers, and dorsal fins usually range from slightly falcate to erect and triangular (Jefferson *et al*. 2008).

Spinner dolphins are relatively small compared with other species in the Delphinidae family (oceanic dolphins), Among Gray's spinner dolphins (the subspecies that includes Hawaiian spinner dolphins), adult females range in size from 1.39–2.04 m long and adult males are 1.60–2.08 m long; the dolphins may reach weights of a least 82 kg (Jefferson *et al*. 2008). There is a great deal of color variation in spinner dolphins across the globe, depending on the region and subspecies of dolphin; however, Gray's spinner dolphins exhibit a tripartite color pattern with countershading from dark to light (Jefferson *et al*. 2008). The three-part color region consists of a dark gray dorsal/top cape, a light gray side and a white ventral/bottom field (Reeves *et al*. 2002; Perrin and Gilpatrick Jr. 1994).

Spinner dolphins are found throughout the world in tropical and warm-temperate waters (Perrin and Gilpatrick Jr. 1994). Four subspecies of spinner dolphins have been described worldwide: *Stenella longirostris longirostris* (also known as Gray's spinner dolphin), which includes the Hawaiian spinner dolphin, in the tropical Atlantic, Indian and western and central Pacific Oceans; *S. l. orientalis* in the eastern tropical Pacific Ocean; *S. l. centroamericana* near Central America; and *S. l. rosiventris*, the dwarf spinner dolphin, in southeast Asia to northern Australia (Reeves *et al*. 2002). The Gray's spinner dolphin is the typical form of spinner dolphin found in most areas of the world (Jefferson *et al*. 2008).

3.1.2 Distribution and Geographic Range

Spinner dolphins are common and abundant throughout the entire Hawaiian Archipelago (Shallenberger 1981, Norris and Dohl 1980, Norris *et al*. 1994) and up until 2010, NMFS managed Hawaiian spinner dolphins as a single stock within the U.S. EEZ of the Hawaiian Islands (Carretta *et al*. 2009). Data now indicates genetic distinctions between spinner dolphins

throughout the islands and atolls (Andrews 2009, Andrews *et al*. 2010, Hill *et al*. 2009), and these distinctions are supported by photo identification and animal movement data (Karczmarski *et al*. 2005). NMFS 2010 Stock Assessment Report (SAR) (Carretta *et al*. 2011) recognized these distinctions between groups by describing six newly defined stocks of spinner dolphins within the U.S. EEZ of the Hawaiian Islands (Fig. 9):

1. Kure/Midway
2. Pearl and Hermes Reef
3. Kauaʻi/Niʻihau
4. Oʻahu/4 Islands (*i.e.*, Maui County) Region
5. Hawaiʻi Island
6. A pelagic stock, which includes French Frigate Shoals.

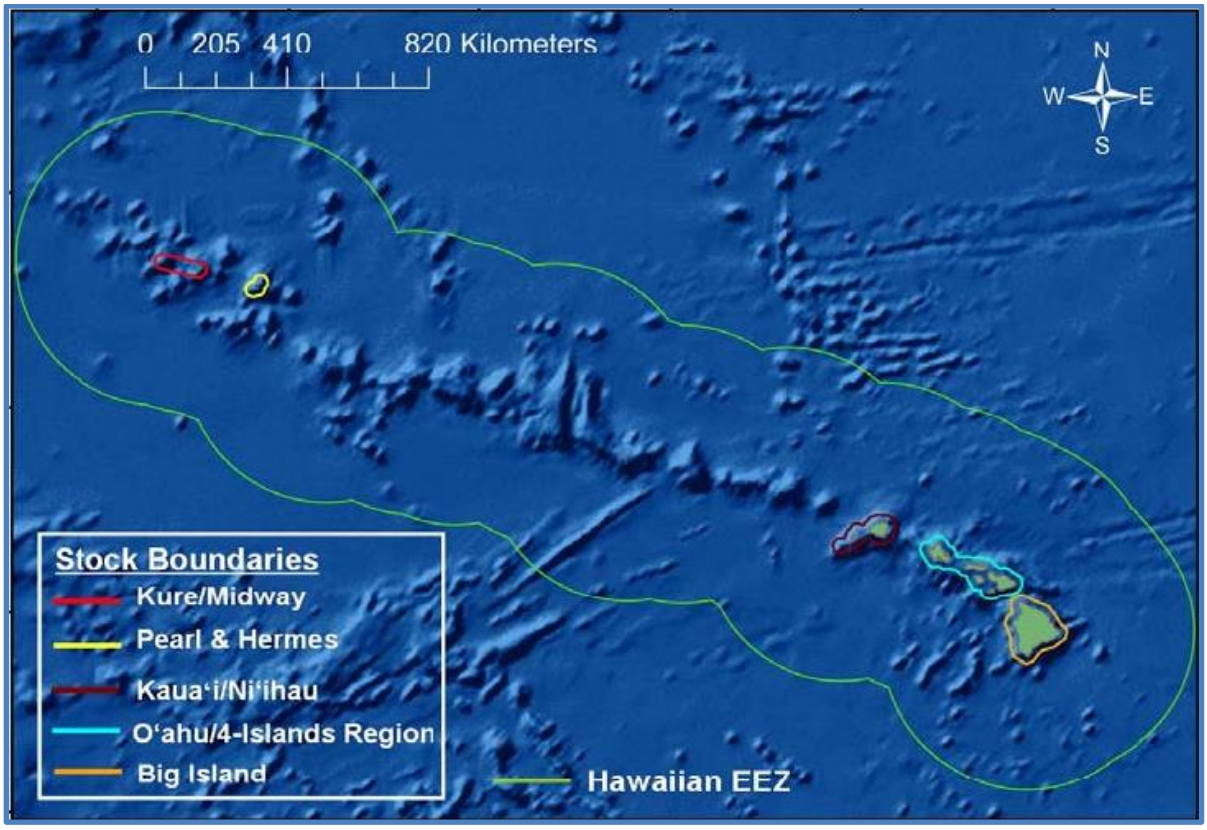

Figure 9: Hawaiian Spinner Dolphin Stock Boundaries in the U.S. EEZ

Five of the described stocks are island-associated and exhibit distribution and daytime behavior patterns linked to their namesake areas. These island-associated stocks are generally described as having a coastal distribution, resting in bays and protected areas near shore during the day and then fusing into larger groups to feed in deeper offshore waters on fish, shrimp and squid at night. In 2003, Benoit-Bird and Au noted that, based on tracking data of Hawaiian spinner dolphins by Norris and colleagues in 1994, spinner dolphins followed the horizontal migration of prey species from 1 km to 8 km offshore of this coastline. NMFS currently describes the boundary for the five Hawaiian island-associated stocks as 10 nm (18.5 km) offshore, based on the best available sighting and tracking data (Carretta *et al.* 2019). Spinner dolphins found beyond 10 nm (18.5 km) from shore are part of the Hawaiʻi pelagic stock (Carretta *et al.* 2019).

3.1.3 Reproduction

Like all marine mammals, spinner dolphins are slow reproducers, and live for about 20 years, with some individuals living for at least 25 years (Marten and Psarakos 1999). Spinner dolphin mating may occur year-round, with multiple males mating with one female (Perrin and Gilpatrick 1994). Gestation is similar to other dolphin species, and lasts approximately 11 months. Calving occurs year-round, with calving intervals averaging 3 years, and lactation often occurring for 1 to 2 years (Perrin and Gilpatrick 1994). Sexual maturity occurs at around 7 years of age (Perrin and Gilpatrick 1994).

3.1.4 Ecology and Behavior

3.1.4.1 Aerial Behavior

Regarded as one of the most acrobatic of dolphins, spinner dolphins are well known for their habit of leaping from the water and spinning up to seven times on their axis before falling back to the water (Jefferson *et al*. 2008). These behaviors are common in immature and mature spinner dolphins of both sexes (Norris *et al*. 1994). Experts believe that dolphins use these behaviors primarily for acoustic signaling or communication (Norris *et al*. 1994, Perrin and Gilpatrick 1994). Such signals could provide information about the behavior of nearby conspecifics and allow for localization or detection from a distance (Norris *et al*. 1994). These cues could assist with coordination of group formations and group movements, as well as help groups prepare to travel in and off shore (Norris *et al*. 1994). Researchers have also postulated that aerial spinning may serve a secondary function in removing ectoparasites, such as remoras (Fish *et al*. 2006).

3.1.4.2 Social Behavior and Habitat Use

Spinner dolphins, in general, are gregarious in nature. Worldwide, spinner dolphins show variation in dispersal, genetic structure and social structure (Andrews *et al*. 2010). Much of this variation appears to be largely driven by environmental conditions and resource availability. For example, offshore spinner dolphins are known to congregate in large groups of hundreds to thousands of animals, sometimes creating aggregations containing other species, such as spotted dolphins (Jefferson *et al*. 2008). These large groups travel over wide geographic distances, and the group size is thought to both promote foraging efficiency in pelagic areas where prey may be more unpredictable in nature and provide for additional protection from predators (Andrews *et al*. 2010).

Island-associated dolphins, including five of the Hawaiian spinner dolphin stocks, use the shelter and resources available in and adjacent to near-shore marine habitats. The waters near island slopes often provide a substantial amount of nutrients to concentrate prey species, making prey resources more predictable and available. For example, spinner dolphins in Hawai‘i feed on the

mesopelagic prey layer, which migrates towards the surface and inshore at night. Spinner dolphin behavior in these habitats reflects that of preferred prey species. Accordingly, these dolphins are nocturnal foragers that capitalize on the horizontal and vertical migration of prey species at night.
During daytime hours, island-associated Hawaiian spinner dolphins seek sanctuary in near-shore waters, where they return to certain areas to socialize, rest and nurture their young (Norris and Dohl 1980). These areas are typically in clear, calm and relatively shallow waters, usually with a sandy bottom that presumably provides an environment in which the dolphins are able to visually monitor for predators, as they cease echolocation while they rest (Norris *et al*. 1994). Spinner dolphins use a variety of bays throughout their range, but seem to prefer certain bays. As referred to earlier in this document, these essential daytime habitats are thought to have specific environmental characteristics that make them more favorable to the dolphins. This idea is strengthened by recent results of a habitat model assessment for spinner dolphin resting habitat. Thorne and colleagues, in 2012, used dolphin surveys from the MHI and predictive habitat modeling to identify environmental factors that may make spinner dolphins favor these areas for rest. The study found that proximity to deep water foraging areas, depth, the proportion of bays with shallow depths and low rugosity were important predictors of spinner dolphin habitat. The bays that were predicted by the model to be optimal resting habitats are consistent with spinner dolphin resting habitats that are recognized as preferred from field observations.

In the Hawaiian Archipelago, spinner dolphins exhibit two different grouping behaviors or social structures. In 1980, Norris and Dohl described spinner dolphin groups in the MHI as being small to moderate in size. Spinner dolphins in the MHI form "fission-fusion" grouping patterns: that is, smaller groups "fuse" together at night to feed in large groups offshore, and then break into small groups again while resting and socializing near shore in the day (Norris and Dohl 1980, Würsig *et al*. 1994). Researchers have observed this fission-fusion behavior on the island of O'ahu as well, and grouping patterns may be more fluid at this location (Lammers 2004, Andrews *et al*. 2010). This behavior is likely reflective of the availability of multiple areas for sheltered resting habitats along the coastlines of the high volcanic islands in the MHI (Norris and Dohl 1980, Karczmarski *et al*. 2005, Andrews *et al*. 2010, Thorne *et al*. 2012).

In the northwestern atolls of Kure and Midway, on the other hand, island-associated Hawaiian spinner dolphins form large, long-term, stable groups. These groups are composed of long-term associates that use each atoll lagoon on a daily basis for rest periods, and offshore waters of the atolls at night for foraging (Karczmarski *et al*. 2005, Andrews *et al*. 2010). Karczmarski *et al*. (2005) found very little interchange between the spinner dolphin populations at remote atolls in the Northwestern Hawaiian Islands (NWHI), whose group dynamics are more structured and closed. They suggested this finding may be influenced by restricted and limited resting habitats that are separated by large distances, which is in sharp contrast to the several suitable and closely located resting habitats of the MHI.

3.1.4.3 Resting Behavior

The rigid, cyclical and patterned behavior of a Hawaiian spinner dolphin's day is well documented from observations of spinner dolphins off the Kona coast on the Island of Hawai'i. The day begins with a descent into rest around sunrise, when the dolphins return from nocturnal

foraging grounds (Norris *et al*. 1994). Larger groups, comprised of multiple synchronized subgroups, are the first to return to the resting areas from offshore (Norris *et al*. 1994). Upon arrival, the dolphins exhibit a high degree of social interactions and acoustic communication (Norris *et al*. 1994, Lammers 2004). As the dolphins enter the more shallow resting areas, subgroups become less evident and the larger group moves more synchronously as a tight unit (Norris *et al*. 1994). Movements of the dolphins become slower and the animals begin their rest behaviors; the use of echolocation and acoustic communication quickly and dramatically reduces (Norris *et al*. 1994). Beyond the normal functions of rest, the prolonged periods of near-silence may play an important role for tissue regeneration in the sound-producing structures that are heavily used for echolocation during nightly foraging activities (Norris *et al*. 1994).

Norris *et al*. (1994) noted that there is no spinner dolphin behavioral pattern that is more distinct than rest; resting behavior has been characterized as un-dolphin-like because individuality is suppressed in favor of group action (much like schooling fish). When resting, spinner dolphins move back and forth slowly as a single unit, with animals in tight formation but spaced just out of contact with one another (Norris *et al*. 1994). Resting behaviors may occur for about four to five hours daily, but may vary seasonally, coinciding with the shifts in day length. During rest, spinner dolphins rely on vision rather than echolocation for scanning their environment; therefore, group movements during rest are restricted to open sand bottom areas where predators are more visible (Norris *et al*. 1994).

The end of the spinner dolphin rest period is usually indicated by an abrupt and sudden increase in activity level; swim speeds, aerial behaviors, short dives and vocalizations all significantly increase (Norris *et al*. 1994, Lammers 2004). Norris *et al*. (1994), described a "zig-zag" swim pattern following the rest period, consisting of the dolphins swimming toward the open waters and then doubling back into shallower waters. This back-and-forth swimming repeats a zig-zag formation over most of the area, possibly functioning as a social cue for the entire group to coordinate their movement into the deeper seas. The acoustic behaviors likewise rise and fall synchronously with the zig-zag swimming patterns. When these patterns subside, there is a swift and rapid race to the offshore waters as the spinner dolphins head toward the 100-fathom isobath, where they are sometimes joined by bottlenose or spotted dolphins. At this point, spinner dolphins' dive times are extended and the dolphins begin their foraging movements (Norris *et al*. 1994).

Resting behavior in all of the island-associated Hawaiian spinner dolphins is generally similar; spinner dolphin groups come into shallow waters during the day to rest, nurture their young, and socialize then move offshore later in the day to forage. Recent research on the Island of Hawai‘i found that the most important factor contributing to the likelihood of rest was whether they were within a bay or not (Tyne *et al*., 2014), suggesting that essential daytime habitats play an important role in the daily resting periods. However, differences in resting strategies do exist based on the type of habitat available and the number of animals present, as is evident along O‘ahu's coastline. Along O‘ahu's western (leeward) shore, sheltered bays at Mākua Beach, Kahe Point and Pōka‘ī Bay are described as gathering sites where multiple groups of spinner dolphins meet after foraging at night (Lammers 2004). These sites have large stretches of white sand bottom and are usually more sheltered from prevailing trade winds (Lammers 2004).

The somewhat more exposed habitat of the south shore of O‘ahu has no sites with large stretches of white sand bottom and no specific aggregation sites, and spinner dolphin groups using this side appear in much larger groups throughout the resting period (Lammers 2004). Lammers hypothesized that these higher group numbers were maintained to achieve adequate vigilance for predators and accommodate for reduced visibility in these areas. He documented that spinner dolphins are not restricted to specific sites on the western and southern shores of O‘ahu, but that they spend much of the day traveling, showing a strong affinity for the 10-fathom isobath. Resting behavior for these spinner dolphins coincides mostly with the time of day (midday to late afternoon) and the dolphins are able to use more than one strategy to attain rest (Lammers 2004). Aside from using sheltered areas with light bottom substrate for rest, spinner dolphins also use a secondary approach, which Lammers described as “rest while on the move.” Using this strategy, groups of spinner dolphins maintain a preference for shallow water (10-fathom isobath) to detect predators, but also maintain large numbers, where vigilance responsibilities may alternate between subgroups in order to accomplish rest during daytime hours. The strategy employed by resting spinner dolphins along O‘ahu's coast is likely determined by habitat available to them and the number of animals present in the group (Lammers 2004).

3.1.4.4 Foraging and Diet

Spinner dolphins feed predominately at night (Norris and Dohl 1980). Hawaiian spinner dolphin prey is primarily composed of species found in the mesopelagic boundary community, which is a land-associated assemblage of small fish, shrimp and squid found in waters beyond the island slopes (Benoit-Bird *et al*. 2001). An examination of Hawaiian spinner dolphins’ stomach contents revealed that myctophid fish represented 50% of animal remains in the dolphins' stomachs (Benoit-Bird 2004). Additionally, contents revealed large proportions of mesopelagic squid (including Abralia trigonura and A. astrosticta) as well as large amounts of sergestid crustacean (Sergia lucens, also known as Sakura shrimp), both of which are components of the mesopelagic boundary community. This community predictably and consistently migrates vertically from 400–700 m in the day to less than 400 m at night; and horizontally from about 2 km offshore to about 1 km, at which point these animals reach their maximum density (Benoit-Bird *et al*. 2001).

The mesopelagic community provides substantially more energy than what was predicted to support the Hawaiian spinner dolphin populations, and dolphin foraging patterns are most likely constrained by time and efficiency rather than prey availability (Benoit-Bird 2004). The mesopelagic abundance in the waters off O‘ahu's Wai‘anae coast was estimated to be significantly higher (1,800 organisms per m^3) than the abundance off Hawai‘i Island’s Kona coast (700 organisms per m^3) (Benoit-Bird *et al*. 2001). However, the mesopelagic layer in Kona waters covered a larger area vertically and horizontally, as it was visible for about 30 km, thereby covering a greater area than the 10-km-wide layer in Wai‘anae waters (Benoit-Bird *et al*. 2001).

The complex foraging patterns of Hawaiian spinner dolphins include temporal and spatial overlaps with their prey species (Benoit-Bird and Au 2003). Spinner dolphins do not feed offshore all night, instead following the migration of their mesopelagic prey horizontally as the prey move close to shore (about 2 km) around midnight, and then return offshore by 3 AM

(Benoit-Bird *et al*. 2001). During this same time period, spinner dolphins simultaneously track the vertical migration of their prey from about 100 m deep to less than 50 m around midnight, and then descend back to depths greater than 100 m at about 3 AM (Benoit-Bird *et al*. 2001).

Hawaiian spinner dolphins forage cooperatively, forming consistent pairs in structured patterns within the groups, seemingly a direct response to the migrations of the prey species (Benoit-Bird and Au 2003). Research describes the Hawaiian spinner dolphins actively altering the features of their prey species by breaking up the prey into smaller groups and concentrating the prey into discrete patches (Benoit-Bird and Au 2003). It is plausible that this dynamic foraging behavior evolved to allow spinner dolphins to efficiently exploit the highest densities of their prey species (Benoit-Bird and Au 2003). A study by Benoit-Bird (2004) predicted the Hawaiian spinner dolphins required a minimum consumption rate of 1.25 prey items (each about 10 centimeters long) per minute throughout the foraging period to meet their daily energetic needs.

3.1.4.5 Hawaiian Spinner Dolphin Resident Populations

Norris *et al*. (1994) suggested that the Island of Hawai‘i and its surrounding waters may have a large, relatively stable "resident" population of Hawaiian spinner dolphins. They based this observation on re-sightings of particular animals in essential daytime habitats off the Kona Coast — photo-identification catalogs from this area date back to 1979. Periodic surveys have re-sighted several individual animals, indicating that some components of this population include long-term residents (Norris *et al*. 1994, Östman-Lind *et al*. 2004). In particular, Norris *et al*. (1994) identified one individual from the same catalog 24 years prior, while Östman-Lind *et al*. (2004) positively matched up to 8 individuals from the photos dating back 14 years. Studies in the NWHI likewise recognized high geographic fidelity to resident atolls with relatively infrequent group movement (Karczmarski *et al*. 2005, Andrews *et al*. 2005).

While scientists acknowledged the residency patterns of the dolphins, prior to genetic research that was published in 2009 they knew little about Hawaiian spinner dolphin movement between the Islands and throughout the chain. Since spinner dolphins have the capacity for high mobility and high rates of movement, interbreeding between areas was unclear until more recent genetic information began to uncover distinctions between stocks in the Hawaiian Archipelago. Recent studies on the genetic structure of spinner dolphins in Hawai‘i support previous conclusions that there is a significant differentiation between dolphins found in Hawaiian waters and other spinner dolphins globally (Galver 2002, Andrews 2009). In particular, Andrews (2009) found low genetic diversity of Hawaiian spinner dolphins compared with most spinner dolphins from other geographic regions, suggesting the existence of strong barriers to gene flow, both geographically and ecologically. This low diversity also indicates that spinner dolphin populations in Hawai‘i may be particularly vulnerable to environmental change, compared with spinner dolphins in other locations (Hill *et al*. 2010).

Researchers have also examined the spinner dolphin genetic structure within the Hawaiian Islands. In studies published in 2006, 2009 and 2010, Andrews and colleagues found genetic distinctions between spinner dolphins sampled at different islands in the Hawaiian Archipelago. They sampled 350 individual dolphins from a variety of locations: Kure Atoll, Midway Atoll, Pearl and Hermes Reef, French Frigate Shoals, Ni‘ihau, O‘ahu, Maui, and Lāna‘i and the Island

of Hawai‘i. The research revealed genetic distinctions between spinner dolphins sampled along the Kona Coast of the Island of Hawai‘i and spinner dolphins sampled at all other Hawaiian islands (Hill *et al*. 2010). Spinner dolphins sampled at Midway and Kure were not found to be genetically distinct from one another; however, these groups together are genetically distinct from all other islands sampled (Hill *et al*. 2010). Spinner dolphins at Pearl and Hermes showed significant genetic differentiation from all islands to the southeast and additional distinctions from dolphins sampled at Midway and Kure that are supported by photo-identification and movement studies (Hill *et al*. 2010). Further genetic distinctions are seen between other groups in the MHI; however, there appears to be some overlap between areas. While there is a clear genetic distinction between Maui and Lāna‘i, and Ni‘ihau and Kaua‘i, O‘ahu is undifferentiated from either. NMFS grouping of O‘ahu dolphins with Maui and Lāna‘i dolphins for the purposes of stock assessment is based on Andrews' 2009 genetic findings, and on the geographic proximity of these islands (Hill *et al*. 2010).

Andrews (2009) suggested that the variability in gene flow across the range of the Hawaiian spinner dolphin is strongly influenced by habitat. Specifically, observed genetic patterns may be a reflection of available resources (Andrews *et al*. 2010). The highest levels of gene flow were seen at the smallest islands (the far NWHI, French Frigate Shoals, Ni‘ihau, Kaua‘i and O‘ahu). Whereas the Island of Hawai‘i, with expansive resources along the coast, demonstrated a population genetically distinct from the other islands. Andrews *et al*. (2010) suggested that the high level of gene flow at the smaller areas might be driven by increased pressures of resource competition, and by inbreeding around the resource-limited small islands.

They cautioned that the Hawaiian spinner dolphins' high site fidelity indicates the need for site-specific management at each island. Additionally, small populations and genetically isolated populations may be particularly vulnerable to human-caused disturbance, especially those populations that remain genetically distinct from other areas in the chain, such as the Hawai‘i Island population and those small populations of the far NWHI. This information about the stock structure has provided more impetus to the efforts to enhance protections for spinner dolphins, as the threats to these isolated populations from human disturbance has become increasingly clear and concerning.

3.1.5 Population Size

Prior to 2011, most Hawaiian spinner dolphin stock assessments were based on shipboard surveys and assessments of the spinner dolphins across the entire archipelago (because the five stocks had not been recognized as genetically differentiated until 2010). The Pacific Islands Photo Identification Network (PIPIN), which identifies individual cetaceans by their unique dorsal fin patterns, has recently begun to analyze spinner dolphin photo-data to provide information about the populations within the MHI. Using information collected from various studies in distinct time sets, NMFS has calculated abundance for populations on Kaua‘i, O‘ahu and the Island of Hawai‘i; these estimates were presented in the 2018 SAR (Caretta *et al*. 2019). Although limited by data available in 2010, these estimates reflect small resident stocks. Table 5 (below) presents these estimates and identifies the limited periods over which information was captured to inform the population numbers. This information represents the best available estimate for this resident stock and, as a relatively small stock; these residents may be particularly vulnerable to threats that may affect the group's fitness.

Analysis of long-term trends has not been conducted with the available data because the methods used for spinner dolphin abundance surveys throughout the last several decades were not consistent, and are, therefore, difficult to compare. Although the most recent survey suggested a potential decline in the Hawai‘i Island stock from earlier studies, the research conducted in the 1980s did not include year-round surveys and used different methods and a different survey area than more recent 2010-2011 surveys (Norris *et al.* 1994; Tyne *et al.* 2014; Carretta *et al.* 2019).

Table 5: Abundance estimates for populations of Hawaiian spinner dolphins

Island	Month/Year	Abundance	Standard Error	Source
Kaua‘i/Ni‘ihau	Oct- Nov, 2005	601	121	NMFS 2012 SAR
O‘ahu	Jun – Jul, 2002	160	23	NMFS 2012 SAR
	Jul – Sep, 2007	355	31	NMFS 2012 SAR
Hawai‘i	May – Jul, 2003	790	132	NMFS 2012 SAR
	Jan – Mar, 2005	280	59	NMFS 2012 SAR
	Jan – Mar, 2006	205	33	NMFS 2012 SAR
	Sep 2010 – Aug 2011	631	60.1	Tyne *et al.* (2014)

3.1.6 Conservation Concerns

The main threat to spinner dolphins in Hawai‘i arises from human interactions in the form of vessels (motorized and non-motorized) and individuals in the water with these dolphins in their resting habitats. However, other concerns exist such as fishery-related mortality and the emerging concern of the effects of the increasing use of Unmanned Aircraft Systems (UAS). There have been no other documented sources of injury or mortality to spinner dolphins, including vessel strikes or fishery-related intentional take.

3.1.6.1 Human Interactions with Dolphins in Essential Daytime Habitats

As described in Chapter 1 of this document, human interactions with spinner dolphins in the MHI have been chronically high in recent years. Hawaiian spinner dolphins are being targeted in essential daytime habitats for both wildlife viewing and swim-with-wild-dolphin activities, which sometimes result in spinner dolphin disturbance and may be influencing changes in behavioral patterns overtime (Forest 2001; Courbis 2004, 2007; Lammers 2004; Danil *et al.* 2005; Östman-Lind 2009). Recent relevant publications support these findings. Tyne *et al.* (2017) and Wiener (2016) found socializing behavior occurred in the early mornings and late afternoons in essential resting habitats on Hawai‘i Island and Oahu with rest mainly occurring

between 10:00 and 16:00. Spinner dolphins were never observed foraging during daytime, when resting was the predominant activity. As a result, the authors propose that the constrained nature of spinner dolphin behaviors suggests that they are less resilient to human disturbance than other cetaceans. Additionally, Heenehan *et al.* (2016) found seasonal variation in Makako Bay and Kealakekua Bay, suggesting that the importance of these bays for resting dolphins changes throughout the year. Using passive acoustic monitoring (PAM) equipment and visual observations, this study found that dolphins were recorded on 90% of days (dolphins recorded on 506 out of 565 days) in Makako Bay and approximately 65% of days (dolphins recorded on 315 of 484 days) in Kealakekua Bay, both on Hawai‘i Island. These bays experienced greater use than Kauhakō Bay (51% or dolphins recorded on 274 of 536 days) and Hōnaunau Bay (37% or dolphins recorded on 209 out of 563 days). While this is acknowledged as a conservation concern for spinner dolphins because these chronic dolphin-directed activities could result in long-term impacts to the population, the potential for additional conservation concerns exists throughout Hawaiian waters. These are discussed below, along with the conservation efforts that are in place to protect Hawaiian spinner dolphins.

3.1.6.2 Fishery Related Mortality

Information on fishery-related mortality of cetaceans in Hawaiian waters is limited, but the gear types used in Hawaiian fisheries have been a cause of marine mammal mortality and serious injury in other fisheries throughout U.S. waters. Research shows that entanglement in gillnets and hooking and entanglements in various hook-and-line fisheries occurs for small cetaceans in Hawai‘i (Nitta and Henderson 1993). Between 2012 and 2016, seven spinner dolphins were reported hooked or entangled by fishing gear or marine debris in the MHI (Carretta *et al.* 2019). Based on photographs and descriptions of the dolphins, both injuries are considered serious under the most recently developed criteria for assessing serious injury in marine mammals (NMFS 2012). It is not possible to attribute either interaction to a specific fishery given insufficient details about the gear involved.

According to Bradford and Lyman (2015), there were six additional reports between 1991 and 2006 of spinner dolphins found entangled, hooked or shot. No estimate of annual human-caused mortality and serious injury is available for near-shore fisheries because these fisheries are not observed or monitored for protected species interactions. In Hawai‘i, there are currently two distinct longline fisheries; the deep-set longline (targeting tuna) and the shallow-set longline (targeting swordfish). Both fisheries operate in U.S. waters and on the high seas, but the fisheries are closed in areas where the island-associated stocks occur (Carretta *et al.* 2013). Between 2007 and 2011, no spinner dolphins were observed hooked or entangled in either longline fishery (McCracken 2013, Bradford and Forney 2014). After 2011, there have been no observed interactions with spinner dolphins (NMFS Pacific Islands Regional Office Observer Program annual reports).

NMFS has anecdotal reports of increasing dolphin interactions with baited hooks and catch. It is not known whether these interactions result in serious injury or mortality of dolphins, or whether Hawaiian spinner dolphins are involved.

3.1.6.3 Use of Unmanned Aircraft Systems

The use of non-military small UAS, or drones, has increased throughout the world in recent years (Choi-Fitzpatrick *et al.* 2016). UAS can offer a new method for scientific researchers and emergency responders to obtain important information about marine mammals (Chabot and Bird 2015; Christie *et al.* 2016), and can allow photographers and videographers to capture the beauty of marine mammals. Despite these benefits, UAS have the potential to be disruptive to marine mammals if not used safely, appropriately, or responsibly.

3.1.7 Conservation Efforts

Worldwide, spinner dolphins are designated as "Data Deficient" in Version 3.1 of the International Union for Conservation of Nature (IUCN) Redlist. A taxon is Data Deficient when there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required.

NMFS has published marine mammal viewing guidelines for watching spinner dolphins (and other marine mammals) in Hawai'i to protect them from excessive disturbance by people. These guidelines can be found at http://www.nmfs.noaa.gov/pr/education/viewing.htm. NMFS staff also regularly attend community outreach events to promote dolphin conservation.

In 2011, NMFS launched Dolphin SMART in Hawai'i, a program aimed at encouraging voluntary conservation among tour operators and supporters (see section 1.3.3.1 for a complete description of the program). More information on the Dolphin SMART program can be found at the following websites: www.dolphinsmart.org and www.facebook.com/OfficialDolphinSmart.

A community-based conservation effort, the West Hawai'i Voluntary Standards for Marine Tourism (WHVS) was developed by the Coral Reef Alliance (CORAL) with stakeholder input and consensus by a wide variety of Hawai'i Island community members. In 2008, CORAL began working with members of the local community of the Kona coast towards development of voluntary standards for marine tourism activities. As part of this effort, a set of standards was developed for wildlife interactions, including interactions with Hawaiian spinner dolphins. The measures were developed by a working group that included representatives of local dolphin tour companies, dive companies, and kayak rental businesses, as well as representatives from the State of Hawai'i DLNR, NMFS, and the Hawaiian Islands Humpback Whale Sanctuary, among others (see section 2.10.5 for a complete description of the WHVS). The process was completed in 2009 and the standards published online at the following website: http://www.coral.org/west_hawaii_standards.

3.1.8 Hawaiian Spinner Dolphin Daytime Habitat Site Descriptions

The following section describes those essential daytime habitats sites that NMFS identified in Appendix A where human interactions with Hawaiian spinner dolphins are known to occur.

Although there may be many other locations used by spinner dolphins in the MHI that are not described here, NMFS focused the discussion on those areas where spinner dolphin use is considered regular and where dolphin-directed activities are most likely to be affected by the identified action alternatives. The areas discussed below are those 12 areas identified in section 2.7.1 where spinner dolphin essential daytime habitats are found and where spinner dolphins exhibit signs of chronic disturbance as a result of human activities. These areas may also be found in Table A-3 of Appendix A.

3.1.8.1 O'ahu

Leeward Coast

The western coastline of the island of O'ahu is herein referred to collectively as the Leeward Coast. It stretches from Ka'ena Point on the far northwestern tip of O'ahu, to Barbers Point at the southwest. Along this coast there is an abundance of the type of habitat preferred by spinner dolphins for daytime resting — relatively shallow, sandy-bottom habitat that is sheltered from winds and swells. Although certain sites appear to be used frequently, including Pōka'ī Bay, Mākua Bay and Kahe Point (Electric Beach), these are not distinctly delineated bays such as those found on the Island of Hawai'i; instead, the dolphins slowly transit along the entire coastline. Spinner dolphins at these sites are found traveling and "milling" (a back-and-forth swimming pattern close to the bottom of the water or along the coasts) during the daytime rest period, and they appear to have a strong affinity for the 10-fathom isobath (Lammers 2004). This route was nicknamed the "spinner expressway," describing the consistent occurrence of spinner dolphins traveling in different directions and often interacting briefly (Lammers 2004). Spinner dolphins that researchers first identified in 1978–79 were seen again in 1995–1998 surveys, suggesting that this coastline may be an important habitat for spinner dolphins (Marten and Psarakos 1999). Spinner dolphins off this coast are considered to be more skittish than dolphins in other areas (the Kona coast), and act more evasively around people (C.Wiener, PhD. Candidate, personal communication, April 2014).

Off this coastline, Hawaiian spinner dolphin-directed activities include approximately 10 to 12 commercial dolphin-watching tour operations that are based at Wai'anae Boat Harbor and Ko Olina Boat Harbor, three of which are Dolphin SMART businesses (L. McCue, PIRO, personal communication, May 24, 2014). Commercial tour boats in this area tend to be larger to accommodate more passengers. Sepez (2006) noted that commercial tours tend to target Mākua Bay first and Kahe Point second. Commercial operators also communicate with each other on the location of the dolphins. Congregations of tour vessels on one group of animals are common. Shore-based swimming, stand-up paddle boarding and/or kayaking with the dolphins occurs at Kahe Point, Mākua Bay and Pōka'ī Bay on an almost daily basis. As identified in section 1.4.1., Danil *et al*. (2005) described swimmer presence in Mākua Bay as highest in the morning and noted that morning swimmers were often observed in close proximity to or in pursuit of the dolphins, with 65% of the swimmers within 100 m of the dolphins. The majority of swim-with-wild-dolphin activities are conducted from the tour boats on this coast.

3.1.8.2 Maui

La Perouse Bay

La Perouse Bay is located adjacent to the ʻĀhihi-Kīnaʻu Natural Area Reserve, on the south coast of the island of Maui east of Kīhei and Wailea. Hawaiian spinner dolphins are reported as common at this site, though noted by most not to occur daily (Sepez 2006, Hawaiʻi Wildlife Fund 2008). ʻĀhihi-Kīnaʻu is protected by the State of Hawaiʻi, which prohibits any commercial boating activity within the bay; however, La Perouse does not have this protection and is open to commercial use. Approximately four spinner dolphin-watching tour companies operate from Maalaea Harbor and the Kīhei boat ramp, and visit La Perouse Bay. In addition, guidebooks discuss the site and direct visitors there to experience swimming with wild dolphins. La Perouse typically has very rough waters and some visitors are deterred by these conditions; however, some do still make the choice to swim there when spinner dolphins are sighted. There is also a group of local residents who swim with the dolphins on a regular basis at this site. In the past, a DLNR ranger was usually present and made an effort to educate visitors about the risks to themselves and to the dolphins, but the success of this effort is limited (J. McDonald, DLNR ranger, personal communication, November, 2007), and participation has ceased in the last several years as resources have become limited. NOAA OLE reports that 25 complaints of human approaches to spinner dolphins are received from this area per year, on average (T. Tomson, NOAA OLE, personal communication, July 2011).

3.1.8.3 Hawaiʻi Island

Hōnaunau

Norris *et al*. (1994) observed Hawaiian spinner dolphins using this bay across eight months of aerial surveys, and saw groups in the 1–50 and 51–100 size ranges. Courbis and Timmel (2009) reported observing spinner dolphins in the bay 5 out of 23 days, with a mean group size of 19.3 animals. A recent report recorded an average group size of 24 in this bay (Johnston *et al*., 2014). Passive acoustic monitoring of the bay from June 2011 to Feb 2012 detected spinner dolphins in the bay 43% of the days monitored, with the average time of entry to the bay around 10:28 AM (Johnston *et al*. 2014). Residents of the area have indicated that spinner dolphins may be using the area less frequently than in years past, as well as entering the bay later in the day (see Appendix A).

Hawaiian spinner dolphin-directed activity in this bay is centered on swimmers (Sepez 2006, Courbis 2007, Courbis and Timmel 2009, Östman-Lind 2009) with easy entrance to the water and relatively calm waters, swimmers are able to easily access the dolphins in this area. Tour vessels, often zodiacs, are found in the area and allow passengers to enter the water to snorkel and swim with the dolphins (Sepez 2006, Courbis 2007). These vessels may operate out of Honokōhau harbor to the far north, or from the less distant Keauhou Bay boat ramp. Courbis (2007) found that the number of kayaks increased in this area with the presence of spinner dolphins, but that the number of motorboats decreased; she also noted that boaters may be deterred from using the area when the boat channel is congested with spinner dolphins and swimmers in the water. Residents indicate that large groups of people come to the bay to swim with the dolphins and that people bring toys to engage the animals in play (see Appendix A). For example, people engage the animals in the “leaf game” in which people bring toys into the water to interact with the dolphins.

Honokōhau Harbor

Norris and colleagues (1994) note that the largest groups of Hawaiian spinner dolphins were found from Honokōhau to Kīholo Point. Spinner dolphins can be found resting just outside the main commercial harbor entrance. In the past, swimming with the dolphins in this area appeared limited due to harbor traffic; however, recent accounts from researchers indicate that people do occasionally get in the water to swim with the dolphins (C. Wiener, researcher, personal communication, April, 2014). Additionally, spinner dolphin tour boats frequently stop here on their way out of the harbor to allow customers to view the dolphins from the boat. There are currently over 20 spinner dolphin tour companies that depart from Honokōhau Harbor.

Kailua Bay

Although there is a high level of boating activity occurring in this bay because it is designated by the State of Hawai‘i as an Ocean Recreation Management Area ORMA (see section 3.4), Hawaiian spinner dolphins also attempt to use this bay for resting. Norris and Dohl (1980) noted that spinner dolphins are found in the Kailua Bay area, but that dolphins in this area do not appear to reach quiescence at this site. They hypothesized that this may be due to the increased traffic in the area. Sepez (2006) noted that tour vessels often depart from the area and head north to Makako Bay, Makalawena Beach and Kua Bay, but they frequently come to Kailua Bay and will drop snorkelers into the water to swim with the dolphins, regardless of the safety issues presented by the level of boating activity that occurs at this bay.

Kauhakō Bay (Ho‘okena)

Norris *et al*. (1994) noted observing Hawaiian spinner dolphins, ranging in groups of 1–50 and 51–100 animals, during aerial surveys across 9 months of the year. Courbis (2007) and Courbis and Timmel (2009) later reported observing spinner dolphins on 11 out of 16 days and 11 out of 18 days, respectively, with an average group size of 25 animals. A recent report recorded an average group size of 29 in this bay (Johnston *et al*. 2014). Community members report that the dolphins’ use of the bay has decreased over the years, and some believe that this decrease in spinner dolphin use is due to the pressures from human interactions in the bays (D. Kennison, Ho‘okena resident, personal communication, October 2007). The primary source of interactions in the bay is largely attributed to swimmers from shore (Wiener 2016). Passive acoustic monitoring of the bay from June 2011 to Feb 2012 detected spinner dolphins in the bay 55% of the days monitored, with the average time of entry to the bay around 9:46 AM (Johnston *et al*. 2014).

Hawaiian spinner dolphin-directed activity in this bay is centered on swimmers from shore (Sepez 2006, Courbis 2007, Courbis and Timmel 2009, Östman-Lind 2009). Along with Hōnaunau and Kealakekua bays, Kauhakō Bay is part of the three-bay complex that Sepez (2006) noted draws both resident and visitor beach-based swimmers. Courbis and Timmel (2009) described swimmer activity in the bay as directed at approaching and interacting with the dolphins, and Courbis (2007) noted that the number of swimmers in the area was significantly higher when spinner dolphins were present. Some local residents also come here on an almost daily basis to swim with the dolphins.

Kealakekua Bay

Studies in this bay indicate that Hawaiian spinner dolphins regularly use Kealakekua Bay for rest (Doty 1968, Norris and Dohl 1980, Norris *et al*. 1994, and Forest 2001). Group size in this bay

range at a maximum of 50–90 animals, but reported averages are around 30 animals (Doty 1968, Norris and Dohl 1980, Norris *et al*. 1994, Forest 2001, Timmel 2005). A recent report recorded an average group size of 41 in this bay (Johnston *et al*. 2014). Recent passive acoustic monitoring of the bay from June 2011 to Feb 2012 detected spinner dolphins in the bay 63% of the days monitored, with the average time of entry to the bay around 8:38 AM.

Kealakekua Bay is perhaps the most well-known and popular site in the Hawaiian Islands for swimming and kayaking from shore to interact with Hawaiian spinner dolphins. Kealakekua is part of the aforementioned three-bay complex. People are known to bring toys and leaves to the area to engage the dolphins (as described in the previous section on Hōnaunau Bay). There is a fairly large contingency of local residents who come to this site on a daily basis to swim with the dolphins. There are also several "bed-and-breakfast" establishments that are rented by groups who hold retreats and seminars regarding the spiritual aspects of swimming with wild dolphins. Sepez (2006) reported that there may be up to 30–50 kayaks transiting the bay every day, with more on holidays. She also reported that 15–20 local residents swim from shore with the dolphins regularly, and that 5–10 additional visitors may swim from shore as well; these numbers do not include swimmers who may enter the water from the various vessels.

Commercial activities include boat tours (both motorized and kayaks) of the bay to view the wildlife, including Hawaiian spinner dolphins. Local businesses also offer guided kayak tours. While other activities (such as visiting the monument) may attract kayakers to the area, the presence of spinner dolphins in the bay often results in kayakers changing course to get a closer look, and even jumping into the water to swim with them. To address the proliferation and use of unpermitted kayak rentals in the area, the State of Hawai'i's DLNR placed a moratorium prohibiting operating, launching, transiting, beaching or landing kayaks and other vessels from Nāpō'opo'o within the waters of Kealakekua Bay and at Ka'awaloa Flats starting January 2, 2013 (Hawai'i DLNR 2012). Consequently, the Bay reopened to two permitted commercial kayak businesses on April 1, 2013 (Hawai'i DLNR 2013a), and on May 30, 2013 DLNR began to issue special-use permits for recreational activities in the Bay (Hawai'i DLNR 2013b). The closure should have reduced vessel activity around spinner dolphins; however, researchers found that there was no visible difference in the impact of human presence to spinner dolphin behavior or use of the bay during this closure (J. Tyne, researcher, personal communication, March 2014).

Courbis and Timmel (2009) noted that the swimmers and vessels were always present when Hawaiian spinner dolphins were in this busy bay, and researchers (Forest 2001, Courbis and Timmel 2009) noted that the spinner dolphins altered their aerial behavior patterns compared with earlier behaviors reported in studies by Norris and Dohl (1980). Östman-Lind (1980) also noted significantly more aerial behavior when people were within 100 m of the dolphins in this bay, as well as changes in the areas used by the dolphins for rest. Researchers (Forest 2001, Timmel 2005, and Johnston *et al*. 2014) also note that spinner dolphin behavior often changed in other ways due to human disturbance, such as exhibiting increased tail slaps or leaving resting bays prematurely. Johnston and colleagues performed focal follows on spinner dolphins at Kealakekua Bay for 23 days and found that swimmers or vessels were present within 300 m of a group of spinner dolphins for 90.3% of sampling events, and were present within 150 m of a group for 75.5% of sampling events (Johnston *et al*. 2014).

Kehena Beach
Known to local residents as "Dolphin Beach," Kehena Beach is located in the Puna District on the east side of Hawai‘i Island. This is one of the only sites on the east coast of the Island of Hawai‘i where Hawaiian spinner dolphins are known to come to rest. The water here is usually very rough and the entry and exit can be dangerous, so it is not a place where tourists typically go to swim with the dolphins; however, a sizable group of local residents swim with the dolphins here on a regular basis.

Mahai‘ula and Makalawena
The beaches of Mahai‘ula and Makalawena are part of the Kekaha Kai State Park, located north of the Keahole Airport. Hawaiian spinner dolphins are frequently seen at this site, moving south on their way to Makako Bay. Some swimming from shore to the dolphins occurs here, but the waters are usually fairly rough and most people do not attempt it at this site. Spinner dolphin tour boats come here from nearby Honokōhau Harbor and typically follow the dolphins as they travel south to Makako Bay, “leap-frogging” to intercept the dolphins as they pass by.

Makako Bay/Ho‘ona Bay
Norris *et al*. (1994) noted that Makako Bay is an area used by dolphins in group sizes ranging from 1–50, 51–100 and more than 100 animals (frequently 180–200 animals). A recent report recorded an average group size of 102 in this bay (Johnston *et al*. 2014). Passive acoustic monitoring of the bay from June 2011 to Feb 2012 detected Hawaiian spinner dolphins in the bay 85% of the days monitored, with the average time of entry to the bay around 8:48 AM. The bay can be viewed from shore by walking from a parking area north on a trail that leads through the ancient Hawaiian village site of Ho‘ona.

Within a short distance of Honokōhau Harbor, this bay is considered the first stop for tour boats to check for Hawaiian spinner dolphins, and has one of the highest levels of tour interactions with spinner dolphins (C. Wiener, researcher, personal communication, April 2014). There is no shore-based swimming with the dolphins at this location due to the very rough waters, rocky cliffs and a lack of an easy exit point once someone has entered the water.

3.1.8.4 Kaua‘i

Na Pali Coast
The Na Pali coast is recognized as an area that Hawaiian spinner dolphins use for resting. Norris and Dohl (1980) indicated that the largest group sizes in this area were along this coastline with estimates of 150 animals. This coastline provides very few protected bays; however, the sandy habitat along the coastline may provide areas for near-shore resting (Sepez 2006).
Sepez (2006) noted that the Na Pali coast is one of the areas where people interact with Hawaiian spinner dolphins. Sightseeing, diving and snorkeling tours may depart from Port Allen, Waimea and Hanalei, heading to the Na Pali coast for the dramatic scenery, and spinner dolphins may be encountered along the route. There are currently approximately 12 commercial operators that conduct tours along the coast and advertise opportunities to view wild dolphins, one of which is a Dolphin SMART operator. Currently, there is only one known tour operator that publicly

advertises swimming with spinner dolphins in this area. Additional interactions may occur with kayakers who utilize the area for sightseeing purposes but these activities do not appear to be spinner dolphin-directed along this coast.

3.1.8.5 Lānaʻi

Hulopoʻe Bay

This site is a well-known Hawaiian spinner dolphin resting area that is located adjacent to a privately owned park and the Four Seasons Mānele Bay Hotel. The dolphins are known to use the west end of the bay, closest to the hotel. Residents of the area indicated that spinner dolphins may be using the area less frequently than in years past (see Appendix A). In the past, the hotel promoted swimming with the dolphins to their guests and on their website; however, residents raised concerns during the scoping period about regulatory measures closing the only easily accessible beach recreation area, prompting an end to these promotions. The hotel is now a Dolphin SMART Proud Supporter, which provides educational materials on the dolphins' use of the site as a resting area while encouraging guests to view the dolphins from shore rather than swimming out and disturbing them. Although the bay is a state-designated Marine Life Conservation District (MLCD) and is closed to boats (except for permitted use by the Trilogy Excursions catamaran tours), some concern remains about spinner dolphin disturbance at this site because spinner dolphin tour boats from Maui transport passengers to the outside edges of the bay, allowing passengers to access this site by swimming or snorkeling.

3.2 Protected Marine Species and Habitats

Certain species and habitat are protected under the MMPA, ESA, and Magnuson-Stevens Fishery Conservation and Management Act (MSA), whose range or location may overlap with the proposed action area (within 2 nm from shore in the MHI). As noted in Chapter 1, all marine mammals are protected under the MMPA. Species receiving these protections that occur in Hawaiʻi's waters include multiple species of cetaceans and the Hawaiian monk seal (see Table 6 below). Several of these species of marine mammals also receive protections under the ESA. In addition to these listed marine mammals, the ESA also provides protection for several species of sea turtle within Hawaiʻi's waters (see Table 6 below). A full list of marine species that are protected throughout Hawaiian waters can be found in Appendix E. This FEIS only discusses those protected species — as identified in Table 6 below — that are likely to be present within the relatively shallow or near-shore coastal waters of the project area.

Table 6: Protected marine species

Common Name	Scientific Name	ESA Listing Status
ESA protected		
False Killer Whale – Hawaiian Insular DPS	*Pseudorca crassidens*	Endangered
Hawaiian Monk Seal	*Neomonachus schauinslandi*	Endangered
Green Turtle (Central North Pacific DPS)	*Chelonia mydas*	Threatened

Hawksbill Turtle	*Eretmochelys imbricata*	Endangered
Giant Manta Ray	*Manta birostris*	Threatened
MMPA protected		
False Killer Whale – Hawaiian Insular DPS	*Pseudorca crassiden*s	Endangered
Humpback Whale	*Megaptera novaeangliae*	NA
Pygmy Killer Whale	*Feresa attenuata*	NA
Short-finned Pilot Whale	*Globicephala macrorhynchu*s	NA
Bottlenose Dolphin	*Tursiops truncatus*	NA
Pantropical Spotted Dolphin	*Stenella attenuata*	NA
Rough-toothed Dolphin	*Steno bredanensis*	NA
Hawaiian Monk Seal	*Neomonachus schauinslandi*	Endangered

3.2.1 ESA-Protected Marine Species

ESA-protected marine species include those species that are listed as either threatened or endangered under the ESA. Only those species that may be affected by the proposed action are discussed in this section.

3.2.1.1 Humpback Whales

Humpback whales are no longer listed as endangered under the ESA. On April 21, 2015, NOAA Fisheries proposed to divide the globally listed species into 14 distinct population segments (DPSs), remove the current species-level listing and, in its place, list 2 DPSs as endangered and 2 as threatened (80 FR 22304). Whales using Hawai‘i’s waters as a wintering ground were identified as a DPS in this proposal, but were not identified as a group requiring the protections of the ESA. This proposed change in the Hawai‘i DPS’s ESA listing status became final on December 21, 2016 (81 FR 93639). Hawaiian humpback whales do not receive protections under the ESA, but continue to be protected under the MMPA.

The humpback whale (*Megaptera novaeangliae*) is present around the MHI during the winter breeding and calving season (typically from October through May). They are known to come quite close to shore and may be present within certain Hawaiian spinner dolphin essential daytime habitats. As noted in section 1.3.1, there are 100 yard approach regulations — promulgated under the ESA and the National Marine Sanctuaries Act — in Hawaiian waters to protect humpback whales from human disturbance by any means. Despite these regulations, people are sometimes reported swimming with or closely approaching humpback whales in areas where these animals are found close to shore, such as spinner dolphin essential daytime habitats. For example, while observing spinner dolphin activity in Kealakekua Bay, researchers observed humpback whales on 39 of 59 days, and saw people swimming with the whales on seven occasions (Tyne *et al*. 2014). Additional information, including the whale's range, abundance, status and threats, can be found in the recovery plans for the species, available on the NMFS

website, and is herein incorporated by reference:
http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_humpback.pdf.

3.2.1.2 Hawaiian Monk Seals

The Hawaiian monk seal (*Neomonachus schauinslandi*) is found throughout the MHI, where the population is thought to number approximately 150 individuals (Carretta *et al.* 2014). Hawaiian monk seals are found in near-shore waters and resting bays because they use adjacent coastal beaches and shorelines throughout the MHI to rest, molt, give birth, nurse, and avoid predators. In the marine areas that border these coastal habitats, and throughout the areas where spinner dolphins are found during the day, monk seals may be found foraging, traveling or socializing with other seals. Additional information, including the seal's range, abundance, status and threats, can be found in the recovery plans for the species, available on the NMFS website, and is herein incorporated by reference:
http://www.nmfs.noaa.gov/pr/pdfs/recovery/hawaiianmonkseal.pdf.

3.2.1.3 False Killer Whales

The MHI insular population of false killer whales (*Pseudorca crassidens*) is found in the near-shore waters throughout the MHI, and was listed as an endangered DPS under the ESA on November 28, 2012 (77 FR 42082). Similar to resident stocks of Hawaiian spinner dolphins the insular stock of false killer whales exhibits island-associated movement patterns that indicate adaptation to the local habitat. Insular stocks' boundaries are described as a minimum convex polygon bounded around a 72-km radius of the MHI (Bradford *et al.* 2015), which overlaps and exceeds the range of resident Hawaiian spinner dolphin stocks. Areas heavily used by insular false killer whales, tracked throughout the MHI, generally occur at deeper depths than those used by Hawaiian spinner dolphins for resting (Baird *et al.* 2012). However, overlap is likely in other portions of the spinner dolphins' range and is likely to vary by island and by time of day. These overlaps in range may occur as spinner dolphins move towards or return from deeper foraging habitats and in areas where spinner dolphins traverse deeper habitats during the day. For example in the Maui County area, spinner dolphins travel between islands during the day and may be found in these deeper habitats where insular false killer whales are also found. Additional information about the ecology and management of this species is available on the NMFS website, and is herein incorporated by reference:
http://www.fpir.noaa.gov/PRD/prd_false_killer_whale.html.

3.2.1.4 Sea Turtles

Both the green sea turtle (*Chelonia mydas*) and the hawksbill sea turtle (*Eretmochelys imbricata*) are known to occur within the project area. The hawksbill sea turtle is listed as endangered throughout its range, and was listed in 1978. The green turtle was also listed under the ESA in 1978 and the listing was recently revised to recognize the differences in status between 11 different DPSs; 8 DPSs were listed as threatened and 3 DPSs were listed as endangered (81 FR 20058; April 6, 2016).Turtles found in waters of the Hawaiian Archipelago and Johnston Atoll were identified as the Central North Pacific DPS and the status was listed as threatened.

Additional information, including the turtles' range, abundance, status and threats for each species is available on the NMFS website, and is herein incorporated by reference:
Green turtle: http://www.fpir.noaa.gov/PRD/prd_green_sea_turtle.html

Hawksbill: http://www.fpir.noaa.gov/PRD/prd_hawksbill.html

3.2.1.4 Giant Manta Rays

NMFS listed giant manta rays (*Manta birostris*) as threatened in 2018 (83 FR 2916). The environmental variables that drive giant manta ray movements are largely unknown. They are found offshore in oceanic waters near productive coastlines, continental shelves, offshore pinnacles, seamounts and oceanic islands. Although giant manta rays are considered oceanic and solitary, they have been observed congregating at cleaning sites at offshore reefs and feeding in shallow waters during the day at depths <10 m (O'Shea *et al*. 2010; Marshall *et al*. 2011a; Rohner *et al*. 2013).

Additional information about giant manta rays, including status and threats is available on the NMFS website, and is herein incorporated by reference:
https://www.fisheries.noaa.gov/species/giant-manta-ray

3.2.2 MMPA-Protected Species

As noted in Chapter 1, the MMPA provides protections for marine mammals. In addition to those marine mammals that are listed under the ESA and described in the subsections above, other protected whales and dolphins may occur in near-shore waters of Hawai‘i and are listed in Table 6 above. Of the species listed in Table 6, the bottlenose dolphin may be found throughout the Hawaiian spinner dolphins' essential daytime habitats and throughout the range of the resident populations of spinner dolphins (Carretta *et al*. 2014). Pantropical spotted dolphins, short-finned pilot whales, pygmy killer whales, and rough toothed dolphins may overlap with the range of the Hawaiian spinner dolphin. Information from across the MHI indicates that these four species may be more commonly sighted in deeper depth ranges (Baird *et al.* 2013). Overlap in range may vary by island and by time of day, similar to insular false killer whales. As evident from online videos, people do seek out other marine mammal species for viewing and swim-with opportunities; this includes some of the species (e.g., humpback whales) listed above in Table 6. Further information on these species can be found in NMFS' annual stock assessment reports and is herein incorporated by reference: http://www.nmfs.noaa.gov/pr/sars/species.htm.

3.2.3 Protected Habitat

In addition to protecting species, the ESA and MSA protect certain areas or habitats. Under the ESA, areas that are protected for listed species are designated as critical habitat and Federal agencies consult with NMFS to ensure the effects of their activities are minimized and do not adversely modify the habitat. In accordance with the MSA, NMFS and the Fishery Management Councils identify Essential Fish Habitat (EFH) that supports every life stage of each federally managed fish species; within these areas, habitat areas of particular concern may also be identified for conservation, management, or research reasons. Through EFH consultations, NMFS recommends ways that Federal agencies can avoid or minimize the adverse effects of

their action on the habitat that supports federally managed fisheries. Areas designated as EFH surrounding Hawai‘i can be mapped at the following address: http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html

3.2.3.1 Critical Habitat

Critical habitat is defined by the Endangered Species Act (ESA) and refers to areas that are important to the recovery of ESA listed species. Each designation describes physical and/or biological features found in the habitat that are essential for the conservation of the listed species, and that may require special management and protection. Under the ESA, Federal agencies must take precautions to ensure that activities that they fund, authorize (permit) or carry out do not destroy or adversely modify designated critical habitat.

The Hawaiian monk seal and the MHI insular false killer whale are the only ESA listed species with critical habitat designated within the geographic scope of this action. Hawaiian monk seal critical habitat was recently revised in 2015 (80 FR 50925), expanding the designation in the NWHI and adding new areas in the MHI. In the marine environment of the MHI, Hawaiian monk seal critical habitat includes the seafloor and marine habitat to 10 m above the seafloor from the 200 m depth contour through to the shoreline. The essential features of Hawaiian monk seal critical habitat include: preferred pupping and nursing areas (including terrestrial and marine habitat), significant haul-out areas (in terrestrial areas) and foraging areas (in marine areas) out to 200 m in depth. There are no preferred pupping areas found adjacent to the areas proposed for time-area closures; accordingly, areas selected for proposed closures do not support the marine aspect of this essential feature. Time-area closures identified in Alternatives 4 and 5 would be located within the critical habitat designation in areas that may support Hawaiian monk seal foraging. More information describing this designation can be found at http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm.

Critical habitat for MHI insular false killer whales was designated on July 24, 2018 (83 FR 35062) and includes the geographic area of the 45-m depth contour to the 3200-m depth contour in waters that surround the MHI from Niihau east to the Island of Hawaii. Critical habitat for the MHI IFKW consists of one essential feature comprised of four characteristics: (1) adequate space for movement and use within shelf and slope habitat; (2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; (3) waters free of pollutants of a type and amount harmful to MHI IFKWs; and (4) sound levels that would not significantly impair false killer whales' use or occupancy. Time-area closures identified in Alternatives 4 and 5 would be located outside of the MHI IFKW critical habitat designation. Detailed information on MHI insular false killer whale critical habitat can be found at: https://www.fisheries.noaa.gov/species/false-killer-whale#conservation-management.

3.2.3.2 Essential Fish Habitat

EFH is defined in the MSA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The EFH guidelines under 50 CFR 600.10 further interpret the EFH definition as follows:

> Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

EFH has been designated for all of the federally managed fish species, referred to as the Management Unit Species (MUS), in the Pacific Islands Region. Under the MSA, EFH must be identified and conserved. Designations for each MUS varies in water depth and by life stage, but the areas are bounded by the shoreline, and the seaward boundary of the EEZ. All five time-area closures would be located within areas of EFH. Additionally, Habitat Areas of Particular Concern (HAPC) have been identified within EFH. EFH and HAPC are summarized in Appendix D and described in further detail in the Fishery Ecosystem Plan (FEP) for Hawai‘i, which can be found at the following website: http://www.fpir.noaa.gov/SFD/pdfs/feps/Hawaii_FEP.pdf.

3.3 Benthic Habitats

The primary benthic habitat that is found within the Hawaiian spinner dolphins' near-shore resting habitat is a white sand bottom, bordered by darker rock and coral. Experts think that resting spinner dolphins prefer the sandy-bottomed habitats because it provides a light-colored background, against which it is easier to detect predators, such as sharks. Researchers have observed that spinner dolphins restrict their rest periods along shore to locations of patches of open sandy bottom sufficiently large enough to support their rest patterns (Norris *et al.* 1994). Spinner dolphins rely solely on vision to detect predators while resting, as they change from acoustical cueing of behavior to the use of vision (Norris *et al.* 1994).

The sandy benthic habitat found within Hawaiian spinner dolphin resting sites may include many different organisms, such as clams, worms or crabs. Of particular note is the presence of garden eels in the sand-bottom habitat at Makako Bay; hence the local name for the bay "Garden Eel Cove."

3.4 Social and Cultural Resources

The following section describes human activities that are not dolphin-directed within the dolphin resting areas discussed in section 3.1.7. For bays not selected for time-area closures, discussion focuses on activities that may be affected in some manner by the various alternatives under consideration that focus on regulating human activities. For the five bays where time-area closures are being proposed for implementation, NMFS discusses additional information gathered throughout the scoping period concerning the historical, cultural and religious significance.

3.4.1 Dolphins and Native Hawaiians

There are certain cultural associations with the dolphin, or nai‘a in the Hawaiian language. For example, the following verse from the Hawaiian story of creation chant, the Kumulipo, describes the first fish to appear (or being born), swimming into the ocean of the sun:

> Hānau ka I‘a, hānau ka Nai‘a
> I ke kai lā holo.
>
> Born is the I‘a (fish), born the Nai‘a
> Swimming into the ocean of the sun
> (from http://www.sacred-texts.com/pac/lku/lku03.htm)

Some Native Hawaiians may consider the nai‘a an ‘aumakua (personal or family god, deified ancestor). Hawaiian culture is deeply rooted in their dependence on and knowledge of their natural environment, and each Native Hawaiian family may have many ‘aumakua (Honua Consulting 2013). Accordingly, some Hawaiian fishermen see the nai‘a as a good omen or a protector.

3.4.2 Traditional and Cultural Practices

Traditional and cultural practices occur throughout the MHI including in places within the action areas. These traditional activities include fishing; subsistence gathering of ocean resources by cultural practitioners, such as limu (seaweed) and pa‘akai (salt); hoe wa‘a (canoe paddling); gathering of cultural resources for spiritual and cultural protocols; lā ‘au lapa‘au (medicine or medicinal plant usage); ancestral caretaking and worship; worship of akua (god) and ali‘i; care of burial sites; and care of historical sites (Honua Consulting 2013). Section 3.4.5 discusses the particular activities occurring at each site, as identified in interviews with local residents.

3.4.3 Traditional Historic Properties

Examples of culturally significant historic properties that may be found within or adjacent to the Hawaiian spinner dolphin resting areas are described in the following paragraphs.

3.4.3.1 Onshore Traditional Historic Properties

Traditional Hawaiian sites can be found along the shorelines of all of the MHI. They occur in a range of natural environments from rocky headlands to sandy beaches. An excellent example of this is Pu‘uhonua O Hōnaunau, adjacent to Hōnaunau Bay, which is listed on the National Register of Historic Places.

The types of historic properties found near the shoreline include the following:

> Canoe landings and canoe sheds: While canoe landings are often natural features such as small sand beaches or areas of gently sloping shingles where a canoe could easily be brought ashore, canoe sheds were long, narrow, stone-walled enclosures that were originally roofed with thatch.

Fishing shrines and other religious sites: Small fishing shrines (koʻa) were often built near the shoreline, usually on low promontories overlooking the sea. It was at these koʻa that the first fish of the catch was left as an offering to Kūʻulakai or one of the other patron gods of fishing. Larger religious structures (heiau) were usually set further back from the shore, but at times they can be found just above the high tide line.

3.4.3.2 Inter-Tidal Traditional Historic Properties

Very little archaeological evidence of past human activities has survived in the turbid environment of the surf zone. Some traditional features, however, have been documented within more gentle intertidal areas. These inter-tidal sites may include:

Fishing-related features: Along the shoreline where low promontories and fingers of lava extend out into the sea, it is not unusual to encounter depressions of various sizes and shapes that have been battered or ground into the surface of pāhoehoe (smooth lava). Hawaiians who fished the tidal pools and the shallow offshore waters created and used these depressions for a range of purposes, including as bait cups (mortar-like depressions used in grinding palu, or bait) and fish poison basins (shallow depressions where plants like ʻauhuhu and ʻakia were pounded to extract their juices, which were then used to stun fish in tidal pools).

Salt pans: Some of the shallow depressions pecked and ground into the pāhoehoe lava at or just above the high tide line were used for the manufacture of salt. These basins were filled with seawater, which was then allowed to evaporate. Hawaiians collected the resulting salt crystals used them to season food and for ceremonial purposes.

Rock art: Some traditional Hawaiian petroglyphs were carved into the surface of level lava or sandstone benches that extend out into the intertidal zone.

3.4.3.3 Off-Shore Traditional Historic Properties

While there are a substantial number of pre-contact historic properties located within the shoreline zone, there are relatively few located in the offshore waters. The sites that do exist are for the most part stacked stone structures.

Fishponds and fish traps: Stone-walled fishponds (and, to a lesser extent, fish traps) were traditionally constructed in the shallow offshore waters that fringe the leeward coasts (and sheltered portions of the windward coasts) of several of the MHI. The largest concentrations of traditional loko iʻa (fishponds) are located along the southern coastlines of Oʻahu and Molokai and the west coast of Hawaiʻi Island, though loko iʻa can be found on almost all of the main islands. Traditional fishponds are most commonly of two types, either loko kuapā (walled shoreline ponds) or puʻuone (inland ponds connected to the sea). While many ancient ponds are long abandoned (the walls of some having been damaged or destroyed, others silted in), some ponds have been restored and are actively used for aquaculture.

Ceremonial sites: There is archaeological evidence that some traditional ceremonial structures were located within the offshore zone, but such sites are relatively rare. The most well-known of these is the heiau (place of worship) of Hale o Kapuni located in Pelekane bay on the Kohala coast of the island of Hawai‘i. This shrine is submerged just offshore below the larger heiau of Mailekini and Pu‘ukoholā and near the former royal compound within Pu‘ukoholā National Historic Site.

3.4.3.4 Traditional Cultural Properties

Traditional Cultural Properties (TCPs) are more difficult to recognize than most archaeological sites since their significance often depends less on a physical structure and more on a religious, cultural, mythical or historic event or ritual associated with the place. At present, there has been no TCP identified within the action area; however, it is likely that wahi pana (storied places) or leina a ke akua (leaping-off points from which a departing spirit enters the next world) may be present. Bays and beaches, stretches of shoreline and other natural landmarks may be associated with mythic or historic figures, traditional activities, or historic events.

3.4.4 Areas Not Considered for Time-Area Closure Implementation

The following areas were not considered for time-area closures based upon the selection criteria used in Appendix A; however, they would still be subject to any other measures regulating human activities that may be included in the proposed regulations.

3.4.4.1 O‘ahu

Leeward Coast

Stretching the length of the western coastline of O‘ahu, the waters of the leeward coast are used by a variety of vessels or watercraft for a variety of activities including fishing, military training activities, recreational boating, recreational touring (snorkeling tours others that are not Hawaiian spinner dolphin-directed), diving, kayaking, canoeing and other watersport activities. Subsistence and quasi-commercial fishing for akule (bigeye scad, *Selar crumenophthalmus*) and ‘ōpelu (mackerel scad, *Decapterus macarellus*) is often described as a major activity along this coast, and conflicts have arisen between the spinner dolphin tours and the fishermen as a result of this overlap of activity (DOBOR 2009). Additionally, waters along this coastline are commonly used for recreational swimming.

3.4.4.2 Hawai‘i Island

Honokōhau Harbor

The main recreational and commercial harbor on the Kona coast, Honokōhau Harbor is located between the Kona Airport and the town of Kailua-Kona. With over 200 moorings, three ramps and several piers, the small boat harbor is a hub for commercial tour boats including fishing charters, whale and dolphin tour boats and dive and snorkel charters. The harbor is also used for recreational boating activities.

Kailua Bay
Kailua Bay is located in the town of Kailua-Kona and is the site of many ocean-based activities. The State of Hawai‘i designated Kailua Bay as an ORMA, which allows the use of personal watercraft, parasailing and other recreational boating activities in the bay. There is even an "island" in the middle of the bay equipped with recreational rentals (jet skis, kayaks, paddleboards and other items). This bay has a popular swim lane, and is used frequently by locals interested in swimming activities that are not Hawaiian spinner dolphin-directed, and where the swimming portion of the Ironman Triathlon is held. The annual Hawaiian International Billfish Tournament is held at the pier at this bay.

Kehena Beach
Kehena Beach is located in the Puna District on the east side of Hawai‘i Island. The beach is used by local residents as a "clothing-optional" beach and is also listed in many tourist guidebooks. The typically rough waters in this area limit swimmers, and there are no other activities commonly described for this stretch of area.

Mahai‘ula and Makalawena
As part of the Kekaha Kai State Park, Mahai‘ula, the southernmost beach in the park, is used for swimming, snorkeling and diving. In addition, the beach offers Kāwili Point, an area that surfers frequent. Makalawena (to the north) additionally offers swimming, snorkeling, surfing and diving opportunities.

3.4.4.3 Kaua‘i

Na Pali Coast
The Na Pali coast is a 15-mile stretch of undeveloped cliffs along Kaua‘i's northwest coastline. This area is a popular sightseeing attraction for visitors, but remains accessible only to those that hike or boat into the area. Commercial boat tours, recreational boaters and kayaks often tour this area to observe the scenery and wildlife.

3.4.4.4 Lāna‘i

Hulopo‘e Bay
Residents and visitors use this bay for recreation, particularly for snorkeling and swimming, and it remains the easiest accessible beach recreation area on the island (other locations on island may require four-wheel drive to access). The bay is considered subzone A of a two-part Marine MLCD that also includes nearby Mānele Bay (subzone B). With the MLCD status, the area has State-enforced regulations regarding fishing, removal of marine life and anchoring.

3.4.5 Areas Considered for Time-Area Closure Implementation

3.4.5.1 Hawai‘i Island

Kealakekua Bay

Kealakekua Bay is located approximately 13 miles south of Kailua-Kona. The name Kealakekua means "pathway of the gods." Described as one of the most important historical and archaeological areas in Hawai‘i, Kealakekua Bay was registered as the Kealakekua Bay Historic District on the National Register of Historic Places in 1973. The national significance of the area was described by the State of Hawai‘i in four general areas: the preservation of material remains; abundance of written sources; continuity of cultural tradition through time; and occurrence of significant cultural and historical events (http://pdfhost.focus.nps.gov/docs/NRHP/Text/73000651.pdf). The historical integrity preserved at this site is linked in part to the sheltered and isolated nature of the bay, which may have allowed for the preservation of materials, and to its distinction as being one of the first areas where Native Hawaiians engaged in lengthy contact with Westerners. Thus, early written accounts describe the uses and some of the significance of the sacred sites — including fishponds, burial caves, lava tubes, heiau, and shrines — found in this area.

Notorious as the location where Captain Cook was received and then later killed, Kealakekua's rich history describes villages that were major centers of political and religious power along the Kona coast (http://dlnr.hawaii.gov/dsp/files/2014/09/hsp_kealakekua_shp.pdf). The villages at Ka‘awaloa and Kekua (later known as Nāpō‘opo‘o), located along Kealakekua's shores, were well established and supported by extensive agricultural fields and the surrounding ocean resources prior to first European contact. Sites of historic and cultural significance located in and around Kealakeua include the Hikiau heiau, and the burial caves known as pali-kapu-o-keōua. The Hikiau heiau was a religious center located at Kealakekua, which was dedicated to the Hawaiian deity (Honua Consulting 2013). Pali-kapu-o-keōua is considered another sacred site located at the bay because the burial caves are thought to hold the iwi (bones) of many of the ancient Hawaiian ali‘i (royalty).

Beyond the landing site of Cook and the monument for his death, the bay also became the backdrop for historical events and patterns that describe the struggles of Hawaiian history post-contact. Kealakekua includes the site of the battle of Mokuohai during the war of succession between the forces of Kamehameha (the first King of all the islands) and those of the sons of Kalaniopu‘u (the last old ruling chiefs of Hawai‘i Island) (http://focus.nps.gov/pdfhost/docs/NRHP/Text/73000651.pdf). From 1800 to 1819, Kealakekua was declared a commercial and political center. Kamehameha used Kealakekua as a naval yard for war ships and established royal apartments at Nāpō‘opo‘o. The bay area became a shipping and provisioning port for explorers, whalers and traders, and in 1824 became the site of the first Protestant mission on Hawai‘i Island (Belt Collins 1997). Following this period, the population moved from Ka‘awaloa to Nāpō‘opo‘o. The first government-built wharf was established at Ka‘awaloa in 1863. The wharf at Nāpō‘opo‘o was constructed in 1922, and included the Hackfield and Co. general store and pineapple cannery (Belt Collins 1997).

The State of Hawai‘i recognized the historic and recreational significance of Kealakekua Bay and began acquiring lands around the bay to protect it from further encroachment. In 1969, Kealakekua Bay State Historical Park became the second area listed as a Marine Life Conservation District (MLCD) due to the historical significance, aesthetic appeal and academic and scientific values of the bay (DLNR 2009). The MLCD is divided into two subzones (A to the north and B to the south). In subzone A, all fishing, taking or injuring of marine life is prohibited, as is the anchoring or mooring of boats, except at locations or moorings designated by DLNR. The County of Hawai‘i identifies two public access points on Boulder Beach and Nāpō‘opo‘o landing at Kealakekua Bay (http://www.hawaiicounty.gov/pl-s-kona-map2). Interviews with lineal and cultural descendants from the area indicated that some traditional activities continue to take place in the area. These traditional activities include fishing; subsistence gathering of ocean resources by cultural practitioners, such as limu and pa‘akai; hoe wa‘a ; gathering of cultural resources for spiritual and cultural protocols; lā ‘au lapa‘au; ancestral caretaking and worship; worship of akua and ali‘i; care of burial sites; and care of historical sites (Honua Consulting 2013).

Currently, the bay attracts many users for recreation, commercial and traditional uses or purposes. Recreational uses include swimming, kayaking, snorkeling, scuba diving, standup paddleboarding, boating and visiting the Captain Cook Monument.

Hōnaunau Bay

Hōnaunau Bay was included with Pu‘uhonua O Hōnaunau National Park as a Historic District on the National Register of Historic Places in 1966 (http://pdfhost.focus.nps.gov/docs/NRHP/Text/66000104.pdf). With 15 significant remains described throughout the area and a partial inventory of 321 sites, the archaeological remains in this district are described as representing nearly every aspect of Polynesian culture. The archeological structures and features represent a timespan of over 700 years, the most famous of the features being the Pu‘uhonua (place of refuge), which is enclosed by the Great Wall, a massive 965-foot long masonry wall (http://www.nps.gov/puho/historyculture/index.htm). Warriors, noncombatants and those who violated the kapu (taboo or prohibition) once used the refuge. Pu‘uhonua O Hōnaunau remains a sacred ceremonial site in Hawaiian culture.

Significant archaeological remains also include a temple mausoleum for the ruling chiefs of Kona (Hale-o-Keawe), several heiau, royal houses, hōlua (a sled course built from lava rock), graves, fishponds, midden, and cave shelter sites. The many archaeological remains indicate that this area was a political and religious focal point on the West Hawai‘i coast and many mo‘olelo (stories) mention Hōnaunau as a famous launching/landing area for wa‘a (canoes) and fishing. The ancient village of Hōnaunau was home to chiefly retainers and commoners, and was the ancestral home of the Kamehameha dynasty. However, when trading began, Hōnaunau Bay was considered too shallow for ships and the ali‘i moved to locations more conducive to trade (http://www.nps.gov/puho/historyculture/index.htm).

The City of Refuge National Historical Park was first established on July 1, 1961. Now called Pu‘uhonua O Hōnaunau National Historical Park, it includes the refuge, palace grounds, royal fishponds, royal canoe landing area, stone-house platforms and temple structures. The National Park Service works to preserve and maintain sites within the 420 acres of park that abuts the bay.

Additional information about the history of the area, remains found in the park and the preservation of the site may be found on their website (http://www.nps.gov/puho/historyculture/index.htm).

Because the Puʻuhonua O Hōnaunau and related sites are immediately adjacent to Hōnaunau Bay, many Native Hawaiians consider the entire bay to be a sacred cultural site (L. Navas-Loa, Hōnaunau resident, personal communication, October 2007), which requires protection from activities that may degrade, destroy or detract from that sacred nature. Cultural events occur biannually in the park and the events often include canoe rides.

Outrigger canoe paddling has been a common practice in the history of Hōnaunau Bay, which continues to present day (http://www.nps.gov/puho/historyculture/index.htm). When this area became a National Historical Park in 1961, training and racing here ended. However, paddling began again in the 1970s with Hale o Hooponopono, a school teaching Hawaiian language, history and culture. Paddling, fishing, ʻopihi (limpet) picking, and canoe maintenance were taught at the school. In this bay, Keōua Hōnaunau Canoe Club hosts the Calvin Kelekolio long distance race annually, which starts in Hōnaunau Bay and heads north towards Kealakekua Bay. Every Labor Day weekend since 1971, Kai Opua Canoe Club has hosted the Queen Liliuokalani Long Distance Canoe Race (https://www.kaiopua.org/history.asp), which stretches from Kailua Bay to Hōnaunau Bay at the boat ramp. Approximately 3,000 people attend to watch or participate in the race each year. In addition, canoe rides are offered in the Bay twice a year during cultural festivals associated with the National Park; rides are generally offered between 10 AM and 3 PM.

The bay currently supports launches of recreational fishing boats from a small boat ramp used by local fishermen on a regular basis. It is also a popular dive and snorkel site, with a highly diverse coral ecosystem that provides for spearfishing opportunities and viewing the many colorful fish species that live there. A group of local residents, Ka Ohana O Hōnaunau, formed to address the extensive use of this site by educating visitors on its importance to Native Hawaiian culture and the fragile nature of the coral reef, as well as its importance as a Hawaiian spinner dolphin resting area. The County of Hawaiʻi identifies Hōnaunau Bay boat ramp as a public access area for this bay (http://www.hawaiicounty.gov/pl-s-kona-map3).

Interviews with lineal and cultural descendants from the area indicated that some traditional activities continue to take place in the area (Honua Consulting 2013). These traditional activities include fishing; subsistence gathering of ocean resources by cultural practitioners; canoe activities, including fishing from canoes; gathering of cultural resources for spiritual and cultural protocols; medicinal plant usage; ancestral caretaking and worship; worship of akua and aliʻi; and care of burial sites.

Kauhakō Bay (Hoʻokena)

Kauhakō Bay and the village of Hoʻokena are located in the South Kona district. The name Kauhakō means "the dragged large intestines" and refers to a moʻolelo about a chief who was killed by his people out of revenge; the name Hoʻokena means, "to quench thirst" and is the name of the ahupuaʻa that surrounds the bay (UH Department of Urban and Regional Planning, 2008).

Historic information gathered on this bay focuses on the late 19th century, when the bay was used as a thriving landing area and a village, churches, a store, and schools surrounded the landing area. In 1889, King Kalākaua advised the author Robert Louis Stevenson to visit Hoʻokena, as it was the best example of a typical Hawaiian village. The landing was the heart of the village with a store owned by Henry Cooper, called Cooper Landing. The bay supported interisland steamers landing until the mid-1930s, when trucks replaced steamships for cattle transportation, and surf and storms demolished the landing. After that time, occupancy shifted towards the highway where more activity could be found.

In 1999, the State DLNR, State Historic Preservation Division (SHPD) conducted a field inspection around the beach park area in conjunction with the construction of the restroom facilities and the accompanying septic tank and leach field. Staff archaeologists identified a rock wall about two feet high and 110 feet long that stands as a built historic resource between the Hoʻokena Beach Park parking lot and the restrooms and showers. However, modernizations (concrete to stabilize the rocks) made to a section of the wall compromised the significance and integrity of the wall, and the area did not qualify for inclusion in the National Registry.

The native Hawaiian fishing village of Hoʻokena is located on Kauhakō Bay. People use a variety of fishing methods in this traditional fishing area, the most popular being trolling and spearfishing with the Hawaiian spear; the least utilized include spearfishing with a spear gun, spearfishing on SCUBA and hukilau (seine) fishing. During a Hoʻokena community-based meeting held on September 10, 2012, residents indicated that fishing occurs at different times of the day throughout the year, depending on the species that may be in season. Of particular concern were those fisheries that occur over sandy-bottom habitat during the fall and winter months, such as lobster and Kona crab. Community members also indicated that the tradition of feeding the koʻa (fishing grounds), a traditional Hawaiian practice whereby fishermen take care of the fishery and the near-shore ecosystem, is practiced in the bay year round at various times. Residents indicated that fishing was a family practice and stated that families sometimes troll in boats and kayaks as shallow as 6–10 ft. of water while fishing in the area. People conducted traditional fishing practices mainly for ʻōpelu and akule. This is one of the only places remaining in Hawaiʻi where fishing is performed in the traditional manner using nets from Hawaiian three-board outrigger canoes, and the only place on the island where these canoes are launched from the beach (G. Oamilda, KUPA, personal communication, June 2007).

Community efforts in this area focus on passing this knowledge to the youth to maintain and promote cultural and community ties. Hoʻokena's community places great significance on the care of their marine resources, and local fishermen identify that the community members' lifestyle, cultural practice and physical health are connected to the marine resources (Hoʻokena community meeting, September 10, 2012). Community representatives have been working with the State DLNR toward protecting their marine resources by creating a proposed Community-Based Subsistence Fishing Area in the bay.

Hoʻokena has a popular County beach park where visitors can swim, snorkel, camp overnight and fish. It is a very small bay but has many ocean users competing for the area, including subsistence fishers, scuba divers, canoe paddlers and snorkelers. In agreement with the County of Hawaiʻi, the Friends of Hoʻokena Beach Park (FOHBP), a branch of the non-profit group

Kamaʻaina United to Protect the ʻAina (KUPA), manages the area's cultural and economic resources, as well as its daily operations. KUPA has an onsite booth where they also provide free educational materials. The County of Hawaiʻi identifies Hoʻokena Beach Park as a public access point for this area (http://www.hawaiicounty.gov/pl-s-kona-map3).

Interviews with lineal and cultural descendants from the area indicated that some traditional activities continue to take place in the area. These traditional activities include fishing; subsistence gathering of ocean resources by cultural practitioners; canoe activities, including fishing from canoes; gathering of cultural resources for spiritual and cultural protocols; medicinal plant usage; and ancestral caretaking and worship, including care of burial sites.

Makako Bay/Hoʻona Bay

Makako Bay and Hoʻona Bay comprise an adjacent two-bay complex, located south of the Keahole Airport and north of the Natural Energy Laboratory of Hawaiʻi Authority (NELHA) aquaculture facilities. When seen on the USGS map, Hoʻona Bay is located to the south and Makako Bay is to the north, but they are both frequently referred to simply as Makako Bay, as it is difficult to distinguish where one ends and the other begins. The area of Makako Bay/Hoʻona Bay is located within the ahupuaʻa of Kalaoa, makai (towards the sea) of Amanamana, north of Keahole Point.

This area was once surrounded by a coastal fishing village, which sat on the edge of a several mile long fishpond named Paaiea. Ancient Hawaiians navigated through the pond and used it as a protected passageway. The area was severely impacted when the volcano Hualālai last erupted in 1801 — the entire Amanamana area was covered by a pāhoehoe flow emanating from Puhi a Pele (often misspelled as Puhia Pele), the crater located on the north side of Hualālai's summit area. This crater is also known as Pele's Pit, reflecting the depth of the vent. With the fishpond covered from the lava flow and a barren landscape left behind, only a sprinkling of settlements arose afterwards at Hoʻona. Fishing continued to provide a livelihood and food for the village of Hoʻona and traditional practices included fishing, feeding the koʻa, as well as harvesting of limu, ʻopihi, wana (sea urchin), hā ʻukeʻuke (sea urchin) and loli (sea slug or sea cucumber). Remnants of ancient structures, burial sites and a hōlua course associated with this settlement can be found on the trail just to the south of the bay in the State of Hawaiʻi Hoʻona Historic Preserve. This preserve contains graves, houses, and other sites of a late 1800s–1900s Hawaiian settlement. Restoration of this site is underway under sponsorship of NELHA and the Department of Land and Natural Resources Historic Preservation Division.

Presently, properties surrounding Makako Bay include Cellana, Cyanotech, the State of Hawaiʻi Hoʻona Historic Preserve, Keahole Airport, open plots owned by NELHA and other aquaculture businesses. Fishing and ʻopihi gathering still occurs in the area. The limited access to the area is thought to help to keep the fishery healthy, because historically the only access was by boat, or permission to enter was given by someone who worked on the surrounding ranch. Cultural activities taking place in this area described by a local practitioner includes shoreline fishing, throw nets, canoes and catching ʻōpelu (Honua Consulting 2013). Additionally, the diving in the area is described as excellent and many people come to the area to view manta rays. Access to the bay is critical for these activities, not just for fishing, which includes extraction, but also for feeding the koʻa. The County of Hawaiʻi has not identified any

public access points for Makako Bay from shore. Wawaloli Beach, just south of the Bay, and Keahole Point, just north of the Bay, are identified as the closest public access points to Makako Bay (http://www.hawaiicounty.gov/pl-n-kona-map2, http://www.hawaiicounty.gov/pl-n-kona-map1).

This bay, known locally as "Garden Eel Cove," is a popular boat dive site due to the garden eels that are found in the sandy substrate. Dive boats also come here in the late afternoon and evening to dive with manta rays. The Kona Bluewater Farms aquaculture pens are located directly offshore from this site and their operations can be observed from shore. There are also other activities that occur here, including capturing fish to sell to the tropical fish aquarium industry.

The recreational activities currently taking place at Makako Bay include fishing; subsistence gathering of ocean resources by cultural practitioners; canoe activities, including fishing from canoes; use of the view plane; swimming/snorkeling; kayaking; worship of ancestral guardians (specifically hāhālua, or manta ray); and lā ʻau lapaʻau.

3.4.5.2 Maui

La Perouse Bay

La Perouse Bay is referred to as Keoneʻōʻio in the Native Hawaiian language. The name Keoneʻōʻio refers to the ʻōʻio, or bonefish (*Albula vulpes*), which was once abundant in the bay (DLNR 2012). References to fishing in ancient Hawaiian stories often describe the Moʻi (king or ruler) of Hawaiʻi Island, Kauhalanuimahu, building a fishpond at Keoneʻōʻio, while he was residing in Honuaula, Maui. The French explorer, Francois de Galaup, Comte de la Perouse, was the first European to land on Maui in Keoneʻōʻio (later called La Perouse Bay) on May 30, 1786. Accounts of his landing indicate that there were five villages along the La Perouse Bay shoreline, which likely describe the cluster of villages found in the Keoneʻōʻio Archeological District that is registered on the State Register of Historic Places. This district includes two heiau; a koʻa; a possible hale mua (men's eating house); a large water well with two sections; as many as five long, narrow enclosures that may have served as canoe sheds; and several possible graves (http://www.nps.gov/pwro/piso/laperos/laperos5.htm#append).

In 2001, the National Park Service studied the suitability and feasibility of including lands extending along the southwestern coast of Maui from Keoneʻōʻio to Kanaloa Point in the National Park System. This included an evaluation of the area applying the National Historic Landmarks process contained in 36 CFR Part 65. The study found that the resources available within the area did not meet the test of national significance; however, it also found that the Hawaiian archeological and coral reef resources in the study area do appear to be of statewide significance. The National Park Service identified throughout the report that the sheer number of visitors to the site compromised the Hawaiian archeological resources, and recommended that the State take measures to protect these resources (http://www.nps.gov/pwro/piso/laperos/laperos5.htm#append).

As noted in the name, Keoneʻōʻio is known most prominently for its bountiful fishing sites. Traditional activities include fishing, subsistence gathering of ocean resources by cultural practitioners, canoe activities, traditional recreation, gathering of cultural resources for spiritual

and cultural protocols, lāʻau lapaʻau, healing and cleansing rituals, ancestral caretaking and worship, worship of akua and aliʻi, care of burial sites and care of historical sites (Honua Consulting 2013). In addition, there are also regular navigation practices, collection of limu, paʻakai, ʻōpihi and other cultural resources, and educational activities. The northwest shoreline of the bay is privately owned, and a native Hawaiian family has lived in their home there for several generations. The home has a small boat ramp that is used primarily for ingress and egress to access traditional fishing grounds located outside of the bay (J. McDonald, DLNR ranger, personal communication, November 2007). Maui County identifies La Perouse Bay as a public access point for this area (http://www.co.maui.hi.us/documentcenter/view/8198) (lat/long: 20.602683 and -156.422910). In addition to the cultural uses described above, surfing, fishing, free diving and spearfishing are other ocean uses occurring at this site. Surf breaks include Laps, Carters, and Voodoos.

3.5 Description of Affected Industries

This section provides general information about businesses potentially affected, either directly, or indirectly, through the implementation of any of the action alternatives. For a more thorough description, see the 2018 Economic Data Report, found in Appendix F.

The 2018 Economic Data Report compiled information about business operations for commercial boat tours, dolphin spiritual retreat tours, and kayak businesses operating in 2017. The researchers who developed the report collected the information through background research and interviews with persons operating many of these businesses on Kauaʻi, Oʻahu, Maui, and Hawaiʻi and the report contains considerable information on the industry in operation at that time. The RIR provides some updates to this industry, particularly with regard to the composition of the industry and updated estimated numbers of businesses.

Whale and dolphin watching businesses, dolphin swim spiritual retreats, snorkel tours, SCUBA companies and kayak tours/rentals are likely to see a greater effect on their businesses, since they are the most dolphin-directed. Other ocean recreation companies (jet ski, SUP, outrigger and others) may be affected because there is an opportunity to see dolphins while on these platforms. They will be affected to a lesser extent are not focused on dolphins, as are the other businesses listed.

Participants of dolphin directed activities may also support other industries indirectly, including lodging, food industry, and car rentals. Many dolphin-swim participants may travel to Hawaii and participate in a wide variety of other ocean based activities, including vessel based wildlife viewing. Weiner (2016) found that 78% of participants of swim-with dolphin tours would still participate in a dolphin tour, even if they could not go in the water with dolphins. The industries that provide goods and services to visitors could potentially see some loss in revenue if new regulations were implemented that prohibited swimming with dolphins. However, many of these businesses serve a much larger number of local, U.S., and international visitors to the state seeking a wide range of experiences, of which direct encounters with dolphins are a small component.

In recent years, tourist-dependent industry involving direct human interaction with Hawaiian spinner dolphin groups (also referred to as "swimming with dolphins" operations) has emerged on four of the seven inhabited MHI: Kauaʻi, Oʻahu, Maui, and Hawaiʻi.

Depending on the activity, location and anticipated degree and proximity of interaction with dolphins, the revenue earned from those possibilities of interactions may vary. These include dive and snorkeling boats that can charge a fee per head or charter fee for use of the vessel, some of which enable opportunities to swim with dolphins; general tour boats that charge a fee per head; and spiritually linked tour operations that charter vessels to transport customers as part of an overall per person package consisting of airfare, lodging, swimming with Hawaiian spinner dolphins and other activities. The majority of the general tour boats also derive revenue from whale watching and sightseeing operations, while a number of the dive/snorkel vessels offer snorkeling or diving trips to prospective customers. Spiritual tours, in many cases, offer yoga, meditation, whale watching and other activities, in addition to swimming with the dolphins.

Most motorized vessels bringing clients to swim with dolphins range from approximately 22 to 42 feet in length and may carry between 6 and 81 people, according to the 2007 Economic Data Report (Impact Assessment, Inc. 2007). By comparison, tour vessels that offer more generalized wildlife viewing tend to be larger than those that focus on close interactions with spinner dolphins. Based on the 2018 Economic Data Report, these generalized tour vessels might range between 27 and 130 feet in length with a maximum carrying capacity ranging between 25 and 400 people, with an average maximum capacity of 99 passengers. Kayaks are smaller and can carry only one or two passengers, on average. The spiritual tours often charter known spinner dolphin viewing tour company vessels, which tend to be smaller. Swimming- from-shore guides generally drive or walk customers to locations where spinner dolphins are known to inhabit and may or may not enter the water with them. At least one of the spiritual-linked firms offers encounters of this type.

The researchers who compiled the information in the 2018 Economic Data Report estimated the number of businesses potentially enabling tourists and local residents to interact with Hawaiian spinner dolphins. NOAA has also maintained an ongoing list of companies that enable interaction with spinner dolphins to some degree. It appears that in the time between when the 2007 Economic Data Report came out and when the new data was gathered in 2017, there has been an overall gain in the number of dolphin tour companies. For example, the number of companies on Hawaiʻi Island has significantly increased. This increase includes companies whose primary activity was not dolphin-directed in the past, such as SCUBA companies, but have added swimming with or watching dolphins to their current menu of activities offered. Table 7 presents the trends in the number of these dolphin-related businesses in Hawaiʻi from 2007 to 2017. Tables 8 and 9 provide a snapshot of industries that allow for spinner dolphin interactions.

Table 7: Trends in the Number of Active Tour Operations: 2007-2017

Type of Business	Hawai'i		Maui		O'ahu		Kaua'i	
	2007	2017	2007	2017	2007	2017	2007	2017
Spiritual Retreats Facilitating Close Proximity Underwater Encounters	5	47	1	0	0	0	1	0
Commercial Boat Tours Facilitating Close Proximity Underwater Encounters	6	47	0	0	8	7	0	0
Commercial Boat Tours Known to Opportunistically Provide Dolphin Viewing Experiences from Above the Water Column	9	*	~20	16	~28	*	~11	15
Universe of Commercial Tour Boats that May Encounter/Interaction with Spinner Dolphins During Routine Operations	100†	266††	117†	123††	196†	28††	59†	49††

*Enumeration of the generalized commercial boat tour fleet that opportunistically provides dolphin viewing experiences from above the water column was not a focus of the 2017 study as it was undertaken on Hawai'i Island or O'ahu; †Data from the Division of Boating and Ocean Recreation for 2003; †† Data from the Division of Boating and Ocean Recreation for 2016-2017 for West Hawai'i, West Maui, Leeward O'ahu, and Nā Pali region of Kaua'i only.

The two datasets collected for estimated total gross revenues are compared in the following table, by island. The data collected in 2007 for the boat tours was broken down into direct and indirect interactions; these were lumped together for ease of comparison. The 2017 estimate for Hawaii Island is extrapolated from data provided by 22 operators, and reflects the average gross revenues reported ($245,670) times a total of 47 operators. There was no dataset gathered on gross revenues for the island of Maui in 2017 because there were not enough respondents to the requests for information to allow for a valid analysis. All Maui tours reported in 2007 were vessel-based encounters, not swim-with dolphin tours. Although the number of tour operators did not significantly increase on Oahu, the revenues doubled. Also of note is the fact that although all dolphin-oriented tours on Kauai were vessel-based and did not offer swim-with dolphins, these tours have increased their 2017 revenues by more than double over 2007.

Table 8: Estimated Total Gross Revenues for Various Businesses Offering Dolphin-Oriented Services

Type of Business	**2007**	**2017**
	Hawaii Island	
Boat Tours Providing In-Ocean Dolphin Encounters	$725,000	$11,546,526
Spiritual Retreat Businesses	$591,735	$8,937,231
Total Gross Revenues	**$1,316,735**	**$20,482,757**
-	**Maui**	
Tours Providing Vessel-Based Dolphin Encounters	**$20,699,913**	-

Type of Business	2007	2017
	Oahu	
Boat Tours Providing In-Ocean Dolphin Encounters	**$5,632,747**	**$11,511,809**
-	Kauai	
Tours Providing Vessel-Based Dolphin Encounters	**$9,325,000**	**$22,165,804**
Total Gross Revenues All Islands	**$36,974,395**	**$54,161,370**

One other important aspect of the economic studies is the numbers of employees and wages paid. The following tables compare the reported differences between 2007 and 2017 numbers. Comparisons between the two datasets are slightly different in that 2007 collected mean number of employees and wages paid, verses average number of employees in 2017 and wages ranges were broken down by captain versus crew. This data was not collected for Maui in 2017.

Table 9: Number of Employees and Hourly Wages for Boat Tours Providing Dolphin Encounters

2007		2017		2007	2017	
Total Employees	**Mean Employees**	**Total Employees**	**Average Employees**	**Mean Hourly Wages**	**Captains Wages**	**Crew Wages**
Hawaii Island						
74	3-20	142	7	$16-22	$19-25	$12-14
Maui						
153	4-20	-		$19	-	
Oahu						
176	10-25	-	22 (mean)	$16-19	$15-30	$12-20
Kauai						
119	8-20	162	18 (mean)	$19	$20-35	$10-18

Restrictions resulting from the COVID pandemic have significantly impacted the tourism industry in Hawaii. Following the onset of the COVID pandemic and restrictions that began in March 2020 to slow the spread of COVID-19 in the state, a total of 4,564 visitors arrived in Hawaii, a 99.5% decrease from the number of visitors that arrived in April 2019 (https://www.hawaiitourismauthority.org/media/4635/april-2020-visitor-statistics-press-release-final.pdf). While tourism has increased in the state over the last year with 171,976 visitor arriving in Hawaii in January 2021, this number represents a 70% decline compared to January 2020 (https://www.hawaiitourismauthority.org/media/6832/january-2021-visitor-statistics-press-release-final-2.pdf). As a result, the tourism industry has faced immediate financial challenges and businesses that rely on tourists, such as boat-based wildlife viewing tours, snorkel tours, and spiritual retreats have been financially impacted from the COVID pandemic. Although it is not known when tourism will return to pre-COVID levels, we anticipate that that dolphin directed activities would resume to pre-pandemic levels in the future.

Chapter 4 - Environmental Consequences

4.1 Introduction

This chapter describes the potential impacts on those resources identified in Chapter 3 (Affected Environment) from implementing the identified alternatives described in Chapter 2 (Alternatives 1–5). Specifically, the analyses describe the expected conditions under the various alternatives when compared to existing baseline conditions described in Chapter 3, Affected Environment.

The terms “effects” and “impacts” are used synonymously under NEPA; therefore, throughout this chapter both terms will be used interchangeably. Under the 1978 CEQ NEPA Regulations, which is used to prepare this FEIS, effects include direct effects, which are caused by the action and occur at the same time and place; indirect effects, which are later in time or farther removed in distance or location (but still reasonably foreseeable); and cumulative effects, which are those impacts that result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions (regardless of what agency or person undertakes such actions). Over time, individually minor actions may collectively affect a resource. A cumulative effects analysis attempts to consider the full range of consequences of an action in order to ensure better long-term planning of potential impacts. A discussion of cumulative effects appears in section 4.5.

Under the No Action Alternative, existing general prohibitions under the MMPA would continue, and NMFS would continue to promote responsible wildlife viewing under the voluntary guidelines through the Dolphin SMART program (section 1.3.3.1) and through additional methods of education and outreach. Under all of the action alternatives, NMFS would promulgate enforceable regulations; the anticipated impacts of these regulations are discussed in comparison to the No Action Alternative. The analysis also discusses how the various alternatives compare with each other where that comparison is relevant and informs decision-making.

NMFS anticipates that each action alternative has some potential to prevent or reduce the threat of take occurring (including harassment and disturbance), though the magnitude of the reduction will vary based on type and number of activities that the measure is capable of addressing. NMFS anticipates that a reduction in disturbance will have a positive impact on the spinner dolphins. NMFS described the observed levels of compliance qualitatively in Chapter 3; actual estimates of harassment and/or intentional disturbance that could be prevented by implementing each alternative cannot be calculated at this time. However, under current conditions, Hawaiian spinner dolphins are disturbed regularly by vessels and swimmers that seek interactions with wild dolphins (Forest 2001, Östman-Lind 2004, Danil *et al*. 2005, Courbis 2007, Timmel *et al*. 2008, Milette *et al*. 2011, Wiener 2016, Heenehan *et al.* 2018).

4.2 Impacts to Hawaiian Spinner Dolphins

Throughout section 4.2, dolphin-directed activities that cause take are categorized into three human threat types (listed below) that have been found to cause disturbance to spinner dolphins or disruptions to spinner behavioral patterns. Each alternative is then evaluated qualitatively to describe the degree to which the prohibitions may change disturbance associated with each type of threat, and the overall impacts of this change to Hawaiian spinner dolphin behaviors, habitat use and the overall population.

Threat Types:

- **Swim-with** interactions - human activities that involve closely pursuing or approaching spinner dolphins to swim near the animals or activities that include people floating in the water with the intent of having the animals swim nearby.

- **Vessel/watercraft** interactions – all vessel and watercraft that are engaged in activities that involve closely approaching spinner dolphins or activities that include placing vessels or watercraft on a path to cause a close encounter with spinner dolphins.
- **Unmanned aircraft system (UAS) or drone** interactions – all drones that approach or pursue spinner dolphins.
- **Intensity of activity in targeted essential daytime habitats** – all activities in or on the water inside essential daytime habitats, especially those that are dolphin-directed, that reduce the quality of the habitat by diminishing the dolphins' ability to use the resources in these areas for daytime behaviors including resting, nurturing young, socializing, and avoiding predators.

4.2.1 Alternative 1 – No Action

Under the No Action Alternative, NMFS would take no new regulatory action to enhance protections for Hawaiian spinner dolphins from dolphin-directed activities that cause take, including harassment or disturbance to spinner dolphins. NMFS would continue supporting existing education and outreach programs through PIRO and the NMFS-sponsored Dolphin SMART program (section 1.3.3.1). Existing laws under the MMPA would continue to prohibit take and NMFS would continue to enforce those prohibitions. It is likely that the amount of disturbance to spinner dolphins from people seeking to swim-with, and closely approach on vessels and watercraft will continue.

Since the emergence of this dolphin-focused tourism industry in Hawai‘i, both the number of operators and the number of people participating in wild dolphin excursions have increased (Boehle 2007, O'Connor *et al*. 2009, Hu *et al*. 2009, Impact Assessment, Inc. 2018). O'Connor *et al*. (2009) reported 120,000 tourists participating in dolphin-directed tours per year, and 390,000 tourists per year participating in other tours (kayaking and snorkeling tours, for example) that opportunistically watch dolphins. In addition, residents and visitors seek out these opportunities unassisted by tour operators. With the recent implementation of the Dolphin SMART program on O‘ahu, Kaua‘i, and Maui, five commercial tour businesses have pledged compliance to voluntary standards for responsible dolphin viewing, operating and advertising. However, with the increased interest in wild dolphin encounters, it is unlikely that there will be a net decrease in disturbance resultant from this program alone. Further, one Dolphin SMART operator left the program in 2015 because the business felt they could not compete with operators who advertise close encounters and even "swim with dolphin" programs. In the absence of specific regulations, it is likely that incidents of disturbance will continue at least at current levels and could continue to increase. Although COVID impacts have reduced the number of visitors to Hawaii, tourism has increased since March 2020 when COVID restrictions began and the number of vistors to Hawaii declined. It is not known when tourism will return to pre-COVID levels; however, we anticipate that dolphin directed activities would resume to pre-shutdown levels in the future.

4.2.1.1 Behavioral Response

Under the No Action Alternative, disturbance to Hawaiian spinner dolphins in and around essential daytime habitats is expected to continue; thus, NMFS expects spinner dolphin

behavioral responses and changes to group behaviors to continue. As noted in section 1.4.2, behavioral studies of Hawaiian spinner dolphins do not span several generations, therefore, information is lacking to determine if long-term impacts to fitness are already occurring. However, studies demonstrate disturbance of individual spinner dolphins as well as changes to spinner dolphin group behavior patterns over time (Forest 2001; Ostman-Lind *et al*. 2004; Courbis 2004, Danil *et al*. 2005, Courbis and Timmel 2009, Heenehan *et al*. 2017; Ostman-Lind *et al*. 2004; Ostman-Lind 2009; Thorne *et al*. 2012). Individual responses indicate that spinner dolphins are diverting time and energy from fitness-enhancing behaviors or activities, such as socializing, resting and parental care to respond to swimmers and vessels. In addition, changes to overarching behavioral patterns within essential daytime habitats demonstrate that resident populations are altering group behaviors to avoid these threats. Changes to these patterns results in longer-term impacts that include the reduction of overall time spent in resting areas, reductions in dive periods (which are indicative of resting behavior), reductions in group sizes using resting areas, and habitat displacement within and among resting areas (Forest 2001, Danil *et al*. 2005, Östman-Lind *et al.* 2004). Current levels of tourism exposure were evaluated in a spinner dolphin energetic modeling study to determine if the costs associated with these stressors may leave Hawai‘i’s spinner dolphins’ energetic budget at a deficiency (Symons 2013, Johnston *et al*. 2014). Although the study indicated that resident populations are likely meeting their daily requirements for rest, it noted that any increase in exposure could result in a deficit that could affect the fitness of individuals. It further notes that energetic costs, such as growth and lactation, were not factored into the model and that these types of activities are known to increase energetic needs (ranging from 10-100%) in other species; therefore, some individual dolphins, including reproductively active females and young, may already be at risk (Symons 2013).

The nature of Hawaiian spinner dolphin viewing is such that tour companies repeatedly single out specific populations of animals for close-up encounters due to the animals’ predictable occurrence in essential daytime habitats. Spinner dolphins using essential daytime habitats targeted by people wanting to interact with the dolphins are often subject to intense spinner dolphin-directed activity, putting them at high risk for cumulative stress and disturbance events throughout daytime hours when they would normally be resting, nurturing young or socializing. Under the No Action Alternative, long-term behavioral changes are likely to be expressed the most by spinner dolphins using these essential daytime habitats. Cumulative impacts from these shifts in behavioral and energetic budgets are discussed below (see section 4.2.1.3).

4.2.1.2 Habitat Use

As noted above, specific essential daytime habitats have become targets for close-up encounters with Hawaiian spinner dolphins because these areas are predictably used by these dolphins and convenient to access for such activities. NMFS anticipates that, at a minimum, the current levels of disturbance within these essential daytime habitats would continue under the No Action Alternative; incidents of disturbance may also increase based on predicted trends.

Behavioral ecologists often compare animals faced with disturbance stimuli to those making decisions in terms of predation risk (Frid and Dill 2002, Bejder 2006a). This is similar to a cost/benefit analysis in which the costs of disturbance (or repeated disturbance) within a habitat are weighed against the benefits the animal receives from the resources within that habitat. The

decision to flee is influenced by other factors that the animal faces, including the availability, distance and quality of suitable habitat elsewhere, and the animal's current body condition (weak individuals may not have the energetic resources available to flee) (Frid and Dill 2002, Bejder 2006a). If the animal is constrained in the availability of other suitable habitat or it is in poor condition, then it may remain within the habitat that has become costly to its overall health and fitness (see section 4.2.1.3).

Additionally, tolerance to disturbance of particular individuals varies by individual; some individuals may be more sensitive to disturbance and more likely or able to flee disturbed habitats. Researchers previously reported that some Hawaiian spinner dolphins might have already met their threshold of disturbance within essential daytime habitats, resulting in changes to group size and habitat use for spinner dolphins using Kealakekua Bay (Forest 2001, Östman-Lind *et al.* 2004). Other researchers have reported similar responses in other well-studied dolphin populations, including documented habitat displacement from preferred resting and near-shore areas (Bejder *et al*. 2006a, Lusseau 2004, Nature Conservation Sector 2006, Lusseau and Bejder 2007). Over time and under the No Action Alternative, individuals and/or entire groups of spinner dolphins could be displaced from essential daytime habitats if their disturbance thresholds are met. Fleeing from optimal habitats may place higher energetic demands on animals if they have to work harder to sustain themselves in the new habitat. The impacts on individuals and the overall population from habitat displacement are discussed below.

4.2.1.3 Overall Effects on Individuals and Effects on the Population

When Hawaiian spinner dolphins respond to disturbance events, they incur an energetic cost, which may be in the form of the energy expended to respond to the disturbance event, or energy that was not restored due to lack of rest. At this time, there is insufficient information to quantify the total amount of time or energy expended by spinner dolphins due to short-term disturbance because NMFS lacks the detailed data necessary to determine impacts to individuals' behavioral and energetic budgets. Johnston *et al*. (2014) used a theoretical model to calculate the resting requirements for spinner dolphins based on their estimated energy consumption requirements. This model predicts spinner dolphins that spend less than 40% of their time resting while in bays faced an energetic debt for the day. Tyne (2015), who studied spinner dolphins along the Kona coast of Hawai‘i Island, noted that the spinner dolphin population there is chronically exposed to human tourism activities more than 82% of the time during daylight hours. Under the No Action Alternative, this level of spinner dolphin-directed activity and associated disturbance is expected to continue as tourism returns to normal pre-COVID levels, and spinner dolphins are expected to continue to experience the energetic costs associated with changes to their behaviors both in short-term (disturbance responses) and long-term responses (changes to behavior patterns and fitness).

Important fitness-enhancing behaviors occur daily within essential daytime habitats, and disruptions (from human disturbance) to these behaviors result in deficiencies in an animal's ability to rest, socialize, and nurture its young. Similar to most animals, inadequate amounts of rest over time could affect a dolphin's growth, reproduction, and health. For example, disruptions

to rest or reduced resting periods may affect an animal's foraging efficiency. This could result in impacts to the overall body condition and health of the animal. Animals in poor body condition may be subject to decreased growth and development, reduced reproductive fitness, reduced ability to nurture or to provide adequate nutrition for their young, poor immune response, and/or reduced vigilance for predators. Additionally, individuals or groups of Hawaiian spinner dolphins could be displaced from important habitat when disturbance levels exceed their tolerance thresholds. Displacement to less optimal habitat may also result in negative physiological effects, such as poor health and reduced reproductive rates, on individuals and the population. Bejder (2005) suggests resident, closed, or isolated populations (i.e., local populations with barriers to gene flow, similar to Hawaiian spinner dolphins) are more at risk from negative stressors, such as disturbance from human activity that may lead to displacement, because the impacts to multiple individuals' health and fitness are quickly reflected in the overall fitness of the population. Spinner dolphins also exhibit spatially and temporally constrained behavioral patterns and have high fidelity to specific daytime resting and evening foraging areas (Norris & Dohl 1980; Norris et al. 1994; Benoit-Bird & Au 2009; Thorne et al. 2012; Tyne et al. 2015). The ability of a population to adapt and persist through a disturbance is measure of its resilience (Hollins 1973), and populations that are more constrained, such as island-associated stocks of Hawaiian spinner dolphins, are less resilient to disturbance than populations that exhibit more flexible behavioral strategies (Lusseau et al. 2009). Accordingly, the rigid daily cycle of small resident spinner dolphin populations of the MHI makes them more vulnerable to negative impacts from human disturbance (Tyne et al. 2017).

The above range of physiological impacts is predicted for animals that remain in disturbed habitats. Alternatively, some Hawaiian spinner dolphins may be displaced from essential daytime habitats due to the continued levels of disturbance or the potential increase of disturbance under the No Action Alternative. Dolphins appear to prefer essential daytime habitats because of the favorable environmental conditions for resting and the close proximity to prey resources (Norris and Dohl 1980, Thorne *et al*. 2012). The energetic costs of foraging could increase if displaced dolphins are forced to travel farther from new resting areas to reach prey aggregations at night. Additionally, environmental conditions in other areas may not be as suitable for predator detection, and spinner dolphin populations may need to increase vigilance for predators or may experience increased rates of predation. Increases in travel distances or increased need for vigilance could affect the energetic budget of these dolphins.

Group functioning in spinner dolphins is evident in multiple components of daytime behavior including foraging, resting, and nurturing; therefore, disturbance impacts to the group as a whole should also be considered. Norris *et al*. (1994) described the schooling behavior of Hawaiian spinner dolphins as a *supraindividual* system where individual spinner dolphins benefitted from the use of group patterns to effectively deal with predators. Daily disruptions to group behaviors (due to disturbance events or changes in behavioral or energetic budgets) could leave some individuals, especially the young, more susceptible to predation. Additionally, disruptions of bonds through displacement of specific individuals could have repercussions to the overall foraging success and health of the group.

Because human interest in activities associated with participating in wild dolphin tours has been steadily increasing (Boehle 2007, OConnor 2009, Hu *et al*. 2009), NMFS anticipates that human

interactions with Hawaiian spinner dolphins will increase with time rather than remain at the status quo under the No Action Alternative. Restrictions resulting from the COVID pandemic have significantly curtailed wild dolphin tours. Although it is not known when State restrictions will be relieved, we anticipate that those activities would resume to pre-shutdown levels in the future. As indicated above an increase in disturbance threats could leave individuals at an energetic deficit affecting the fitness of those animals and some mothers and juveniles may already be at risk of reduced fitness (Johnston *et al*. 2014). NMFS anticipates that impacts to resident Hawaiian spinner stocks will reflect those of other small cetaceans, either through habitat displacement and/or in further deficits to the behavioral and energetic budgets of these dolphins, and that impacts will be reflected in the overall fitness of these small resident populations.

Many independent scientists studying spinner dolphins in Hawaii, have reported changes in spinner dolphin behavior or reduced time spent engaging in resting behavior when in the presence of human activity (Norris et al. 1994; Lammers 2004; Danil et al. 2005; Courbis 2007; Courbis and Timmel 2009; Timmel et al. 2008; Forest 2001; Heenehan et al. 2017; Ostman-Lind et al. 2004; Ostman-Lind 2009; Thorne et al. 2012; and Wiener 2016). Although these studies focused on individual responses to disturbance, rather than population effects, high levels of exposure to human activities have had deleterious impacts on other analogous dolphins and marine mammal species, including habitat abandonment and reduced female reproductive success which have effects on populations (Bejder 2005; Bejder et al. 2006a, 2006b; Lusseau and Bejder 2007; Lusseau 2003; Johnston 2014).

4.2.2 Alternative 2 – Swim-With Regulation

Swimming with Hawaiian spinner dolphins has become a popular activity in many of the dolphins' essential daytime habitats. It is likely that implementation of this measure would appreciably reduce the threat of take (including harassment and disturbance) associated with people swimming within close proximity to spinner dolphins, compared to the No Action Alternative. The implementation of this regulation would not directly address other activities that additionally cause disturbance to spinner dolphins, including spinner dolphin-directed vessel activities or other spinner dolphin viewing-related recreational activities on other watercrafts. With swimming prohibited, some essential daytime habitats may experience an appreciable reduction in the intensity of activities in the areas; however, some people may seek other opportunities to closely interact with spinner dolphins, such as by vessel. This could result in a slight increase in disturbance associated with close approach of vessels in some areas, although it is difficult to determine to what degree activities may be displaced from one platform to another or in which areas this type of displacement is most likely to occur. Reductions or increases in the intensity of disturbance may vary from location to location and may be related to the areas ease of accessibility for vessels. For these reasons prohibitions on swimming activities may not appreciably lessen the intensity of disturbance in essential daytime habitats overall.

In some circumstances, Hawaiian spinner dolphins may approach a person in the water. An exception is proposed for swimmers that are approached by spinner dolphins at distances within 50 yards. Swimmers who inadvertently find themselves within 50 yards of a spinner dolphin, or who are approached by spinner dolphins, must make no effort to engage or pursue the animals, and must take immediate steps to move safely away from the animals. Disturbance effects from

these types of activities are expected to be less common and have little impact on the long-term fitness of resident populations.

4.2.2.1 Behavioral Responses

Research has shown that the behavior of Hawaiian spinner dolphins changes with the presence of swimmers (Forest 2001, Courbis 2004, Danil *et al*. 2005, Johnston *et al*. 2014). Spinner dolphins often show avoidance behaviors around swimmers and are intolerant of prolonged interactions (Timmel 2008). Spinner dolphins that do interact with swimmers do so at an energetic or behavioral cost, and the time for restorative or fitness-enhancing behaviors — particularly rest — is lost due to these disruptions. NMFS anticipates that Alternative 2 will appreciably reduce the threat of take (including harassment and disturbance) caused by shore-based swimmers and vessel-based swimmers, compared to the No Action Alternative. With reduced disturbance from swimmers, the energetic costs associated with these disturbance responses will be lessened, and energy spent reacting to this type of threat may be redirected to fitness-enhancing behaviors. Nonetheless, this regulation does not directly address disturbance from other threats, such as close approach by vessel, which may cause disturbance resulting in behavioral responses by spinner dolphins and could continue to result in changes to daytime behavior patterns. Accordingly, under Alternative 2, spinner dolphins will still experience some disruptions to their energetic budgets and only small benefits are expected as a result of implementing this alternative alone.

4.2.2.2 Habitat Use

Hawaiian spinner dolphin resting habitat, especially essential daytime habitats, are likely to remain the target for close viewing opportunities via vessels and other platforms, and NMFS expects activities within easily accessible essential daytime habitats to remain high. Boater interactions in important habitats also cause avoidance of those habitats in other resident populations of dolphins (Lusseau 2004, Gannier and Petiau 2006). It is difficult to determine to what degree the reduction in swimmer-related disturbance alone will influence spinner dolphins' use of essential daytime habitats in Hawai‘i because of the continuation of other dolphin-directed activities in those areas, the potential for swim-with activities to be displaced to vessel activities in some areas, and the variation in tolerance thresholds among individual spinner dolphins. The reduction in swimmer-related disturbance in some areas may encourage some individuals to remain in essential daytime habitats or encourage individuals to return to resting habitats that they had previously abandoned. Increases in vessel activities in certain areas are expected to result in impacts similar to those anticipated under the No Action Alternative, with weaker individuals remaining in the area, and some fleeing because the cost of obtaining resources in the bay have exceeded the benefits.

4.2.2.3 Overall Effects on Individuals and Effects on the Population

As noted in the discussion above, the implementation of this alternative may have different outcomes in different areas. Prohibiting people from swimming with Hawaiian spinner dolphins is likely to have benefits to spinner dolphin individuals and the population in some areas in comparison with the No Action Alternative. NMFS anticipates the costs of disturbance and

associated behavioral responses to lessen and the dolphins to spend more time engaged in important fitness-enhancing behaviors. This may benefit spinner dolphins' individual health, and even contribute to the health of the population because individuals influence the success of group activities, such as foraging and vigilance during resting periods. NMFS expects Alternative 2 to alleviate some of the disturbance that threatens the long-term health of resident populations, however it is uncertain to what degree the elimination of this one threat will protect spinner dolphins from the impacts associated with long-term disturbance caused by intense activity in essential daytime habitats or other activities, such as close approach by vessels. Resident populations may remain at risk if these other factors are not adequately addressed and long-term impacts may include habitat displacement and reduced fitness leading to population declines.

4.2.3 Alternative 3 –Swim-With and Approach Regulations

Seeking out Hawaiian spinner dolphins for close approach opportunities, including swimming with the animals, has become a popular activity in many of the dolphins' essential daytime habitats. Considering the effectiveness, enforceability, and the clarity of an approach rule, it is likely that implementation of either Alternative 3(A) or 3(B) would appreciably reduce the threat of take (including harassment and disturbance) associated with close approach activities to Hawaiian spinner dolphins, and would allow the dolphins a reprieve from close human interactions. Compared with the No Action Alternative, both Alternative 3(A) and Alternative 3(B) are expected to be effective at preventing disturbance within close proximity to spinner dolphins. In comparison with Alternative 2, they provide a greater reduction in disturbance because they also enhance protections for spinner dolphins from disturbance associated with close approach by vessels engaged in spinner dolphin-directed activities.

Exceptions exist for the approach prohibitions (see section 2.1.1.2). Federal, State, or local government vessels, aircraft, personnel, and assets operating in the course of official duty and vessel operations necessary to avoid an imminent and serious threat to a person or vessel may inadvertently approach spinner dolphins within the minimum prescribed distance. Dolphins may exhibit short-term or temporary responses to avoid vessels that closely approach in these types of circumstances; however, the risk of long-term behavioral responses or habitat abandonment is unlikely because the events are expected to occur infrequently and are unlikely to reoccur in the same location over an extended period.

In Appendix A NMFS identified three harbor areas where Hawaiian spinner dolphins are known to rest near the harbor entrances. Vessels will not be prohibited from transiting to and from harbors to allow for regular navigation; however, vessels will not be allowed to idle or stop near spinner dolphins unless necessary for the safe operation of the vessel. While these activities may allow for close approach of spinner dolphins and some level of disturbance may occur from these activities, the idling limitations attempt to mitigate circumstances that would prolong close interactions or stress on these animals.

In some circumstances, Hawaiian spinner dolphins may approach a vessel or person in the water. Exceptions are proposed for vessels and swimmers that are approached by spinner dolphins at distances within the minimum prescribed distance to alleviate the regulatory burden on ocean users that are not engaged in dolphin-directed activities. Vessels that are underway and approached by spinner dolphins (*e.g.*, for bow riding) must continue normal navigation and make

no effort to engage or pursue the animals. Swimmers who inadvertently find themselves within the minimum prescribed distance of a spinner dolphin, or who are approached by spinner dolphins, must make no effort to engage or pursue the animals, and must take immediate steps to move safely away from the animals. Although a close interaction in these circumstances could inadvertently result in a disturbance to an individual spinner dolphin, if for example the swimmer or vessel were to quickly change directions, these situations are dolphin-initiated and generally unlikely to cause a disturbance to important daytime behaviors that support rest. Disturbance effects from these types of activities are expected to be rare and have little impact on the long-term fitness of resident populations.

An exception will exist for vessels engaged in an activity authorized through a permit or authorization issued by NMFS to take Hawaiian spinner dolphins. This exception is necessary to collect biological data to inform management and conservation decisions regarding dolphins. Further, terms and conditions associated with the permit or other authorization would seek to minimize the potential impacts to dolphins. An exception will also exist for commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c).

4.2.3.1 Behavioral Responses

4.2.3.1.1 Alternative 3(A) –Swim-With and 50 Yard Approach Regulations

As noted in section 4.2.2, close approach by swimmers disrupts spinner dolphin natural behaviors at an energetic cost to these animals. Similarly, vessels approaching spinner dolphins have been shown to elicit disturbance responses, which interrupt natural fitness-enhancing behaviors (Forest 2001, Ross 2001). This alternative would reduce the amount of disturbance experienced by Hawaiian spinner dolphins, compared to the No Action Alternative. With close swimmer and vessel activities prohibited, NMFS expects this alternative to greatly reduce the amount of disturbance to spinner dolphins and reduce the amount of time and energy that spinner dolphins expend on those reactions. Under Alternative 3(A), spinner dolphins will be able to focus more time and energy towards fitness-enhancing activities (*e.g.*, resting, socializing, and nurturing of young), which support the health of individuals and resident populations providing appreciable benefits to the spinner dolphins.

A 50 yard approach buffer around spinner dolphins is consistent with well-established national and regional guidelines, such as the recommended viewing distance for the Dolphin SMART program, our regional Responsible Marine Wildlife Viewing Guidelines (publicly available at https://www.fisheries.noaa.gov/pacific-islands/marine-life-viewing-guidelines/viewing-marine-wildlife-hawaii), and our national viewing guidelines for dolphins and porpoises (publicly available at https://www.fisheries.noaa.gov/topic/marine-life-viewing-guidelines#guidelines-&-distances). The 50 yard approach regulation is intended to reduce the degree of behavioral disruption from close approaches by vessels and swimmers, while placing the least restrictive burden on the viewing public. Spinner dolphins exhibit changes and disruptions to natural behaviors from close approach by swimmers (Danil et al. 2005, Courbis and Timmel 2008) and swimmer presence within 150 m reduces the likelihood of spinner dolphins being in a resting

state (Symons 2013, Johnston et al. 2014). Approach by vessels and watercraft have also been shown to disrupt and alter spinner dolphin behavior (Ross 2001, Forest 2001, Timmel et al. 2008). However, a 50 yard approach distance would provide increased protection and safety for these spinner dolphins, has been a recommended viewing distance in long-lasting regional and national guidelines, and will not restrict the public from observing these animals.

4.2.3.1.2 Alternative 3(B) –Swim-With and 100 Yard Approach Regulations

The beneficial effects of Alternative 3(B) on the behavioral responses of Hawaiian spinner dolphins are expected to be greater than those described under 3(A) above, because the increased distance will provide a greater buffer from human activities that result in take and dolphins will have more space to engage in natural behaviors. As described earlier, spinner dolphins exhibit changes and disruptions to natural behaviors from close approach by swimmers within 150 m (Symons 2013, Johnston et al. 2014) and approach by vessels and watercraft have also been shown to disrupt spinner dolphin behavior (Ross 2001, Forest 2001, Timmel et al. 2008). However, not all approaches within 100 or 150 yards are likely to result in take of spinner dolphins, and therefore a 100 yard approach restriction may not be necessary and appropriate to prevent harassment.

4.2.3.2 Habitat Use

NMFS anticipates the reduction in disturbance associated with both Alternative 3(A) and Alternative 3(B) will slightly improve the quality of the resting habitat in comparison with the No Action Alternative, because disturbance events related to close approach by either swimmers or vessels are expected to decrease. However, under Alternatives 3(A) and 3(B) daytime habitats will likely remain targets for spinner dolphin-directed viewing activities, and both dolphin-directed activities and other recreational activities in some areas will remain high, even if outside of the minimum prescribed distance. Thus, habitat-related impacts may still occur to some degree under these alternatives.

4.2.3.3 Overall Effects on Individuals and Effects on the Population

4.2.3.3.1 Alternative 3(A) –Swim-With and 50 Yard Approach Regulations

NMFS expects the reduction of swim with and other close approach activities within 50 yards of Hawaiian spinner dolphins to benefit spinner dolphin individuals and the population in comparison with the No Action Alternative. NMFS anticipates the costs of disturbance and associated behavioral responses to lessen appreciably and the dolphins to spend more time engaged in important fitness-enhancing behaviors. This would likely benefit spinner dolphins' individual health, and contribute to the health of the population because individuals influence the success of group activities, such as foraging and vigilance during resting periods. NMFS expects Alternative 3(A) to alleviate more disturbance than Alternative 2, which only alleviates disturbance from one activity but allows for other intense activities such as close approach by vessels.

4.2.3.3.2 Alternative 3(B) –Swim-With and 100 Yard Approach Regulations

NMFS expects the reduction of swim with and other close approach activities within 100 yards of Hawaiian spinner dolphins to benefit spinner dolphin individuals and the population in comparison with the No Action Alternative, and to also provide incremental benefits compared to Alternative 3(A). NMFS anticipates the costs of disturbance and associated behavioral responses to lessen appreciably and the dolphins to spend more time engaged in important fitness-enhancing behaviors. This would likely benefit spinner dolphins' individual health, and contribute to the health of the population because individuals influence the success of group activities, such as foraging and vigilance during resting periods. NMFS expects Alternative 3(B) to alleviate more disturbance than Alternative 3(A), which only alleviates disturbance from close approach within 50 yards by vessels or swimmers.

While NMFS expects Alternative 3(B) to alleviate a large portion of the disturbance that is considered to threaten the long-term health of resident populations, it is uncertain to what degree the elimination of these activities will alleviate the intense dolphin-directed activity and other recreational activities in essential daytime habitats or disturbance by activities that do not include approaching within 100 yards. While this alternative may be sufficient to prevent long-term impacts to Hawaiian spinner dolphins, some individuals may remain at risk due to the intense activity in essential daytime habitats not being adequately addressed.

4.2.4 Alternative 4 –Mandatory Time-Area Closures in Specified Spinner Dolphin Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 4 would combine the protections associated with swim-with and approach regulations discussed under Alternative 3 (section 4.2.3) and include additional protections as a result of prohibiting the use of five Hawaiian spinner dolphin essential daytime habitats in the MHI during important daytime periods (described in section 2.7). Closure sites under this alternative include four essential daytime habitats off the Kona Coast of Hawai‘i Island: Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay (Ho‘okena), and Makako Bay; and one essential daytime habitat off the coast of Maui: La Perouse Bay (see section 2.7 for selection discussion). Although spinner dolphins use many locations within their range during the day, these particular bays are considered preferred habitat due to regular spinner dolphin use, and are recognized as essential daytime habitats in this document because they support vital dolphin behaviors, such as resting, socializing and nurturing. These proposed sites selected for closure represent areas where information from the scientific literature, NOAA OLE, State of Hawai‘i and scoping indicates that human interactions at these locations are disturbing spinner dolphins on a regular and ongoing basis (see section 2.7 for selection process or Appendix A). It is likely that spinner dolphins using these particular areas are subjected to the highest amount of disturbance, putting these dolphins at the highest risk for long-term physiological impacts from chronic disturbance to behavioral patterns and/or loss of optimal habitat. Alternative 4 would provide a comprehensive set of protections to address ongoing activities that cause disturbance in close proximity to spinner dolphins, as well as provide enhanced protection for spinner dolphins during historic resting times in five essential daytime habitats that are targeted by people wanting to interact with the dolphins (time-area closures). The combination of approach rule protections and time-area closures are expected to appreciably reduce the threat of take (including harassment and disturbance) associated with swim-with and vessel activities as well as reduce

the intensity of activity within core areas of essential daytime habitats. This reduced disturbance to spinner dolphins would allow for increased time spent engaging in fitness-enhancing activities, and ultimately, improvements to the fitness of individuals could lead to improved status of local populations.

Exceptions exist for approach prohibitions, some of which also apply to the time-area closures as well (see section 2.1.1.2 and Table 4). The evaluation of impacts to Hawaiian spinner dolphins from activities that are exceptions from the approach regulations are discussed in section 4.2.3. In addition to the exceptions discussed above regarding approach regulations, some activities are excepted from the prohibitions associated with the time-area closures. These exceptions include (1) vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure, (2) vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure, and (3) outrigger canoes used for traditional subsistence fishing with harvested resources intended for personal, family, or community consumption or traditional use. Each one occurs on an infrequent basis, and is not dolphin-directed. In the discussion of the relevant bays (section 3.4.5) NMFS identifies each exception type of activity that may occur. Although dolphins may exhibit short-term or temporary responses to avoid vessels engaged in these activities, the risk of long-term behavioral responses or habitat abandonment is unlikely because the events are expected to occur infrequently and are unlikely to reoccur in the same location over an extended period.

4.2.4.1 Impacts from Buoy Installation

The installation and maintenance of buoys for the delineation of the five time-area closures may present some risk of entanglement to Hawaiian spinner dolphins using these resting areas. To prevent the risk of entanglement, NMFS will use the minimum amount of line necessary to account for fluctuations in water depth due to tides and waves for securing the buoys. This precaution will ensure that lines are vertical and as taut as possible to avoid the formation of loops and prevent entanglement, while not compromising the efficacy of the anchoring system. In addition, NMFS will implement a maintenance schedule to inspect the lines and buoy system to ensure that parts are maintained and replaced as necessary, maintaining the integrity of the system and minimizing the risk to marine wildlife.

Additional impacts to Hawaiian spinner dolphins from the demarcation buoys may occur for short time periods during the installation and maintenance processes, including disturbance from human activity and equipment operation, vessel collision, separation or group scattering in response to vessels while equipment is being deployed or during maintenance procedures, and exposure to vessel wastes and discharge. Exposure to buoy installation activities has the potential to startle spinner dolphins due to increased noise or activity, which may cause spinner dolphins to avoid the source of the noise or activity during installation. Since these activities will be temporary and relatively short-lived, no chronic long-term impacts are anticipated.

Spinner dolphins are highly sensitive to movement within their environment and are capable of rapid movements. The likelihood of vessel collisions with this species is lower than for slower moving species; however, boats moving through a resting area have the potential to cause group

separation or scattering, which may place separated individuals at a higher risk of predation and disrupt those behaviors that may have been occurring before group separation occurred. Vessel operators conducting installation and maintenance activities will be required to take appropriate measures — decreasing speeds within the resting bays and maintaining a minimum prescribed distance from spinner dolphin groups — to avoid this type of impact. Exposure to wastes and discharge from vessels used to deploy or maintain buoys could diminish the quality of resting habitat for spinner dolphins, but NMFS will take measures to avoid these types of exposures in accordance with Appendix C.

NMFS will employ the *NMFS Protected Resources Division Best Management Practices for General In-Water Work Including Boat and Diver Operations* to reduce the potential for all of the identified adverse effects on protected marine species while the buoys are being installed or maintained. These practices are described in Appendix C and are intended to promote watchfulness to prevent disturbance and unintentional harm to protected species, while also protecting the environment from any source of contamination during operations. NMFS expects that practicing these measures during buoy installation and maintenance will minimize any potential impacts to spinner dolphins using these areas.

4.2.4.2 Behavioral Responses

Under Alternative 4, Hawaiian spinner dolphins are expected to experience an appreciable reduction in disturbance associated with swim-with and vessel activities as well as the intensity of activity in essential daytime habitats in comparison with the No Action Alternative, because this alternative combines the protective measures of an approach rule under Alternative 3, and decreases human use of five essential daytime habitats creating space for dolphins to engage in fitness-enhancing behaviors undisturbed throughout the day. Activity budgets of spinner dolphins using time-area closures would more closely resemble an undisturbed state during closure times and outside of closure areas spinner dolphins will receive protections associated with approach regulations. Overall reductions in disturbance would appreciably benefit spinner dolphins behavioral and energetic budgets because time and energy spent reacting to disturbance may be redirected to fitness-enhancing activities. As a result, NMFS anticipates that this alternative will support and/or improve spinner dolphin health and fitness. Improvements to the fitness of individuals could lead to improved status of local populations.

4.2.4.3 Habitat Use

Implementation of Alternative 4 will provide the habitat protections associated with Alternative 3 and include protections associated with time-area closures. Time-area closures implemented under Alternative 4 would apply only to five bays: Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay (Hoʻokena), Makako Bay, and La Perouse Bay. Hawaiian spinner dolphins using these five areas would receive enhanced protections from human disturbance during historic resting hours. As discussed under the No Action Alternative (section 4.2.1.2), dolphins using essential daytime habitats targeted by people seeking interactions are likely to experience the highest amount of disturbance. Although Alternative 4 would not reduce the overall number of resource users attempting to view spinner dolphins throughout the MHI, reductions in behavioral disturbance within these five essential daytime habitats would reduce the likelihood that spinner dolphins would flee these areas of optimal resources, compared to the No Action Alternative. As

discussed earlier, researchers reported some spinner dolphins may have already met their threshold of disturbance within essential daytime habitats, and have observed changes to group size and habitat use for spinner dolphins using Kealakekua Bay (Forest 2001 and Östman-Lind *et al*. 2004). In Samadai Reef, Egypt, spinner dolphins returned to abandoned resting habitat when authorities removed and controlled the pressures of human disturbance through management measures (Nature Conservation Sector 2006, Notarbartolo di Sciara *et al*. 2009). Reductions in the levels of disturbance and appreciable improvements to the quality of habitat in the time-area closures may similarly encourage spinner dolphins to return to the time-area closures, potentially improving both the fitness of these individuals and the local populations.

Implementing time-area closures at only these five locations could displace some Hawaiian spinner dolphin-directed activities to new locations; however, the protections associated with approach regulations discussed under Alternative 3, and provided under this Alternative, would provide protections from disturbance for spinner dolphins using these other habitats. NMFS anticipates the reduction in disturbance associated with this alternative would improve the quality of the resting habitat in comparison with the No Action Alternative, because disturbance related to close approach by swimmers and vessels is expected to decrease and disturbance within time-area closures is expected to cease during historic resting hours. The increase in the quality of essential daytime habitats is expected to provide spinner dolphins with opportunities to optimize the use of resources within their resting habitats.

4.2.4.4 Overall Effects on Individuals and Effects on the Population

As described above, the implementation of measures under Alternative 4 is likely to reduce the amount of Hawaiian spinner dolphin behavioral responses associated with human disturbance. Additionally, Alternative 4 would provide a daytime shelter within five essential daytime habitats targeted by people wanting to interact with spinner dolphins, where disturbance is known to regularly occur. Under Alternative 4, the reduction in behavioral disturbance to spinner dolphins and the creation of time-area closures will provide spinner dolphins with more opportunities and space to engage in fitness-enhancing behaviors, which are likely to increase the fitness of individual spinner dolphins and the population as a whole. Enhanced protection associated with this alternative is expected to prevent long-term impacts to the resident stocks.

4.2.5 Alternative 5 –Voluntary Time-Area Closures in Specified Spinner Dolphin Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 5 would combine the protections associated with swim-with and approach regulations discussed under Alternative 3 (section 4.2.3) and include additional protections associated with people voluntarily not using five Hawaiian spinner dolphin essential daytime habitats in the MHI during prescribed periods (described in section 2.7). When a voluntary closure is effective, persons and vessels have a moral but not legal responsibility to comply with its terms. A violation does not result in sanctions. Voluntary closure sites under this alternative include the same five essential daytime habitats discussed above for Alternative 4: Kealakekua Bay, Hōnaunau Bay, Kauhakō Bay (Hoʻokena), and Makako Bay, Hawaiʻi; and La Perouse Bay, Maui (see section 2.7 for selection discussion). These proposed sites selected for closure represent areas where information from the scientific literature, NOAA OLE, State of Hawaiʻi

and scoping indicates that human interactions at these locations are disturbing spinner dolphins on a regular and ongoing basis (see section 2.7 for selection process or Appendix A). It is likely that spinner dolphins using these particular areas are subjected to the highest amount of disturbance, putting these dolphins at the highest risk for long-term physiological impacts from chronic disturbance to behavioral patterns and/or loss of optimal habitat.

Alternative 5 would provide a set of protections to address ongoing activities that cause disturbance in close proximity to spinner dolphins (described by Alternative 3). Additionally, Alternative 5 may offer some protections in five essential daytime habitats if communities are able to establish support for the closures locally and persuade visitors to comply. May (2005) indicates that compliance is higher for enforced regulations, in comparison to voluntary measures, but that compliance with management measures may be strengthened by social motivations (from peer and other social pressures). Community support for voluntary closures in some of these Bays may motivate more people to comply with voluntary closures. However, each area identified for closures has a wide variety of resource users (see section 3.4) and conflicts in beliefs, motivations, and resource needs among these resource users may make it particularly difficult for some areas to reach a common understanding with regard to protecting Hawaiian spinner dolphins' essential daytime habitats. Heenehan *et al*. (2014) used Ostrom's attributes to evaluate management methods that may be favorable for Makako and Kealekekua Bay, the evaluation indicated limited potential for community-based conservation and favored a more ecosystem-based approach where managers (*e.g.*, the federal government) would use stakeholder input to determine appropriate mandates for the management of the areas. Based on the lack of success observed with other voluntary measures to protect Hawaiian spinner dolphins (*e.g*., wildlife viewing guidelines, NMFS guidelines, and the CORAL West Hawai'i Voluntary Standards), NMFS anticipates that voluntary closures will have limited success in reducing the overall intensity of dolphin-directed activities in most areas due to low compliance and that this Alternative will offer protections for Hawaiian spinner dolphins largely similar to Alternative 3 (see section 4.2.3).

Exceptions exist for approach prohibitions some of which also apply to the time-area closures as well (see section 2.1.1.2 and Table 4). Section 4.2.3 contains a discussion of the impacts of these exceptions. In addition to the exceptions discussed above regarding approach regulations, additional activities have been described as exceptions from voluntary time-area closures. These are the same as the regulatory exceptions described for the mandatory time-area closures and include (1) vessels participating in organized community-based outrigger canoe races that transit straight through a time-area closure, (2) vessels that transit the time-area closure for the sole purpose of ingress and egress to privately owned shoreline residential property located immediately adjacent to the time-area closure, and (3) outrigger canoes used for traditional subsistence fishing with harvested resources intended for personal, family, or community consumption or traditional use. Each of these activities occurs on an infrequent basis, is not dolphin-directed, and is unlikely to individually or cumulatively casue disruptive impacts to spinners or have long-term effects or result in habitat abandonment. In the discussion of the relevant bays (section 3.4.5) NMFS identifies each exception type of activity that may occur. However, due to the infrequency of the activity and because the exception only allows for transit, NMFS expects that impacts to spinner dolphins from these activities are likely to be low.

The installation and maintenance of buoys at the five closures sites may affect Hawaiian spinner dolphins, as discussed above in section 4.2.4.1. The number and placement of buoys installed under Alternatives 4 and 5 are the same for each bay (a total of 16 buoys would be installed to implement closures under these alternatives); therefore, the impacts associated with buoy installation and maintenance are considered the same for these two alternatives.

4.2.5.1 Behavioral Responses

As noted in section 4.2.2 close approach by swimmers disrupts spinner dolphin natural behaviors at an energetic cost to these animals. Similarly, vessels approaching spinner dolphins have been shown to elicit disturbance responses, which interrupt natural fitness-enhancing behaviors (Forest 2001, Ross 2001). This alternative would reduce the amount of disturbance experienced by Hawaiian spinner dolphins, compared to the No Action Alternative. With close swimmer and vessel activities prohibited, NMFS expects this alternative to greatly reduce the amount of disturbance to spinner dolphins and reduce the amount of time and energy that spinner dolphins expend on those reactions. Under Alternative 5, spinner dolphins will be able to focus more time and energy towards fitness-enhancing activities, which supports the health of individuals and resident populations providing appreciable benefits to the spinner dolphins. If people and vessels participate in voluntary time-area closures, spinner dolphins may also receive the benefits associated with providing a refuge for these animals; these benefits are discussed above in section 4.2.4.2.

4.2.5.2 Habitat Use

NMFS anticipates the reduction in disturbance associated with Alternative 5 will slightly improve the quality of the resting habitat in comparison with the No Action Alternative, similar to Alternative 3, because disturbance events related to close approach by either swimmers or vessels are expected to decrease. If communities are able to establish support for the closures locally and persuade visitors to comply with the closed periods Hawaiian spinner dolphins would experience benefits similar to those described under Alternative 4 in section 4.2.4.3. However, NMFS anticipates that participation in voluntary time-area closures will be limited and that these daytime habitats will likely remain targets for spinner dolphin-directed viewing activities. Thus, habitat-related impacts may still occur to some degree under this alternative.

4.2.5.3 Overall Effects on Individuals and Effects on the Population

As described above, the implementation of measures under Alternative 5 is likely to reduce the amount of Hawaiian spinner dolphin behavioral responses associated with human disturbance due to prohibitions associated with an established approach prohibition. While NMFS expects approach regulations to alleviate a large portion of the disturbance that threatens the long-term health of resident populations, NMFS expects that participation with voluntary time-area closures will be low and that these management measures will be unable to provide much benefit to spinner dolphins without complete community support. As discussed under Alternative 3, it is uncertain to what degree the elimination of close approach activities will alleviate the intense dolphin-directed activity and other recreational activities in essential daytime habitats or disturbance by activities that do not include closely approaching these animals. While, approach

regulations may be sufficient to prevent long-term impacts to Hawaiian spinner dolphins some individuals may remain at risk due to the intense activity in essential daytime habitats not being adequately addressed.

4.2.6 Summary of Impacts to Hawaiian Spinner Dolphins

Table 12 (below) describes Impacts to Hawaiian Spinner Dolphins under the No Action alternative. Table 13 (below) provides symbols to summarize expected changes to disturbance levels and the anticipated responses in spinner dolphins' behaviors, habitat and overall population level impacts associated with the implementation of the various alternatives. Table 14 below) uses the established symbols to describe the anticipated impacts of each alternative in comparison to the No Action alternative.

Table 7: Summary of No Action Impacts to Hawaiian Spinner Dolphins

Alternative	Disturbance Threats	Disturbance	Impacts to Hawaiian Spinner Dolphins		
			Behaviors	Habitat Use	Population Level Impacts
1. No Action	**Swim-with**	Spinner dolphins experience disturbance and disruptions to behaviors from close approach activities, including swim-with and vessels. In addition, spinner dolphin groups are under intense pressure from dolphin-directed activities in targeted essential daytime habitats.	Spinner dolphins exhibit individual disturbance behaviors and changes to group behavior patterns from described threats. Changes to natural behaviors may result in a cost to the energetic and behavioral budget of these animals.	Spinner dolphins exhibit changes in essential daytime habitat use including: habitat avoidance during high human use, decreased residence times, changes to distribution within the area, and changes to the number of dolphins using these areas.	Energetic models predict that increases in disturbance threats could leave individuals at an energetic deficit and warn that lactating mothers and juveniles may already be at risk. Other cetaceans facing similar pressures from wildlife viewing industry activities demonstrate long-term impacts such as habitat abandonment and reduced reproductive success.
	Vessels				
	Intensity in targeted essential daytime habitats				

Table 8: Symbols for Hawaiian Spinner Dolphins Impacts

Impact Level Symbols	Disturbance Levels	Impacts to Hawaiian Spinner Dolphins		
		Behaviors	**Habitat Use**	**Anticipated Population Level Impacts**
++	Appreciable reductions in disturbance are expected because prohibitions directly address the disturbance threat(s)	Appreciable benefits to behavioral and energetic budgets are expected because time and energy spent reacting to disturbance may be redirected to fitness-enhancing behaviors	The quality of essential daytime habitats are appreciably improved and optimal use of habitat resources are expected	Enhanced protections are expected to prevent long-term impacts
+	Small reductions in disturbance are expected because indirect benefits may accumulate from other prohibitions	Small benefits to behavioral and energetic budgets are expected because some time spent on disturbance may be redirected to fitness-enhancing behaviors	The quality of essential daytime habitats may improve slightly	Enhanced protections may be sufficient to prevent long-term impacts
0	No appreciable change is expected	No appreciable change is expected	No appreciable change is expected	Long-term impacts to resident populations are anticipated and may include habitat displacement and reduce fitness that may lead to population declines
-	Small increases in disturbance are expected from activities or in areas that have less specific prohibitions	Small increased costs are expected to behavioral and energetic budgets	Further reductions in the quality of habitat is expected	Long-term impacts to resident populations are anticipated and may include habitat displacement and reduce fitness that may lead to population declines

Table 9: Summary of Impacts to Hawaiian Spinner Dolphins

Alternatives		Types of Interactions	Disturbance Levels	Impacts to Hawaiian Spinner Dolphins		
				Behaviors	Habitat Use	Anticipated Population Level Impacts
1.	No Action	Swim-with	0	0	0	0
		Vessel/watercraft	0	0	0	0
		Intensity of activities	0	0	0	0
Relative to the No Action Alternative						
2.	Swim-With Regulation	Swim-with	++	+	0	0
		Vessel/watercraft	0			
		Intensity of activities	0			
3(A).	Swim-With and 50 Yard Approach	Swim-with	++	++	+	+
		Vessel/watercraft	++			
		Intensity of activities	+			
3(B).	Swim-With and 100 Yard Approach	Swim-with	++*	++*	+	+
		Vessel/watercraft	++*			
		Intensity of activities	+			
4.	Mandatory Time-Area Closures and Swim-With and Approach Regulations	Swim-with	++	++	++	++
		Vessel/watercraft	++			
		Intensity of activities for five closures	++			
		Intensity of activities outside closures	+			
5	Voluntary Time-Area Closures and Swim-With and Approach Regulations	Swim-with	++	++	+*	+
		Vessel/watercraft	++			
		Intensity of activities for five closures	+*			
		Intensity of activities outside closures	+			

***Further distances or voluntary closures may amplify benefits, however increases are not expected to be sufficient to reach the next higher criteria.**

4.3 Impacts to Other Protected Marine Species and Habitats

"Other Protected Marine Species and Habitats" refers to those species other than spinner dolphins (see Table 6, section 3.2), and habitats that are protected under the MMPA, ESA, and MSA, and whose range may overlap with the proposed action area as discussed in Chapter 3.

4.3.1 Impacts to Protected Marine Species and Habitats under the Various Alternatives

Under the No Action Alternative, protected species using habitat overlapping with Hawaiian spinner dolphins range may experience some disturbance from swimmer and vessel interactions; however, the way in which people interact with these species and the regularity is different from Hawaiian spinner dolphins based on differences in the species' behavioral ecologies. MHI resident stocks of Hawaiian spinner dolphins are unique because their behavioral ecology involves groups of these animals regularly using areas that are easily accessed by people from shore. Many of the species listed in Table 5 are seen in nearshore waters, however several of the cetaceans are seen further from shore and with less predictability; these species include false killer whales, pygmy killer whales, short-finned pilot whales, and pantropical spotted dolphins. Commercial tours and individuals opportunistically engage in activities that cause disturbance to these gregarious species, such as closely approaching the animals. However, the frequency of disturbance to these species from these activities is low due to the less regular nature of these encounters.

Protected species that are likely to be found within essential daytime habitats used by spinner dolphins include the Hawaiian monk seal, green turtle, bottlenose dolphin, humpback whale and potentially the hawksbill turtle and giant manta ray (see section 3.2). These species' behavioral ecologies are more solitary in nature and species may be seen but with less predictably and/or in fewer numbers in comparison to resident spinner dolphins.

Under the No Action Alternative, protected species using spinner dolphin essential daytime habitats may be disturbed or stressed by the intensity of activity drawn to these areas for dolphin-directed reasons. Similar to spinner dolphins, protected species in these areas could be displaced from preferred habitats (to avoid the increased disturbance or human use in the areas) and protected species remaining within these habitats may be disturbed by individuals who divert their attention away from the dolphin-directed activity to view or interact with these other protected species. For example, people sometimes swim with humpback whales within or just outside of Kealakekua Bay (Tyne *et al*. 2014). Disturbance to any of the protected species noted in Table 6 (section 3.2) may interrupt a number of behaviors, such as resting, socializing, nursing, or foraging, which support the fitness and conservation of these protected species. Based on the available information it is difficult to determine if spinner dolphin-related disturbance is having detrimental or population level impacts on protected species in Hawai'i's waters.

Under Alternatives 3(A) and 3(B), protected species that use spinner dolphin essential daytime habitats may experience increased viewing pressure if participants in spinner dolphin directed activities were to seek opportunites for close encounters with other marine mammals. Currently there are commercial tour operators that provide opportunities for generalized wildlife viewing. The extent to which demand for this type of activity is unknown, but would likely vary by species and access to those species. Currently commercial tours generally target spinner dolphins

and humpback whales, while other species encounters are more opportunistic. Species, such as IFKWs, that are less predicatble for targeted encounters, typically occur in deep waters, and have a low population size or are more widely dispersed, are unlikely to experience increased viewing pressure under Alternatives 3(A) or 3(B).

Under Alternatives 4 and potentially 5, sea turtles, giant manta ray, humpback whales, bottlenose dolphins and Hawaiian monk seals that use the five time-area closures may experience protection from disturbance during the closed times. However, the installation and maintenance of buoys at these five sites may affect these species, as discussed below in section 4.3.2. The number and placement of buoys installed under Alternatives 4 and 5 are the same for each bay (a total of 16 buoys would be installed to implement closures under these alternatives); therefore, the risk associated with buoy installation and maintenance is considered the same for these two alternatives. The number of buoys varies from bay to bay and this could mean slight differences for risk to certain protected species between the various bays. For instance, bays with higher numbers of buoys may slightly increase the risk of entanglement. The locations of buoys are discussed in section 2.7.1 for each proposed time-area closure area, but the exact locations will be determined during installation to avoid impacts to corals.

Outside of the habitat-associated impacts in the daytime areas targeted by people wanting to interact with Hawaiian spinner dolphins, there is the potential for commonly sighted near-shore cetaceans to be affected by the implementation of measures to enhance protections for the dolphins, including both swim-with and approach regulations (Alternatives 2-5), because tour vessels may redirect their attention to a cetacean species that is considered less regulated. As noted in Chapter 3, people do closely approach and swim with other cetacean species, notably humpback whales, and the frequency of these interactions are assumed less than with spinner dolphins, which are easily accessible due to their daily routines in near-shore waters. MMPA take prohibitions apply to all marine mammal species, and vessel operators must comply with those prohibitions. Because people are motivated to engage in close marine mammal encounters for various reasons, it is difficult to determine to what degree this behavior may increase with the various protective measures in place.

The features that support the various federally managed fish species vary widely over a large amount of habitat. Within Hawai‘i’s waters where spinner dolphin disturbance is most prevalent, near-shore EFH may be impacted by increased human use of the area. For example, Rodgers and Cox (2002) found that coral survivorship decreased along an increasing gradient of human use. Accordingly, coral habitats surrounding the sandy-bottom resting areas preferred by spinner dolphins may experience higher visitation rates due to the dolphin-directed activities in the area and increased damage may result to the surrounding reefs. As mobile components of the coral and sandy- bottom habitats, fish may be deterred from using the areas due to the high human activity (this has been identified as an impact by local community members in some areas). Thus, under the No Action Alternative, some protected species and habitats may continue to be affected by the increasing human use of essential daytime habitats and alternatives offering time-area closures (4 and 5) may offer some relief from habitat degradation.

4.3.2 Impacts to Protected Marine Species and Habitats from Buoy Installation and Maintenance under Alternatives 4 and 5

The buoy systems may affect organisms that use the marine environment as well as Hawaiian monk seal foraging areas that are an essential feature of the monk seal's critical habitat designation. However, the anchoring system will be placed in sandy substrate and NMFS does not expect that EFH, coral reefs and marine species living in the coral reefs will be directly affected. Hawaiian monk seal prey species could be hidden in sandy habitat in these areas and could flee the areas where buoys are installed. However, impacts are expected to be temporary in nature and prey species are likely to inhabit areas surrounding the buoys shortly after the initial disturbance. Impacts to the bottom will be focused at the point of anchoring for the buoys and the overall area affected will be very small compared to the surrounding habitat.

Other species of concern that may use this habitat include endangered and threatened species protected under the ESA, such as green and hawksbill sea turtles, giant manta rays, Hawaiian monk seals, and MHI insular false killer whales, as well as other commonly sighted marine mammals protected under the MMPA (see section 3.2.2). The precautions taken for these protected species will also apply to all other marine species that inhabit this environment, including Hawaiian spinner dolphins that rest in these areas, as discussed earlier.

Entanglement with loose buoy mooring lines is the primary risk to protected marine species throughout the lifetime of buoy systems. To prevent this risk, the minimum amount of line necessary to account for fluctuations in water depth due to tides and waves will be used for securing the buoys. NMFS will employ this precaution to ensure that lines are vertical and as taut as possible, to avoid the formation of loops and to prevent entanglement, while not compromising the efficacy of the anchoring system. In addition, NMFS will implement a maintenance schedule to inspect the lines and buoy system and ensure that parts are maintained and replaced as necessary, maintaining the integrity of the system and minimizing the risk to marine wildlife.

Installation of the buoy system may create temporary noise pollution in the area, which NMFS expects to be minimal since installation time will likely be short in duration. Additional concerns to protected species during the installation and maintenance processes may include disturbances from human activity and equipment operation; collision with vessels while deploying equipment or during maintenance procedures; exposure to vessel wastes and discharge; and the potential for impact by sinking anchor blocks during deployment (if the traditional anchor/block system is selected).

While surfacing to breathe, rest, or bask at the surface, sea turtles or marine mammals may be at risk of being struck by deployment or maintenance vessels or their propellers. A boat strike could cause potentially serious injuries to the animal, depending on the size, speed, and part of the vessel that strikes the animal, as well as what part of the animal's body is struck. Sustained injuries from boat strikes may include bruising, broken bones or carapaces, and lacerations. The separate recovery plans for green sea turtles and humpback whales identify vessel collisions as a threat to the two species (NMFS and USFWS 1998a, NMFS 1991). Monk seals seem to be at much lower risk of collision due to their agility and situational awareness (NMFS 2007). Sea turtle research indicates that turtles rely mostly on visual cues to avoid threats, and vessel avoidance has been found to be most consistent with vessels moving at slower speeds (less than 2 knots) (Hazel *et al*. 2007). Additionally, Vanderlaan and Taggart (2007) report evidence that as

vessel speed falls below 15 knots, there is substantial decrease in the probability that a vessel strike to a large whale will prove lethal. While vessel speed appears to indicate a decrease in severity of injury, collisions with large whales have been documented for both slow and fast moving vessels. This indicates that vessel operators must actively watch for and avoid both sea turtles and marine mammals while operating in project areas. During installation and maintenance of the buoys, personnel will adjust vessel speed in accordance with environmental conditions and animal proximity to maximize animal detection and avoidance.
Similar to Hawaiian spinner dolphin response, disturbance from human activity and equipment operation may startle sea turtles or marine mammals while the buoys are installed or maintained. Typically, sea turtles and marine mammals will avoid human activity; installation or buoy maintenance may cause protected species to avoid the source of the noise or activity during installation. Since these activities will be temporary and relatively short-lived, NMFS does not anticipate any chronic long-term impacts from the disturbances.

Vessel waste, such as trash or discarded materials, could create entanglement risks for protected species. Additionally, vessel discharge, including fuel and other toxicants, could expose protected species, monk seal critical habitat, and EFH to toxic chemicals. These types of intentional discard and discharge are prohibited in the marine environment and care is necessary to prevent accidental release of such materials and to appropriately respond to the release of any waste or discharge.

If anchor blocks are selected for the buoy system, protected species may be at risk of strike as the blocks are deployed, potentially cause injury. Although animals will likely avoid human activity associated with deployment activities, having deployment crews watch for sea turtles and marine mammals both at and below the surface of the water during deployment may further minimize the risk to marine animals. Buoys would be installed and maintained according to US Coast Guard standards.

To reduce the potential for adverse effects on protected marine species while the buoys are being installed or maintained, NMFS will employ the *NMFS Protected Resources Division Best Management Practices for General In-Water Work Including Boat and Diver Operations*. Management practices, which include avoiding protected species and reducing vessel speed, are available in Appendix C. They are intended to promote watchfulness to prevent disturbance and unintentional harm to protected species, while also protecting the environment from any source of contamination during operations.

4.3.3 Summary of Impacts to Protected Marine Species and Habitats

Table 15 and Table 16 (below) describe impacts under the No Action Alternative as impacts pertain to protected species using spinner dolphin essential daytime habitats and protected species found further from shore within spinner dolphins' daytime range respectively. Table 17 and Table 18 (below) provide symbols to summarize expected changes to disturbance levels and the anticipated responses in protected species' behaviors, habitat and overall population level impacts associated with the implementation of the various alternatives to enhance protections for Hawaiian spinner dolphins. Table 19 (below) uses the established symbols to describe the anticipated impacts of each alternative in comparison to the No Action alternative.

Table 10: No Action Impacts to protected species using spinner dolphin essential daytime habitats

Alternative	Disturbance Levels	Protected Species using spinner dolphin essential daytime habitats (turtles, giant manta rays, monk seals, humpback whales, bottlenose dolphins)		
		Behaviors	Habitat Use	Anticipated Population Level Impacts
1. No Action	Protected species using targeted spinner dolphin essential daytime habitats are likely to experience some disturbance from dolphin-directed activities in these areas.	Marine mammals, giant manta rays, and turtles may exhibit individual disturbance behaviors and changes to individual behavior from described threats. Changes to natural behaviors result in a cost to the energetic and behavioral budget of these animals.	Protected species using spinner dolphin essential daytime habitats may be disturbed or stressed by the intensity of dolphin-directed activity in targeted essential daytime habitats and may be displaced.	There is no information to indicate that dolphin-directed activities that cause disturbance are having or are likely to have detrimental or population level impacts to other protected species.

Table 11: No Action Impacts to protected species found further from shore within spinner dolphins' daytime range

Alternative	Disturbance Levels	Protected Species found further from shore within spinner dolphins' daytime range (false killer whales, pygmy killer whales, short-finned pilot whales, and pantropical spotted dolphins)		
		Behaviors	Habitat Use	Anticipated Population Level Impacts
1. No Action	Commercial tours and individuals opportunistically engage in activities that cause disturbance to the above species, such as swimming-with or closely approaching the animals. However, the frequency of disturbance to these species is believed to be low due to the ecology of the species and the lower demand for these types of interactions.	Individual marine mammals or groups may exhibit disturbance behaviors from described threats. Changes to natural behaviors result in a cost to the energetic and behavioral budget of these animals.	There is no information to indicate that disturbance levels are impacting habitat use for the above species.	There is no information to indicate that dolphin-directed activities that cause disturbance are having or are likely to have detrimental or population level impacts to other protected species.

Table 12: Symbols for Protected Species Impacts in Spinner Dolphin Essential Daytime Habitat

Impact Level Symbols	Protected Species using spinner dolphin essential daytime habitats (turtles, giant manta rays, monk seals, humpback whales, bottlenose dolphins)			
	Disturbance Levels	**Behaviors**	**Habitat Use**	**Anticipated Population Level Impacts**
+	Small reductions in disturbance are expected because indirect benefits may accumulate from spinner dolphin time-area closures	Small benefits to behavioral and energetic budgets are expected because some time spent on disturbance may be redirected to fitness-enhancing behaviors	The quality of essential daytime habitats may improve slightly	Protections may be sufficient to prevent long-term impacts
0	No appreciable change is expected	No appreciable change is expected	No appreciable change is expected	No appreciable change is expected
–	Small increases in disturbance are expected for species using habitats with displaced dolphin-directed activities	Small increased costs are expected to behavioral and energetic budgets	Further reductions in the quality of habitat is expected	It is difficult to determine to what degree changes will result in population level impacts

Table 13: Symbols for Protected Species Impacts found further from shore within spinner dolphins' daytime range

Impact Level Symbols	Protected Species found further from shore within spinner dolphins' daytime range (false killer whales, pygmy killer whales, short-finned pilot whales, and pantropical spotted dolphins)			
	Disturbance Levels	**Behaviors**	**Habitat Use**	**Population Level Impacts**
+	Small reductions in disturbance are expected because indirect benefits may accumulate from spinner dolphin prohibitions	Small benefits to behavioral and energetic budgets are expected because some time spent on disturbance response may be redirected to fitness-enhancing behaviors	The quality of essential daytime habitats may improve slightly	Protections may be sufficient to prevent long-term impacts
0	No appreciable change is expected	No appreciable change is expected	No appreciable change is expected	No appreciable change is expected
–	Small increases in disturbance are expected for species with less specific prohibitions	Small increased costs are expected to behavioral and energetic budgets	Habitats that are more accessible for wildlife-viewing may reduce in quality	It is difficult to determine to what degree changes will result in population level impacts

Table 14: Impacts to Protected Species

Alternatives		Protected Species using spinner dolphin essential daytime habitats (turtles, giant manta rays, monk seals, humpback whales, bottlenose dolphins)				Protected Species found further from shore within spinner dolphins' daytime range (false killer whales, pygmy killer whales, short-finned pilot whales, and pantropical spotted dolphins)			
		Disturbance Levels	Behaviors	Habitat Use	Population Level Impacts	Disturbance Levels	Behaviors	Habitat Use	Population Level Impacts
1.	No Action	0	0	0	0	0	0	0	0
Relative to the No Action Alternative									
2.	Swim-With Regulation	0	0	0	0	-	-	0	0
3(A).	Swim-With and 50 Yard Approach	0	0	0	0	-	-	0	0
3(B).	Swim-With and 100 Yard Approach	0	0	0	0	-	-	0	0
4.	Mandatory Closures and Swim-With and Approach Regulations	+/0/-	+/0/-	+/0/-	0	0/-	0/-	0	0
5.	Voluntary Closures and Swim-With and Approach Regulations	+/0/-	+/0/-	+/0/-	0	0/-	0/-	0	0

4.4 Socioeconomic Impacts and Impacts on Cultural Resources

4.4.1 Alternative 1 – No Action

Under the No Action Alternative, NMFS would implement no new or additional regulations to enhance protections for Hawaiian spinner dolphins. Under this alternative, all activities (both spinner dolphin-directed and not) discussed under section 3.4 are anticipated to continue unabated.

As discussed under Hawaiian spinner dolphin impacts (section 4.2.1), unrestricted spinner dolphin-directed activities may result in displacement of the dolphins from essential daytime habitats or complete habitat abandonment, as seen in Samadai Reef (Nature Conservation Sector 2006, Notarbartolo-di-Sciara *et al*. 2009). Gradual declines in spinner dolphin numbers or habitat abandonment could affect the ability of dolphin-directed and wildlife related activities to locate the dolphins. For example, those people who are engaged in spinner dolphin-directed activities may need to travel farther or engage in these activities in areas where travel conditions are less optimal for recreational passengers, such as from choppy water. For tour operators, this could result in increased travel time, higher fuel costs and reduced satisfaction of customers, which may ultimately compromise their ability to operate at current profit margin (NMFS discusses this further in the Regulatory Impact Review (RIR) in Chapter 5). Impacts to industry are described further in Chapter 5, but are expected to be felt most strongly by those activities that actively seek out dolphins rather than those that incidentally view or interact with them.

Under current conditions, some local communities have expressed the opinion that unrestricted Hawaiian spinner dolphin-directed activities are negatively impacting their local community and natural resources (NMFS 2007, Honua Consulting 2013). The influx of people and vessels in these small, essential daytime habitats targeted by people wanting to interact with the dolphins puts a strain on local communities, including public facilities, services and/or parking areas. Many local bays served as a gathering place for the subsistence harvests of local communities and, as a result, these areas supported social and cultural activities that bring these communities together. During scoping, some community members indicated that spinner dolphin-directed activities could amplify competition between visitors and local residents for access to marine resources, creating conflict between these two groups (NMFS 2007). Community members at certain bays identified that the increased visitation to the bays drives some community members away (Hoʻokena community meeting, August 1, 2012). In addition, community members in various areas expressed concerns that the intense activity in the essential daytime habitats targeted by people wanting to interact with the dolphins are negatively affecting fisheries, and that visitors who are not mindful of the environment may be degrading other marine and coastal resources (NMFS Scoping Report: http://www.fpir.noaa.gov/PRD/prd_spinner_EIS.html). As spinner dolphin-directed activities are expected to continue or increase under the No Action Alternative, the above impacts are likely to continue and the strain on local communities and natural resources may increase.

4.4.2 Alternative 2 – Swim-With Regulation

Under Alternative 2, Hawaiian spinner dolphin-directed swimming activities would be prohibited, but NMFS does not expect this alternative to impact other activities that are unrelated to swimming with spinner dolphins, such as boaters and other watercraft, other recreational users, fishing, Native Hawaiian practices, and gathering and subsistence harvest. NMFS anticipates that this alternative will affect dolphin-directed and wildlife related activities including tour operations and those who engage in spinner dolphin-directed swimming from shore or watercraft. It is difficult to measure to what degree the implementation of this alternative will affect tour operations, compared with the No Action Alternative, as tour operations may have varying degrees of dependence on swim-with activities and may choose to engage in an alternative type of tour if prohibitions are applied to swim-with activities. Generally, prohibitions against swimming with spinner dolphins is expected to appreciably reduce sales for tour operators that engage in these activities if an alternative activity is not offered by these tours. Various supporting business entities, such as swim guides, caterers, accommodation purveyors, and vessel maintenance and repair businesses could also be affected; however, given the attenuated link between the prohibition and these entities, NMFS cannot determine the potential impact with any certainty. Dolphin-watch, generalized tours and kayak tours are expected to be largely unaffected by this regulation, but may experience positive or negative indirect impacts associated with changes to the swim-with tours (more or less operators) or people seeking other platforms to experience spinner dolphins (discussed below). NMFS describes the economic impacts of this alternative on commercial entities further in the RIR found in Chapter 5.

Shore-based swimmers are motivated to swim with Hawaiian spinner dolphins for multiple reasons — recreation, curiosity, and spiritual beliefs, among others — and NMFS anticipates that impacts to this group from Alternative 2 will vary. Some individuals may be largely unaffected by this alternative and choose a different form of recreation once aware of the prohibitions. Other individuals who seek a spiritual or healing experience from closely interacting with the dolphins will be limited in their ability to experience the dolphins up close, but will continue to be able to view the dolphins from greater than 50 yards. Under Alternative 2, individuals may choose to view the dolphins from a different platform, such as a vessel or kayak, for an up-close experience and/or from a greater distance.

Alternative 2 may decrease the impacts of shore-based swimmers on some local communities currently affected by Hawaiian spinner dolphin-directed activities (see Alternative 1), because swimmers may no longer access those areas from shore to interact with the dolphins. Still, some shore-based swimmers may choose to do so from a different platform in the same areas and more vessels could use these areas than in the past. The degree to which these impacts on local communities are affected will vary based on the prevailing spinner dolphin-directed activities in the bay and the accessibility of that area for other watercrafts. For example, bays where shore swimming is common may experience more relief from this alternative; however, use of other platforms, particularly kayaks and SUPs, may increase in frequency, which may negate any relief provided by this alternative. Recreational swimmers (not dolphin-directed) may need to have increased vigilance in areas with spinner dolphins as a result of this regulation.

4.4.3 Alternative 3 – Swim-With and Approach Regulations

4.4.3.1 Alternative 3(A) – Swim-With and 50 Yard Approach Regulations

Alternative 3(A), the swim-with and 50 yard approach regulations, is expected to affect a wide variety of activities in Hawai‘i’s waters because it prohibits people and vessels from closely approaching Hawaiian spinner dolphins. NMFS anticipates that this alternative will affect tour operators similarly to Alternative 2, because prohibitions on close approach includes swim-with activities. However, dolphin-watch tours and dolphin-directed kayak tours may experience decreases in ticket sales among individuals who are seeking an opportunity to approach spinner dolphins within 50 yards. Still, viewing opportunities may still be had from the 50 yard distance and these tours and businesses could experience indirect impacts associated with changes to swim-with tours and independent swimmers’ choices (see above). Various supporting business entities, such as swim guides, caterers, accommodation purveyors, and vessel maintenance and repair businesses may also be affected; however, however, given the attenuated link between the prohibition and these entities, NMFS cannot determine the potential impact with any certainty. NMFS describes the economic impacts of this alternative on commercial entities further in the RIR found in Chapter 5.

Shore-based swimmers may be affected similarly to Alternative 2 (section 4.4.2), as this alternative prevents these swimmers from close approach in the water. However, under Alternative 3(A), shore-based swimmers will not have the option to seek close-up viewing opportunities through other platforms (kayaks, SUPs) and will be limited to viewing Hawaiian spinner dolphins from a 50 yard minimum distance.

NMFS anticipates that this alternative will reduce the effects on local communities from spinner dolphin-directed activities more than Alternative 2; however, the degree to which they will be affected may vary and intense activity may still exist in small areas. Alternative 3(A) may also affect some human activities that are not spinner dolphin-directed because this alternative prohibits all types of vessels from approaching spinner dolphins within 50 yards. Therefore, swimmers and operators of a variety of vessels will need to be vigilant about the distance between themselves and/or their vessel (or watercraft) and spinner dolphins. In some cases, vessel operators may need to alter their course to avoid close proximity to the dolphins. The 50 yard approach rule may not be easily maintained in all circumstances because dolphin behaviors may put them in close proximity to swimmers or vessels. NMFS has created eight exceptions to this prohibition specifically to address situations where vessels are underway or transiting a harbor, or when vessels and swimmers are approached by dolphins (see section 2.4.1).

The capacity of tour businesses to adapt to the prospective regulatory change is likely to vary based in part on the nature of the tour in question. Business owners who offer in-ocean dolphin encounters as an eco-tourism activity and to persons attending spiritual retreats will unavoidably be impacted since a 50 yard buffer would preclude effective underwater viewing of the

cetaceans. Various supporting business entities, such as swim guides, caterers, accommodation purveyors, and vessel maintenance and repair businesses would also be affected; however, given the attenuated link between the prohibition and these entities, NMFS cannot determine the potential impact with any certainty.

Interviews with Dolphin-focused Boat Tour and Spiritual Retreat Operators

As part of the 2018 Economic Data Report (Impact Assessment, Inc. 2018), interviews were conducted with several operators of dolphin-focused boat tours on Hawai‘i Island, the Leeward Coast of O‘ahu, Maui, and Kaua‘i, and owners of spiritual retreats on Hawai‘i Island. The interview questions asked them to provide their perspecitves on how the Preferred Alternative might affect their businesses. Their responses are provided in Tables 20 and 21 below.

Table 20: Reported-as-Likely Effects of a 50 Yard Buffer, Tour Boat Owners and Operators: 2017 (n=69)*

Reported-as-Likely Effect	Island	Frequency
Would go out of business	Hawai‘i	6
Would have to find a different market niche	O‘ahu	2
	Maui	1
Would lead to some negative impact	Maui	1
Would incur “major debt”	Hawai‘i	1
Would pose a hindrance to navigation	Maui	1
	Kaua‘i	4
Would cause detrimental economic impacts	Maui	4
Would diminish overall profitability	Hawai‘i	3
Would generate a loss of marketability	Maui	4
	Kaua‘i	6
Would not allow for a satisfactory viewing experience	Maui	4
	Kaua‘i	5
Would devalue business, boat, and/or permit	Hawai‘i	3
	O‘ahu	1
Would lead to citations	Maui	2
	Kaua‘i	2
Would impact ability to undertake planned expansion	Hawai‘i	1
Would diminish number of clients potentially available to engage in evening manta ray tours	Hawai‘i	1
Would have to lay off employees	Hawai‘i	3
Would have little or no impact	Hawai‘i	1
	Maui	6
	Kaua‘i	4
Temporary loss of business but will recover	O‘ahu	1
Loss of business already noted	O‘ahu	3
Would generate positive impact	Maui	1
Would bring customers displaced from underwater experiences in Kona	Maui	1

*Data derived from open-ended discussion of likely impacts.

Table 21: Reported-as-Likely Effects of a 50 yard Buffer, Hawai'i Island Spiritual Retreat Operators: 2017 (n=14)*

Reported-as-Likely Effect	Frequency
Would go out of business	5
Would create a different kind of retreat	2
Would move retreat off-island	8

*Data derived from open-ended discussion of likely impacts.

Whether spinner dolphin operators can adapt to the new regulations by ending close or otherwise potentially disruptive interactions with wild spinner dolphins and still provide a meaningful and economically viable viewing experience to patrons remains to be seen. Discussions with business owners and operators provide insight into current perspectives on this matter, but these perspectives and related strategies can and will change. Predictions about how businesses that presently offer underwater dolphin encounters and interactions will react to the proposed spatial buffer are speculative in nature. Some owners and operators will adapt by offering a more remote viewing experience. Others will emphasize alternative sightseeing, recreational, or ecotourism options. Some will exit the industry. Currently, some tour operators in Hawaii follow Dolphin SMART safe viewing guidelines that use a 50 yard viewing distance from spinner dolphins and have remained profitable and competitive with swim-with-dolphin operators. It is also possible that some tour operators will experience some loss of revenues due to differences in the amounts charged for a swim-with-dolphin experience versus a general marine tour/wildlife viewing experience. A 50 yard approach regulation will ensure that tour operators comply with even-handed requirements that minimize the risk of harassment of these marine mammals.

4.4.3.2 Alternative 3(B) – Swim-With and 100 Yard Approach Regulations

Under Alternative 3(B), the swim-with and 100 yard approach regulations, is expected to have more of a negative effect on dolphin-watch and dolphin-directed kayak tours ticket sales than Alternative 3(A), because the greater distance of 100 yards is expected to decrease the public's ability to view and connect with wild spinner dolphins. Further, untrained viewers may have difficulty spotting animals engaged in natural behaviors without using visual aids such as binoculars. Accordingly, this greater distance may diminish both the experience of dolphin watching and opportunities to participate in dolphin watching which educates the public about dolphins and fosters stewardship. Additionally, not all activities within 100 yards of spinner dolphins are expected to result in take. NMFS describes the economic impacts of this alternative on commercial entities further in the RIR found in Chapter 5.

Although it could be argued that humpback whale-watching tours are restricted to a 100 yard distance, those animals are much larger and easier to spot from a distance than are dolphins. In contrast, spinner dolphins are small animals that do not normally display aerial behaviors throughout the day when they are undisturbed in their daytime resting period. At 100 yards spinner dolphins surfacing for air as their dorsal fins break the water's surface may be difficult to detect.

Shore-based swimmers may be affected similarly to Alternative 3(A), as this alternative prevents these swimmers from close approach in the water; however, they will be limited to viewing Hawaiian spinner dolphins from a 100 yard minimum distance.

NMFS anticipates that this alternative will reduce the effects on local communities from spinner dolphin-directed activities more than Alternative 2; however, the degree to which they will be affected may vary and intense activity may still exist in small areas. Alternative 3(B) may also affect some human activities that are not spinner dolphin-directed more than 3(A) because this alternative prohibits people and vessels from approaching spinner dolphins at a greater distance. Increasing the distance between spinner dolphins and people or vessels may diminish the threat of disturbance; however, this increased distance also has the potential to prohibit some human activities that are not likely to result in take of spinner dolphins and therefore could unnecessarily burden the public. Swimmers and operators of a variety of vessels will need to be even more vigilant about the distance between themselves and/or their vessel (or watercraft) and spinner dolphins. In some cases, vessel operators may need to alter their course to avoid close proximity to the dolphins. The 100 yard distance may be more difficult to judge and maintain for people that are inexperienced with dolphin behaviors. Additionally, in some small areas maintaining this distance with multiple vessels and people around may be particularly difficult. The exceptions described under Alternative 3(A), see section 2.7.3, would also apply to this alternative, when vessels or swimmers are within 100 yards of the dolphins.

4.4.4 Alternative 4 –Mandatory Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 4 combines the prohibitions associated with Alternative 3 with mandatory time-area closures within five bays that are targeted for spinner dolphin viewing activities.

Faced with the prohibitions under Alternative 4, shore-based swimmers may choose to participate in different recreational activities (similar to Alternative 2), or view the dolphins from the prescribed distance outside of the time-area closures within the designated bays (similar to Alternative 3). Additional impacts from human activity include the loss of access to the closed areas during the closed times by other ocean users, such as snorkelers, divers, kayakers, canoe paddlers, cultural practitioners, and subsistence and recreational fishers. To minimize impacts to human activities that are not Hawaiian spinner dolphin-directed and are not likely to result in take, NMFS carefully delineated closure areas to include the areas where spinner dolphins rest but, when possible, to exclude areas used for other activities. At all locations, activities occurring in the intertidal zone, such as shore-based fishing and subsistence gathering, are not prohibited and will be able to continue during any time of day. In addition, all ocean-related recreational, fishing, subsistence gathering, and/or cultural activities that are currently ongoing would still be able to continue in those parts of the bays that are not designated as closure zones.

Because Alternative 4 would restrict swimming with Hawaiian spinner dolphins, close approach by vessel, and viewing in the time-area closures, tour operators may experience economic impacts from loss of ticket sales, or increased costs associated with altering routes and/or times (see RIR for economic information). Still, similar to Alternatives 2 and 3, some tour operators may choose to offer alternative recreational opportunities as part of the tour to maintain or

minimize impacts from reductions in ticket sales. NMFS describes the economic impacts of this alternative on commercial entities in detail in the RIR found in section 5.

Impacts to shore-based swimmers are expected to be most similar to Alternative 3 because it is the most restrictive to this user group. The impacts (both positive and negative) to other ocean users include all impacts discussed above for Alternative 3. Additionally, this alternative introduces impacts that are specific to the five closure areas. The five areas are Makako Bay, Kealakekua Bay, Hōnaunau Bay, and Kauhakō Bay on Hawai‘i Island, and La Perouse Bay on Maui. Under this alternative, NMFS anticipates that the prohibitions for time-area closures from 6 AM until 3 PM will affect both Hawaiian spinner dolphin-directed activities and non-dolphin-directed activities. The magnitude of the impact will largely depend on where the activity takes place, whether alternative areas are available for the activity to continue or whether the activity may occur outside of the closure times.

Additional impacts to human activity include the loss of access to the closed areas during the closed times by other ocean users, such as snorkelers, divers, kayakers, canoe paddlers, cultural practitioners, and subsistence and recreational fishers; during some time periods these impacts may occur when spinner dolphins are not present in the bay. Thus, restrictions on entry could apply when there is reduced likelihood of take occurring. To minimize the likelihood of impacts to human activities that are not Hawaiian spinner dolphin-directed, NMFS carefully delineated closure areas to include the regions where spinner dolphins rest but, when possible, to exclude areas used for other activities. At all locations, activities occurring in the intertidal zone, such as shore-based fishing and subsistence gathering, are not prohibited and will be able to continue during any time of day. In addition, all ocean-related recreational, fishing, subsistence gathering, and/or cultural activities that are currently ongoing would still be able to continue in those parts of the bays that are not designated as closure zones.

Buoy installation may cumulatively affect cultural practices by detracting from the view plane at some of the proposed time-area closure sites, where it is already affected by the sight of both onshore and offshore development, such as housing, mooring buoys, and aquaculture facilities. Vessel anchoring during buoy installation also has the potential to directly affect historic underwater properties, and may cumulatively add to the impacts from storm events or tsunamis, and to the impacts from potential Hawaiian monk seal recovery actions. The use of buoys could also affect historic properties if present at time-area clsoures sites.

4.4.4.1 Hawai‘i Island

This regulation will affect commercial dolphin tour operators on the Island of Hawai‘i that regularly visit the four time-area closures to encounter Hawaiian spinner dolphins. The magnitude of these impacts may vary based on the tour operators’ response to the prohibitions. Some tour operators may choose to alter the route or locations that are visited to encounter spinner dolphins, some may alter the times associated with visiting certain areas and others may choose to continue to visit the bays where time-area closures are implemented and allow their guests outside of the designated closure zones. These alterations could result in additional fuel costs and/or decreased ticket sales; NMFS discusses the economic impacts further in the RIR (section 5).

Kealakekua Bay
Within Kealakekua Bay, the resting area for Hawaiian spinner dolphins is delineated primarily over the sandy area at the center of the bay. Outside of the delineation, activities such as recreational swimming, kayaking, and using SUPs can continue, and the closure does not prevent people from accessing the Captain Cook Monument.

Interviews with Native Hawaiian lineal and cultural descendants from Kealakekua Bay indicated that traditional activities continue to occur in the bay, including fishing; subsistence gathering of ocean resources by cultural practitioners, such as limu and paʻakai; hoe waʻa (canoe paddling); gathering of cultural resources of spiritual and cultural protocols; gathering of lāʻau lapaʻau (medicines); ancestral caretaking and worship; worship of akua and aliʻi; care of burial sites; and care of historical sites (Honua Consulting 2013).

The closure was delineated in such a way that it would not affect a majority of these activities. Fishing could still occur outside of the closure area at all times of day, while fishing within the closure area can also occur in the early morning and late afternoon hours outside of the closure period. The closures will not affect subsistence gathering of limu and paʻakai, as well as gathering of terrestrial plants used for lāʻau lapaʻau. Hoe waʻa may be limited to areas outside of the closure or to times when the area is not prohibited; however, exceptions may apply (see section 2.7.3).

Cultural practices, such as feeding the koʻa and collecting limu, are identified as occurring in the bay; however, NMFS does not have information indicating where these activities may occur and whether they might occur in the closure. Therefore, it is not clear from the information obtained during scoping how this alternative would affect activities associated with cultural practice or worship. NMFS has also found no information to indicate that there are any cultural sites located within the proposed closure area that may be affected by this action.

Hōnaunau Bay
Within Hōnaunau Bay, the time area closures may affect fishing on the water, canoe activities, traditional/cultural rituals, swimmers, and boaters. Traditional canoe activities in this bay generally coincide with cultural festivals occurring twice a year, when canoe rides are offered as part of the celebration and educational experience. The closure of the bay may affect the route used for these rides, such that rides may need to be offered outside the closure area. Prohibitions will not apply to canoe races that occur twice a year in the Bay, providing that racing boats maintain their course and transit straight through the closed area and do not stop.

Community members indicated that the local canoe club's paddling practice occurs after 3 PM when the bay would be re-opened, so it would not be affected. They also indicated that the closure may affect boaters and swimmers, because the closure may force swimmers into areas near the boat ramp where boats may be attempting to come in and out of the Bay (Captain Cook community meeting, August 1, 2012). NMFS expects the time-area closure in this area to minimally affect diving and snorkeling activities, as popular snorkeling access areas would

remain open for use outside of the closure area, and diving would mainly occur over the reefs and not over the sand.

Interviews with Native Hawaiian lineal and cultural descendants from Hōnaunau Bay indicated that traditional activities continue to occur in the bay. These traditional activities include fishing; subsistence gathering of ocean resources by cultural practitioners; canoe activities, including fishing from canoes; gathering of cultural resources for spiritual and cultural protocols; medicinal plant usage; ancestral caretaking and worship; worship of akua and aliʻi; and care of burial sites (Honua Consulting 2013).

The closure was delineated in such a way that it would not affect a majority of these activities. Fishing could still occur outside of the closure area at all times of day; fishing within the closure area can also occur in the early morning and late afternoon hours outside of the closure period. The closures will not affect subsistence gathering of limu and paʻakai, or the gathering of terrestrial plants used for lāʻau lapaʻau. Hoe waʻa may be limited to areas outside of the closure or to times when the area is not prohibited.

Cultural practices, such as feeding the koʻa and collecting limu, are identified as occurring in the bay; however, NMFS does not have information indicating where these activities may occur and whether they might occur in the closure. Therefore, it is not clear from the information obtained during scoping how this alternative would affect activities associated with cultural practice or worship. NMFS has also found no information to indicate that there are any cultural sites located within the proposed closure area that may be affected by this action.

Kauhakō Bay

Within Kauhakō Bay, the time-area closures may affect fishing on the water, traditional recreation, and traditional/cultural rituals. During community meetings, local communities expressed concerns regarding restrictions on fishing activities. Although shore-based fishing would be permitted throughout these areas, community members indicated that the closures might affect other fishing activities (Hoʻokena community meeting, September 10, 2012).

Lobster, Kona crab, or trolling fishing activities would need to occur outside of the closure area or times. NMFS identified an exception for traditional fishing activities, and in this particular place, canoes are generally known to launch from the beach in an area that is located adjacent to the time-area closure. Community members expressed concern that without an exception for transit through the area, the canoes would have to be launched before or after the closure time periods or from sections of the coastline that may be more difficult or less safe (Hoʻokena community meeting, September 10, 2012). The exception allows this traditional activity to continue in the area by allowing the boats to transit through the closed areas to practice the activities.

Interviews with Native Hawaiian lineal and cultural descendants from the area indicated that some traditional activities continue to take place in the area. These traditional activities include fishing; subsistence gathering of ocean resources by cultural practitioners; canoe activities, including fishing from canoes; gathering of cultural resources for spiritual and cultural protocols;

medicinal plant usage (lāʻau lapaʻau); and ancestral caretaking and worship, including care of burial sites.

The closure was delineated in such a way that it would not affect a majority of these activities which do not occur at an intensity or frequency likely to result in harassment of spinner dolphins. Fishing could still occur outside of the closure area at all times of day; fishing within the closure area can also occur in the early morning and late afternoon hours outside of the closure period. The closures will not affect subsistence gathering of limu and paʻakai, or the gathering of terrestrial plants used for lāʻau lapaʻau. Hoe waʻa may be limited to areas outside of the closure or to times when the area is not prohibited.

Cultural practices, such as feeding the koʻa and collecting limu, are identified as occurring in the bay; however, information is scarce as to where these activities may occur and whether they might occur in the closure. Therefore, it is not clear from the information obtained during scoping how this alternative would affect activities associated with cultural practice or worship.

Makako Bay
Within Makako Bay, the popular Garden Eel Cove dive spot will be unavailable from 6 AM to 3 PM (see section 3.4.5 for site description), but popular afternoon and evening dives in this area will not be affected and therefore can continue to occur. As a result of the closures, daytime divers, kayakers, and aquarium-trade collectors may need to visit this site outside of the closure times, continue activities outside of the delineation area or select an alternate site to continue activities.

Interviews with Native Hawaiian residents with ties to the area indicated the following activities currently taking place at Makako Bay include fishing; subsistence gathering of ocean resources by cultural practitioners; canoe activities, including fishing from canoes; swimming/snorkeling; kayaking; worship of ancestral guardians (ʻaumākua, specifically hāhālua, or manta ray); and lāʻau lapaʻau.

NMFS does not anticipate the implementation of this alternative to affect subsistence gathering in the intertidal areas and shoreline fishing, or the gathering of terrestrial plants used for lāʻau lapaʻau. Canoe activities, including fishing from canoes, will need to occur outside of the delineated closures or outside of the closure times. Information regarding where and at what times ancestral worship may occur (including for hāhālua) at this bay was scarce; therefore, it is difficult to determine to what degree these activities may be affected.

4.4.4.2 Maui

On the Island of Maui, impacts from the single time-area closure may affect the tour operators that use this site to encounter Hawaiian spinner dolphins in a similar way as on the Island of Hawaiʻi. However, as the only time-area closure implemented on Maui, tour operators will have multiple other areas to encounter spinner dolphins. NMFS describes the economic impacts of this alternative on commercial entities here and in detail in the RIR found in section 5. Boaters that visit the closure to encounter spinner dolphins will similarly be faced with decisions to visit other

locations, return at different times, or to view the dolphins from outside of the closure areas. Impacts may include increased fuel costs.

La Perouse Bay

Within La Perouse Bay, the time-area closure may affect fishing from watercraft, canoe activities, recreation, and traditional/cultural rituals. As a result of the closures, water-based fishing activities and canoe activities may take place outside of the closure times, or outside of the delineation area. In addition, some people may choose to move these activities to other areas. NMFS has identified an exception to the closure that allows the transit into and out of a small boat ramp located on private property abutting the northwest end of the bay. Additional information regarding where and at what times traditional/cultural rituals, recreation, or other activities may occur is scarce; therefore, it is difficult to determine to what degree these activities may be affected.

In contrast to the No Action Alternative, Alternative 4 may alleviate some of the pressures (noted above) that Hawaiian spinner dolphin-directed activities place on the five local communities and their natural resources. Habitats that are used by spinner dolphins but not commonly targeted for spinner dolphin-directed activities may experience an increase in spinner dolphin-directed activities. For example, tour operators or shore-based swimmers could choose to frequent a different area to closely access the dolphins, and these areas may experience increased pressures as a result. It is difficult to determine which areas may receive more attention; generally, those that are still reasonably accessible and are frequented by spinner dolphins may experience this increase.

Interviews with Native Hawaiian residents with ties to the area indicated cultural activities have taken place at La Perouse Bay. Traditional activities identified by the residents include fishing, subsistence gathering of ocean resources by cultural practitioners, canoe activities, recreation, gathering of cultural resources for spiritual and cultural protocols, lāʻau lapaʻau, healing and cleansing rituals, ancestral caretaking and worship, worship of akua and aliʻi, care of burial sites, and care of historical sites (Honua Consulting 2013). In addition, there are also regular navigation practices; gathering of limu, paʻakai, ʻōpihi, and other cultural resources; and educational activities.

The closure was delineated in such a way that it would not affect a majority of these activities. Fishing could still occur outside of the closure area at all times of day; fishing within the closure area can also occur in the early morning and late afternoon hours outside of the closure period. The closures will not affect subsistence gathering of limu, paʻakai and ʻōphihi, or the gathering of terrestrial plants used for lāʻau lapaʻau. Hoe waʻa may be limited to areas outside of the closure or to times when the area is not prohibited.

Cultural practices, such as feeding the koʻa and gathering limu, are identified as occurring in the bay; however, NMFS does not have information indicating where these activities may occur and whether they might occur in the closure. Therefore, it is not clear from the information obtained during scoping how this alternative would affect activities associated with cultural practice or worship. NMFS have also found no information to indicate that there are any cultural sites located within the proposed closure area.

4.4.5 Alternative 5 –Voluntary Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 5 combines the prohibitions associated with Alternative 3 with voluntary time-area closures within five bays that are targeted for spinner dolphin viewing activities. Impacts associated with this alternative would be largely similar to those discussed under Alternative 3 (see section 4.4.4) and may include some additional impacts related to the voluntary time-area closures. To minimize impacts to human activities that are not Hawaiian spinner dolphin-directed, NMFS carefully delineated closure areas to include the areas where spinner dolphins rest but, when possible, to exclude areas used for other activities. At all locations, the intertidal zone is not included in the closures and activities occurring in these areas, such as shore-based fishing and subsistence gathering, are not prohibited and will be able to continue during any time of day. Still, people participating in the voluntary closures will be called upon to limit their ocean-use activities to areas outside the closures or move to new areas where dolphin habitat conservation concerns are lower.

The five area closures all have various user groups that would need to participate in the voluntary closures for this conservation effort to be effective. The five areas are Makako Bay, Kealakekua Bay, Hōnaunau Bay, and Kauhakō Bay on Hawai‘i Island, and La Perouse Bay on Maui. Under this alternative, NMFS anticipates that the prohibitions for time-area closures from 6 AM until 3 PM will affect both Hawaiian spinner dolphin-directed activities and non-dolphin-directed activities differently in each bay. The magnitude of the impact will largely depend on where the activity takes place, whether alternative areas are available for the activity to continue, whether the activity may occur outside of the closure times and whether the people engaged in the activity are willing to comply with voluntary closures. If communities are able to gather support for time-area closures and participation is consistent, the impacts discussed under section 4.4.4 above would apply for each bay. However, differing motivations among resource users in the different areas could lead to inconsistent participation in the time-area closures and lead to conflict between ocean-users with differing beliefs.

4.4.6 Summary of Impacts to Social and Cultural Resources

Table 20 (below) describes impacts to social and cultural resources under the No Action Alternative. Table 21and Table 22 (below) provide symbols to summarize expected changes to the social and cultural resources including dolphin-directed and wildlife related activities, and recreational and community-based activities (described throughout section 4.4) associated with the implementation of the various alternatives. Table 23 (below) uses the established symbols to describe the anticipated impacts of each alternative in comparison to the No Action alternative. As some impacts are expected to vary among groups two symbols may be used to describe potential impacts. For example, impacts to independent dolphin-directed individuals for Alternative 2 are expected to vary with some individuals choosing an alternative platform to engage in dolphin-directed activities and other individuals choosing to engage in an alternative recreational activity.

Table 15: Summary of No Action impacts

Groupings	Types of Activities/Users	No Action Description
Dolphin-directed and wildlife related activities	Swim-with wild dolphin tours	With no prohibitions directly addressing dolphin-directed activities, activities are expected to continue and increase. Over time, impacts from viewing and interaction are expected to adversely impact spinner dolphins causing habitat displacement and declines in local populations (see Table 12). These changes may influence the industry's ability to locate large groups of dolphins in the same areas. This may impact the cost of business either in costs of travel or sales.
	Spiritual retreats with dolphin-oriented swim	
	Dolphin-watch tour operators	
	Generalized commercial boat tour operators	
	Non-motorized vessel tour operators	
	Rental companies (boat, watercraft, and equipment)	
	Non-commercial dolphin-directed activities (Independent individuals including residents and tourists)	
Recreational and community-based activities	Swimmers	All activities in the bays are expected to continue under this alternative. Communities adjacent to targeted essential daytime habitats report competition with dolphin-directed activities and adverse impacts to local community resources including: reduced dolphin numbers and use of the bays, disturbance to fisheries and fishery related activities, degradation to the marine and coastal resources, strains on public facilities and services, and displacement of community members and activities. Overtime these impacts may increase.
	Boaters and other watercraft	
	Fishers	
	Other recreational users	
	Native Hawaiian (gathering and practices)	
	Local Communities	

Table 16: Symbols for Dolphin-directed and wildlife related activities

Impact Level Symbols	Dolphin-directed and wildlife related activities					
	Swim-with wild dolphin tour	**Spiritual retreat (with dolphin oriented swim)**	**Dolphin-watch tour**	**Generalized tour**	**Kayak tours or rental companies**	**Independent (*i.e.*, not part of a tour or retreat) dolphin-directed individuals**
+	This type of tour activity may see slight increases in sales due to prohibitions on other types of activities			This type of tour activity may see slight increases in sales due to prohibitions on other types of activities		Individuals choose an alternative recreational activity
0	No appreciable change is expected			No appreciable change is expected		No appreciable change is expected
-	Close approach prohibitions cause a small reduction in sales			Tours may experience a small reduction in sales relative to their dependence on dolphin-directed customers		No swim-with regulations cause individuals to seek another platform for close approach
- -	Prohibitions directly impact activities offered by tour and may appreciably reduce sales if an alternative activity is not offered			Scenario not described		Prohibitions directly impact all close approach activities

Table 17: Symbols for Recreational and community-based resources and activities

Impact Level Symbols	Recreational and community-based resources and activities					
	Swimmers	Boaters and other watercraft	Other recreational users	Fishers	Native Hawaiian practices	Local Communities
++	Appreciable reductions in dolphin viewing and interaction may enhance the quality of marine and coastal resources, allowing for enhanced use of available resources			Appreciable reductions in dolphin viewing and interaction may enhance the quality of marine and coastal resources, allowing for enhanced use of available resources		
+	Small reductions in dolphin viewing and interaction may slightly reduce competition for space in targeted essential daytime areas			Small reductions in dolphin viewing and interaction may slightly reduce competition for space in targeted essential daytime areas		
0	No appreciable change is expected			No appreciable change is expected		
-	Closures create space and time limitations in five bays and/or prohibitions may require increased vigilance around spinner dolphins			Closures create space and time limitations in five bays for those activities not excepted and/or prohibitions cause a displacement of activities		

Table 18: Summary of Social/Cultural Impacts (refer to Tables 23 and 24 for definitions of symbols)

Alternatives		Dolphin-directed and wildlife related activities (refer to criteria in Table 21)							Recreational and community-based activities (refer to criteria in Table 22)					
		Swim-with Dolphin tour	Spiritual Retreat (with dolphin swim)	Dolphin-watch tour	Generalized tour	Non-motorized vessel tour operators	Rental companies	Independent dolphin-directed individuals	Swimmers	Boaters and other watercraft	Other recreational users	Fishers	Native Hawaiian (gathering and practices)	Local Communities
1.	No Action	0	0	0	0	0	0	0	0	0	0	0	0	0
	Relative to the No Action													
2.	Swim-with Regulation	- -	- -	0	0	0	0	+/-- /-	-	0	0	0	0	+/-
3(A).	Swim-With and 50 Yard Approach	- -	- -	-	0	-	-	+/--	-	-	0	0	0	+
3(B).	Swim-With and 100 Yard Approach	- -	- -	--	0	-	-	+/--	-*	-*	0	0	0	+
	Mandatory Closures and Swim-With and Approach Regulations	--	--	--	0	-	-	+/--	-*	-*	-	++/-	++/-	++/-
4	Areas Outside Closures	--	--	--	0	-	-	+/--	-*	-*	0	0	0	+
	Voluntary Closures and Swim-With and Approach Regulations	--	--	--	0	-	-	+/--	-*	-*	0/-	++/0/-	++/0/-	++/+/-
5	Areas Outside Closures	--	--	--	0	-	-	+/--	-*	-*	0	0	0	+

4.5 Cumulative Effects

NEPA defines the cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Section 3.0, Affected Environment, describes the status of each resource, which reflects the effects of past and current actions. Chapter 4, Environmental Consequences, evaluated the effects of no action and eightaction alternatives on the status of potentially affected resources. This section now considers the cumulative effects of the alternatives on the resources identified as potentially affected in preceding sections of Chapter 4: Hawaiian spinner dolphins; other protected marine species; protected marine habitats; and social and cultural resources located within the time-area closures — where such effects might occur in the context of the effects of past actions, current conditions, and reasonably foreseeable future actions and conditions. Cumulative effects to other resources identified in Chapter 3, Affected Environment, including the protected marine habitats and social and cultural resources located outside of the time-area closures would be limited to potential displacement of activities from time-area closure sites to other areas. However, this would likely be negligible due to the number of users in these areas relative to the total number of users and available areas; the time-area closures would also only limit actitivties in these areas during certain times of day.

4.5.1 Cumulative Effects on Hawaiian Spinner Dolphins

4.5.1.1 Cumulative Effects of External Factors

External factors or actions that have affected, may be affecting, or may have future impacts on Hawaiian spinner dolphins include interactions with recreational or commercial fisheries, military training exercises in the Hawai‘i Range Complex, marine debris, coastal and in-water development, increased human populations, increased vessel traffic and future conservation efforts.

The NMFS 2018 Stock Assessment Report (SAR) provides limited information regarding fishery interactions with island-associated Hawaiian spinner dolphins; however, the gear types used in Hawaiian waters are responsible for mortality and serious injury of marine mammals in other U.S. waters (Carretta *et al.* 2019). One concern in Hawaiian waters is inshore gillnets: limited records indicate spinner dolphins taken in nets or net fragments, and an eyewitness account of a dead spinner dolphin removed from an inshore gillnet on O‘ahu was recorded in 1990 (Nitta and Henderson 1993). The State of Hawai‘i has implemented regulations (HAR 13-75) for lay gillnets in efforts to minimize this threat to protected species, such as Hawaiian spinner dolphins. However, near-shore fisheries, such as inshore gillnet fisheries, are not observed or monitored and some incidents may go unreported. The 2013 SAR reports that no spinner dolphins were observed hooked or entangled in Hawai‘i's longline fisheries between 2006 and 2010, and the likelihood of interactions between these fisheries and island-associated spinner dolphins is reduced due to the 50–75 nm MHI longline Prohibited Area zone established under 50 C.F.R. § 229.37 (Carretta *et al.* 2013). Interactions with other types of fishing gear, including shortlines, are largely unknown.

The Hawai‘i Range Complex encompasses certain large marine areas around the MHI. Within this area, the Department of Defense conducts various training and testing activities, including the use of low- and mid-frequency active sonar for detecting simulated enemy submarines; live-fire weapons training; detonating torpedoes, mines, and grenades underwater; and simulated anti-submarine warfare. These training and testing exercises can affect marine mammals by disrupting their hearing capabilities and causing behavioral changes resulting in Level B harassment as defined under the MMPA. Some of the testing activities also have the potential to injure marine mammals (Level A harassment). The U.S. Navy consults with NMFS on these exercises to minimize harm to protected resources, such as Hawaiian spinner dolphins. Through this consultation process, mitigation measures, procedural protocols, and research efforts are determined to allow for essential training and testing activities.

The U.S. Navy has received two Letters of Authorization (LOAs) from NMFS to take a specific number of marine mammals under the U.S. Navy Training and Testing Activities in the Hawai‘i-Southern California Training and Testing Study Area. The LOA for training allows for 11,060 (approximately 2,212 per year) spinner dolphins to be taken by Level B harassment over the 5-year period from 2020 to 2025 (NMFS 2020), and no spinner dolphins to be taken by Level A harassment. The LOA for testing allows for 835 (approximately 167 per year) spinner dolphins to be taken by Level B harassment, and 5 (approximately 1 per year) to be taken by Level A harassment over the same 5-year period (NMFS 2020). These authorizations include both the Hawai‘i Range Complex and the Southern California Range Complex and are also subject to a stipulated settlement agreement in *Conservation Council for Hawai‘i v. National Marine Fisheries Service* (D. Haw); 14-cv-00153. However, it is not specified how many of the spinner dolphin takes may be resident Hawaiian spinner dolphins. Execution of military training activities is expected to continue in the foreseeable future to ensure troop preparedness for matters of national security.

Marine debris is a growing concern within the marine environment, as it poses multiple threats to the marine ecosystem. For instance, marine debris poses a risk of entanglement (see the SARs information reported above for Hawaiian spinner dolphins) or ingestion (either directly or through prey items) to cetaceans. Impacts associated with these threats include drowning; debilitation; limited predator avoidance, internal or external wounds, skin lesions or sores; blockage of the digestive tract, resulting in starvation that often leads to death; reductions in quality of life and/or reproductive capacity; impairment of feeding capacity; and the introduction and/or concentration of damaging or toxic compounds to the animal (Derraik 2002). Confirmation of fatal debris interactions for cetaceans is likely to be lost at sea in many cases and as a result, the severity of the effects of debris interactions on cetacean populations remains unclear (Baulch and Perry 2014). However, Baulch and Perry (2014) report that 58% of cetacean species have been documented either ingesting or becoming entangled in debris, and note that debris ingestion may vary among and between species, depending on geographic differences in debris abundance and feeding habits. The researchers did not provide any specific information regarding regard Hawaiian spinner dolphin debris ingestion.

While there is insufficient information available to determine the severity of the threat of direct ingestion of macro (large) debris to Hawaiian spinner dolphins, some information indicates that spinner dolphin prey species may be consuming micro (very small) plastics. Boerger *et al.*

(2010) examined plastic ingestion by fish in the North Pacific Central Gyre and found that 35% of mesopelagic fish analyzed (many of which were myctophids, or lantern fishes, which are spinner dolphins' main prey) had ingested plastic and that larger fish generally had more pieces of plastic in their guts than smaller fish. The effects of this plastic consumption on the myctophids or the potential for accumulation in their predators are not well understood and warrant further research. Of particular concern is the ability for plastic debris to absorb organic pollutants that may be toxic to marine organisms. Takahashi *et al*. (2000) found high levels of butyltin and organochlorine (chemical compounds found in some plastics) in migrating myctophid species sampled from the Western North Pacific, which may indicate a cause for concern for predators such as spinner dolphins.

The shallow, sheltered bays that Hawaiian spinner dolphins use to rest often overlap with areas that are popular for recreation and development. Increased human traffic and development in these near-shore areas often degrades the quality of these habitats. Activities that contribute to the degradation of the habitat and which may have additive impacts on these areas or animals include those that alter the quality, quantity, or availability of resting habitats for spinner dolphins, such as pollution and/or run-off from coastal and in-water development, increased vessel use in marine areas, in-water construction of structures (such as piers and aquaculture), and increased recreational use of essential daytime habitats. NMFS expects these types of human influences to continue to influence the quality of habitat into the future with continued human population growth and development.

Activities that encroach into Hawaiian spinner dolphin essential daytime habitats could include newly building or expanding near-shore aquaculture facilities, constructing renewable energy development projects, or creating or expanding harbors. The construction of new, improved or expanded harbors, both recreational and commercial, may be of particular concern for spinner dolphins because they would add to the existing boat traffic in Hawai‘i, increase the number of available slips and possibly become a new operation base for Hawaiian spinner dolphin-focused tour boats. In addition, acoustic disturbance and the potential for vessel strikes would increase as vessel traffic increases in these areas. Harbor expansion or improvement projects that are planned or already in the works include Honolulu Harbor, Kawaihae Harbor, Kalaeloa Barbers Point Harbor and Lahaina Small Boat Harbor.

In 2015, Blue Ocean Mariculture (formerly known as Kona Blue) was issued a permit by the US Army Corp of Engineers authorizing changes in Blue Ocean Mariculture's Conservation District Use Permit to replace and expand the existing net pen grid system at the mariculture lease area off the Kona coast. The expansion includes increasing the maximum growing volume from 24,000 m3 to 64,000 m3; increasing the number of pens from five to eight; and increasing the maximum pen size of individual pens from 7,000 m3 to 8,000 m3. The lease area is located immediately offshore of the Hawaiian spinner dolphin essential daytime habitat at Makako Bay. There are no reported incidents of behavioral modification at this site involving spinner dolphins. The expansion of the site may affect the dolphins due to the noise disturbance from increased vessel traffic; however, it is unknown whether this may cumulatively affect the animals in combination with the existing tourism vessel traffic, or whether this may cause avoidance of this site in the future.

The State of Hawai‘i has pursued plans to expand Honokōhau Harbor on the island of Hawai‘i in response to public demand for a larger facility that increases the number of slips. In 2007, the state proposed the Kona Kai Ola development plan, which included blasting out the lava rock harbor basin to increase the size to accommodate an 800-slip marina, as well as constructing new developments such as shopping areas and condominiums (Oceanit 2007). This expansion proposal has not been completed and any future expansion is uncertain. Impacts to Hawaiian spinner dolphins would occur in the short term from the blasting during the construction phase, as well as over the long term from the increase in boat traffic passing through the spinner resting area at the mouth of the harbor.

Increased development along Hawai‘i’s shoreline also affects water quality in Hawai‘i’s waters that Hawaiian spinner dolphins use as essential daytime habitat. Although spinner dolphins aren’t feeding in these areas, changes to the local water quality may affect the local ecosystem, altering the clarity of the water and potentially reducing the dolphins’ ability to detect predators. In addition, land-based pollution, such as herbicides, pesticides, and fertilizers, can transfer to marine environments in run-off and become widely distributed in Hawai‘i’s waters. These pollutants could compromise the health and fitness of spinner dolphins and/or their prey species. Local, State, and/or Federal measures taken to minimize non-point source pollution and run-off may minimize some water quality impacts in the future; however, developed areas still present risks to the quality of Hawai‘i’s waters. More information on these measures can be found on the following website: http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/polluted-runoff-control-program/.

Point-source water pollution can also be a major concern for marine life. Higher risk areas for Hawaiian spinner dolphins include locations where essential daytime habitat overlaps with shipping routes and/or oil refineries, such as on O‘ahu. For example, the potential for oil spills could result from shipments of crude oil and refined oil products by oil tankers sailing into and out of the Kalaeloa Barbers Point Harbor on O‘ahu. There are currently two refineries located at Campbell Industrial Park, which are interconnected by pipelines to this harbor — the Chevron refinery, which processes 55,000 barrels per day, and the Par Petroleum refinery (formerly owned by Tesoro), which processes 94,000 barrels per day. Most of this oil remains on O‘ahu for use at the electric generation facility at Kahe Point and for local vehicle use, and some of it is refined on O‘ahu and then shipped to neighbor islands for use. Fuel products, such as jet fuel, are also shipped into Honolulu Harbor. Harbors on the neighbor islands used by incoming fuel tankers include Hilo and Kawaihae harbors on Hawai‘i Island Kahului Harbor on Maui and Nawiliwili and Port Allen harbors on Kaua‘i. More information on current use and future development of Hawai‘i’s fuel processing facilities can be found at the following website: http://hidot.hawaii.gov/harbors

Oil spills from commercial vessels are uncommon but still possible. Although there are emergency equipment and plans in place to address this should it occur, the impacts of any oil spill at Kalaeloa Barbers Point Harbor could be distributed northward by prevailing currents (http://oos.soest.hawaii.edu/pacioos/focus/modeling/ROMS_compare_variable.php) to areas along the Wai‘anae coast, where spinner dolphins are known to transit and rest.

Future increases in human population in the Hawaiian Islands will inevitably lead to increases in vessel traffic. Potential impacts to Hawaiian spinner dolphins from vessel traffic include acoustic disturbance from vessel noise that can disrupt dolphins' hearing, prey detection, and communication capabilities; and vessel strikes that may injure or kill dolphins. Dolphins may also temporarily move away from an area that is disrupted by heavy vessel traffic (Lusseau 2004). Many species of marine mammals have been observed with what appear to be injuries or scars from propeller strikes, which may debilitate or reduce the animal's capacity to cope with other increased stressors in the environment. Spinner dolphins that are known to rest in high vessel traffic areas, such as Kailua Bay, Honokōhau Harbor, and the Wai'anae Coast, are more susceptible to these vessel impacts.

While many human-influenced activities may result in negative impacts to Hawaiian spinner dolphin populations, conservation efforts sometimes beneficially affect these resident populations.

The State of Hawai'i has proposed a management plan for Kealakekua Bay to protect the significant biological, cultural, and historical resources found within the park's boundaries. Some management strategies suggested in the Kealakekua Bay State Historical Park Master Plan (http://www.beltcollins.com/kealakekua/plans_reports.html) include, but are not limited to, reducing the use of the entire area, reducing the use of problem areas, changing the location of use within problem areas, changing the timing or type of use, and changing visitor behavior and expectations, among others. The Division of State Parks is currently reviewing this proposal and may implement some or all of its recommendations in the future. Should the state adopt this plan, it may provide additional protection to Hawaiian spinner dolphins within the bay by limiting human access. However, a potential negative impact has also been identified — usage spillover that could occur to the adjacent area of Hōnaunau — if these measures are implemented at Kealakekua Bay.

4.5.1.2 Cumulative Effects of the Alternatives on Hawaiian Spinner Dolphins

Under the No Action Alternative, NMFS would continue to promote the Dolphin SMART guidelines and enforce mandatory MMPA prohibitions, but would not adopt regulations to reduce human-caused disturbance of Hawaiian spinner dolphins. Under this alternative, the current levels of disturbance described in Chapter 3 would likely continue and, as described in section 4.2.1, could increase. These increasing levels of disturbance may interact with the factors described above to harm the fitness of individual Hawaiian spinner dolphins and the population as a whole. Continuation of these risks, in combination with the other discussed negative effects, could have negative cumulative effects on resident Hawaiian spinner dolphins.

Under the various proposed action alternatives, NMFS would implement approach regulations and/or time-area closures in an effort to enhance protections for Hawaiian spinner dolphin to prevent disturbance within Hawai'i's waters. Potential benefits to spinner dolphins from each of these alternatives may help offset the negative cumulative effects described above. For example, Alternatives 2 and 3 propose various approach restrictions, which may reduce stresses from human disturbance on spinner dolphin populations throughout their essential daytime habitat. Alternative 4 would provide the maximum amount of relief from human disturbance by not only

restricting swimming with and closely approaching the dolphins, but also ensuring that the five bays, which are considered essential daytime habitats, would be free from all manner of human disturbance during the closure period. Alternative 5 is expected to provide similar benefits to the dolphins as Alternative 3.

4.5.2 Cumulative Effects on Protected Marine Species and Habitats

4.5.2.1 Cumulative Effects of External Factors

Protected marine species and habitats face multiple threats within their environment, including interactions with fisheries, interactions with people, and actions that degrade habitats (pollution, run-off, and encroachment by in-water development). The specific details of the threats to ESA-listed species are discussed in the recovery plans for green sea turtles (http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_pacific.pdf), hawksbill sea turtles (http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_hawksbill_pacific.pdf), and Hawaiian monk seals (http://www.nmfs.noaa.gov/pr/pdfs/recovery/hawaiianmonkseal.pdf). Threats to false killer whales are discussed in detail in the Final Rule to list the MHI Insular False Killer Whales Distinct Population Segment as endangered under the ESA (77 FR 70915, November 2012). More specific threats to other potentially affected marine mammals are discussed within the most recent Stock Assessment Reports for these species (http://swfsc.noaa.gov/publications/TM/SWFSC/NOAA)

Protected marine species and habitats are susceptible to many of the same cumulative impacts as those affecting Hawaiian spinner dolphins (discussed in section 4.5.1). For example, non-point source pollution from runoff can affect the health of marine protected species and habitats in many ways. For Hawai‘i’s green sea turtles, recent studies have shown a link between runoff that is high in nitrogen, such as from agriculture and land development, and the disease fibropapillomatosis (Van Houtan *et al*. 2014). Cumulative impacts to protected marine species and habitats from recreational or commercial fisheries, military training exercises in the Hawai‘i Range Complex, marine debris, coastal and in-water development, increased human populations, and increased vessel traffic would likely be similar to those experienced by spinner dolphins.

Conservation efforts for protected marine species and habitats are often driven by responsibilities given to NMFS under the ESA, MMPA, and MSA; however, multiple stakeholders play roles in advancing conservation for these resources, including Federal agencies, State and County agencies, and non-profit organizations. These range in effort from educational information supplied to the public, to regulatory measures that address specific threats. Despite these efforts, protected resources, such as sea turtles, marine mammals, and EFH, continue to face many challenges in the marine environment, and the additional impacts within their environment from this action must be considered in combination with the other threats the species currently face to ensure the health and survival of these species.

Federal conservation actions to benefit protected marine species and habitats that are planned or currently underway include the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS) Management Plan revision, and recovery planning efforts for various protected species. While the conservation actions are designed to reduce the threats and stressors

experienced by the species, it is unknown if the negative cumulative effects caused by increasing human populations and activities may be reduced over the long term by these actions.

4.5.2.2 Cumulative Effects of the Alternatives on Protected Marine Species and Habitats

Species that have been identified as having the potential to be affected by the alternatives include green and hawksbill sea turtles, giant manta rays, Hawaiian monk seals, humpback whales, and other near-shore species that may be sighted, such as short-finned pilot whales, pantropical spotted dolphins, rough-toothed dolphins, common bottlenose dolphins, and false killer whales.

Under the No Action Alternative, NMFS would continue to promote the Dolphin SMART guidelines and enforce mandatory MMPA prohibitions, but would not adopt regulations to reduce human-caused disturbance of Hawaiian spinner dolphins. As a result, the current levels of disturbance described in Chapter 3 would continue and could increase. Protected species using habitat overlapping with spinner dolphin essential daytime habitats targeted by people wanting to interact with the dolphins may subsequently be disturbed by the increased number of people drawn in by spinner dolphin-directed activities, leading to increased stress levels or displacement from these habitats. In combination with the other negative effects discussed in section 4.5.2, the No Action Alternative could have negative cumulative effects on marine protected species.

Under the various proposed action alternatives, NMFS would implement approach regulations and/or time-area closures in an effort to enhance protections for Hawaiian spinner dolphin and prevent disturbance within 2 nm from the MHI shoreline. Protected species may be affected by these regulations in multiple ways. NMFS does not anticipate the approach regulations under Alternatives 3, 4, and 5 to affect sea turtles, giant manta rays, Hawaiian monk seals, or humpback whales. Under Alternative 4 and to a lesser extent under Alternative 5, sea turtles, giant manta rays, and Hawaiian monk seals that use essential daytime habitats closed for enhanced spinner dolphin protection may experience protection from disturbance in these areas during the closed times. Despite the risks inherent with buoy installation, maintenance and existence, NMFS anticipates the enhanced protection provided by time-area closures will benefit these species over time, which may in turn offset some of the cumulative impacts that threaten them.

Other commonly sighted near-shore marine mammal species, as described above, may experience some negative cumulative impacts from the action alternatives when added to the stressors discussed in section 4.5.2, because tour vessels could redirect their attention to a cetacean species that is considered less regulated. However, other cetaceans do not exhibit the same daily and behavioral patterns as spinner dolphins which leaves them difficult to predict or locate their location. Although MMPA take prohibitions apply to all marine mammal species and vessel operators must comply with those prohibitions, the potential for displacement of the Hawaiian spinner dolphin-focused tour activities to other cetacean species is possible.

The educational benefits provided by the regulations implemented to enhance protections for Hawaiian spinner dolphins, in combination with the voluntary Dolphin SMART program, may aid in ameliorating negative cumulative impacts discussed above. For example, if the public

recognizes that the behaviors that can cause negative impacts to spinner dolphins could affect other cetacean species similarly, they may feel a social responsibility to voluntarily provide the same protections for these species by providing viewing options at a safe distance. In contrast, but with similar results, some operators may be motivated by a fear of future regulations to provide protection to other cetacean species by viewing these species at a respectful distance. The exact response tour operators and other user groups may have to these types of regulations is still uncertain; therefore, it is uncertain if the action alternatives, in combination with other impacts on these protected species, could result in a negative or positive cumulative effect on these species.

Cumulative effects to EFH under action Alternatives 4 and 5 would be minimal because of the mitigation measures that would be employed to avoid any adverse effects caused by buoy installation. All other alternatives would not cumulatively affect EFH.

4.5.3 Cumulative Effects on Social and Cultural Resources

4.5.3.1 Cumulative Effects of External Factors

Past, present and reasonably foreseeable future actions that may affect social, cultural, and traditional practices and cultural and historic properties are discussed in this section. Among the primary past human activities that have affected social and cultural resources and traditional cultural practices within the affected environment is the extensive coastal development (residential, commercial, and governmental) that has taken place within the MHI since the 1950s. Areas of native coastal vegetation have been disturbed and shoreline access has been restricted. Overfishing from commercial, recreational, and even subsistence fishing has also resulted in a depletion of traditional marine subsistence resources (PIFSC 2011, Moffitt *et al*. 2006). Significant storm events, such as hurricanes and tsunami events, have affected traditional cultural resources in the MHI due to storm damage or debris. Continued development, overfishing, and future climate change (discussed in section 4.5.5) have the potential to further affect these resources.

A variety of cultural and historical properties are present within the project area (the entire geographic scope of the actions). Past actions on cultural and historic properties within the project area that may have caused impacts include, but are not limited to, coastal human settlements or extensive coastal development (residential, commercial, and governmental) that has taken place within the MHI since the 1950s; earth-moving activities for residential, commercial, government or transportation projects; military operations or warfare; looting or other deleterious activities; and significant storm events, such as a hurricanes or tsunamis. Both surface structures and buried cultural deposits have been disturbed or destroyed. While awareness and protection of cultural and historic resources throughout Hawai‘i is supported through legislation such as the NHPA and State regulations, potential impacts to these resources could still occur as a result of the same activities and events listed as past actions.

4.5.3.2 Cumulative Effects of the Alternatives on Social and Cultural Resources

Cumulative effects of the alternatives on social and cultural resources would likely only occur under Alternative 4 due to implementation of the mandatory time-area closures. Activities such as subsistence fishing; canoe, stand-up paddleboard (SUP), and kayak paddling; gathering of marine resources; swimming, snorkeling, and diving; and surfing will not be affected by alternatives 2 and 3 because these alternatives do not limit the time or place that these activities can occur, except to prohibit close ecnounters with spinner dolphins. Under Alternative 5, cumulative impacts to social and cultural resources are likely to be similar to Alternative 3 due to the voluntary nature of the time-area closures and the probability of non-compliance.

Closing areas under Alternative 4 may cumulatively add to the impacts on the cultural practices of fishing and gathering of traditional marine subsistence resources at these sites by further reducing the availability of already limited resources. Alternative 4 may incrementally add to any cumulative impacts occurring to these activities because access will be restricted during the closure times. However, the activities can still take place in the areas outside of the time-area closures at the five bays. Fishing can be done from shore, and limu, opihi, and paakai can be gathered from the shoreline. Vessels used for traditional subsistence fishing will be allowed to travel through the closure areas to fishing grounds located outside of the time-area closures, as described in the exceptions to the regulations (Sect. 2.7.3), which would lessen the cumulative impact on these activities. Cultural activities related to canoe races that simply transit through the closed areas will be protected under the exception provided in the regulation. Much of the closure area at Kealakekua Bay already has restrictions on fishing under the State of Hawai‘i’s designation as an MLCD. In subzone A, all fishing, taking, or injuring of marine life is prohibited, as is the anchoring or mooring of boats, except at locations or moorings designated by DLNR.

Closing areas will also affect when and where local residents as well as tourists will be able to access the ocean for activities such as swimming, snorkeling, diving, and canoe, SUP, and kayak paddling. Although Kealakekua and Hōnaunau bays are popular sites for these types of activities, there are many other access points along the Kona coast of the Island of Hawai‘i where people can go to enjoy ocean activities. In particular, Alternative 4, and to a lesser extent Alternative 5, may provide a positive cumulative impact to the communities of Hōnaunau and Ho‘okena by reducing the number of visitors to these sites and the impacts on their cultural resources.

NMFS will further consider, and attempt to minimize, any cumulative impact to historic properties through section 106 consultation under the NHPA.

4.5.4 Cumulative Effects on Economics

4.5.4.1 Cumulative Effects of External Factors

Cumulative effects on the economics of the action area include changes in the tourism industry, operational costs for Hawaiian spinner dolphin-focused tour operators and resident population numbers and/or distribution. For example, increases or decreases in the numbers of visitors coming to the islands may affect the tour businesses’ profits, either positively or negatively. A rise in fuel prices may require spinner dolphin-focused tour operators to raise prices to cover higher fuel costs or to operate with smaller profit margins. Communities may also experience

cumulative impacts to cultural resources from increased numbers of visitors and/or new residents, as they compete with local residents for availability of limited ocean recreational opportunities and resources.

The 2014 Annual Report from the State of Hawai‘i Department of Business, Economic Development and Tourism (State of Hawai‘i 2014) suggests that the State’s economy is growing, and tourism is on the rise. In 2014, from the tourism sector, Hawai‘i experienced a record number of visitor arrivals, and this was projected to remain strong. However, since March 2020 the Hawaii tourism industry experienced a significant drop in travel and tourism-related business activities. In April 2020, a total of 4,564 visitors arrived in Hawaii, a 99.5% decrease from the number of visitors that arrived in April 2019 (https://www.hawaiitourismauthority.org/media/4635/april-2020-visitor-statistics-press-release-final.pdf). While tourism has increased in the state over the last year with 171,976 visitor arriving in Hawaii in January 2021, this number represents a 70% decline compared to January 2020 (https://www.hawaiitourismauthority.org/media/6832/january-2021-visitor-statistics-press-release-final-2.pdf). The tourism industry has faced immediate financial challenges and businesses that rely on tourism have been financially impacted from the COVID pandemic. Although it is not known when tourism will return to pre-COVID levels, we anticipate that that dolphin directed activities would resume to pre-shutdown levels in the future.

The State’s population is growing and the distribution of the population is also changing, with the most recent census data from 2010 showing an increase in population of 1.2% over the previous census in the year 2000. The total population on the Island of Hawai‘i in 2010 was 185,079 people, which accounted for 13.6% of the State’s population. At 24.5%, Hawai‘i Island had the highest population growth rate across the state between 2000 and 2010. The total population on Maui in 2010 was 144,444, and the island had the second highest growth rate in the state between 2000 and 2010 (22.8%). The total population on Kaua‘i was 66,921 in 2010, which amounts to an increase of 14.8 percent from 2000. The total population on the island of O‘ahu in 2010 was 953,207. O‘ahu's population grew by 8.8% between 2000 and 2010, but its share of the state population dropped from 72.3% in 2000 to 70.1% in 2010. These numbers reflect major shifts in resident populations from O‘ahu to the neighbor islands. More information can be found at the following website: http://files.hawaii.gov/dbedt/census/Census_2010/Info_release/2010_Census_Report_3_Informational_Release.pdf

4.5.4.2 Cumulative Effects of the Alternatives on Economics

Under action Alternatives 2 through 5, NMFS would impose mandatory restrictions on vessels, Hawaiian spinner dolphin-directed human activities, and/or time-based site restrictions. Alternatives 2, 3, 4, and 5 would place restrictions on approaching spinner dolphins that would be more restrictive than current guidelines, and Alternatives 4 and 5 would place restrictions (either mandatory or voluntary) on entering or remaining in spinner dolphin essential daytime habitat. The impacts of the restrictions could have cumulative effects when considered with other current and potential future events that affect the tour vessel industry. For Alternatives 4 and 5, provided they are operating in accordance with all applicable law, tour operators could select alternative areas to visit for clients to experience spinner dolphin groups. Raised prices in fuel

coupled with increased travel time could result in cumulative effects on tour profits; however, any long-term projection of world oil prices and effects on fuel costs is highly uncertain.

Some of the action alternatives may result in cumulative impacts to communities, when coupled with changes in tourism and resident population numbers and distribution, by reducing the numbers of both local residents and visitors that have been coming to these small villages and cultural sites looking for close encounters with Hawaiian spinner dolphins. These could be considered either positive or negative: positive cumulative impacts may result from reduced competition for limited cultural resources and recreational opportunities, but some local residents and companies may experience a loss of income from the reduced demand for close encounters with the dolphins, including, kayak rentals and companies offering spinner dolphin-focused spiritual retreats. Visitors who participate in dolphin-swim activities also use lodging, food, car rentals or other industries that provide goods and services. These industries could potentially see some loss in revenue; however, dolphin-swim participants may likely still travel to Hawaii and participate in a wide variety of other ocean based activities that could include swimming or vessel based wildlife viewing, even if they could not swim with dolphins. Weiner (2016) found that 78% of the respondents would still participate in a dolphin tour, even if they could not go in the water with dolphins. Additionally, many of the businesses that indirectly support visitors for dolphin directed activities serve a much larger number of local, U.S., and international visitors to seeking a wide range of experiences and have a wide customer base.

4.5.5. Impacts of Climate Change

4.5.5.1 Cumulative Effects of External Factors

Over the period of 1880 to 2012, the global mean temperature has increased by approximately 0.85°C (1.5°F) (IPCC 2013). Climate change affects all of Earth's ecosystems, both terrestrial and marine. There is widespread scientific agreement that the primary cause of climate change is the rapid increase in emissions of carbon dioxide (CO_2) and other greenhouse gases (GHG) into the atmosphere since the beginning of the industrial era (IPCC 2013). Greenhouse gases in the atmosphere trap heat, which raises air and water temperatures, causing ecological consequences. Increases in air and sea surface temperatures have led to increases in the rate of melting of polar ice caps and resulting increases in sea level. The oceans are also affected as they absorb increasing concentrations of CO_2; the ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide (IPCC 2013). As the CO_2 level in the ocean increases, oxygen levels decrease, leading to ocean anoxia (Draper 2010). An additional consequence of increasing CO_2 in the ocean is increased ocean acidity. Acidification of ocean waters can affect various species by inhibiting exoskeleton and shell growth. All of these effects of climate change are projected to continue and increase into the future. Many species may not be able to acclimate or adapt quickly enough to survive these changing conditions. However, consequences are difficult to predict in many cases because, in general, there are several major sources of uncertainty associated with the most recent projections of global climate change, including the projected rate of increase for GHG concentrations, the strength of the climate's response to GHG concentrations, large natural variations, and ecosystem responses to changes in the climate.

Marine mammals and other highly mobile species can respond more rapidly to effects of climate change than their terrestrial counterparts (Harwood 2001). The most likely impact of climate change on cetaceans will be changes in the area populations currently occupy, due to factors such as the distribution of prey species with particular thermal requirements. The ranges of 88% of cetaceans may be affected by changes in water temperature resulting from global climate change (McLeod 2009). Although oceanic cetaceans are unlikely to be directly affected by rises in sea levels, important habitats for coastal species and species that require coastal bays and lagoons for resting or breeding, such as spinner dolphins, could be adversely affected in the future (Simmonds and Elliot 2009).

The effects climate change will have specifically on Hawaiian spinner dolphins are unclear. There have not yet been any scientific studies directed at answering this question. Based on existing information, however, NMFS anticipates that climate change is most likely to affect spinner dolphins indirectly, by affecting the abundance and distribution of their prey, their community structure, and their susceptibility to disease and contaminants (Learmonth *et al.* 2006). These impacts may, in turn, affect the reproductive success and survival of individual spinner dolphins, which has larger consequences for the success of the population.

Hawaiian spinner dolphin abundance and distribution are determined by the abundance and distribution of their prey species. Spinner dolphins follow both the horizontal and vertical diel migrations of their prey (Benoit-Bird and Au 2003) to feed on the mesopelagic boundary community of fish, shrimp, and squid (Norris *et al.* 1994). These organisms feed on plankton, the primary producers responsible for photosynthesis found in the epipelagic zone (Benoit-Bird *et al.* 2001). Because rising sea surface temperatures and increases in ocean acidity affect primary producers, the availability of planktonic food for fish larvae may change, thus affecting the success of the fish populations (Walther *et al.* 2002) and ultimately the predators feeding upon them, including spinner dolphins. The metabolic function and, therefore, growth and reproduction of spinner dolphin prey species may be altered because an increase in CO_2 will affect the ability of blood to carry oxygen — one of the spinner dolphins' main prey items, squid, has high sensitivity to changes in CO_2 levels (Learmonth *et al.* 2006). Prey species of spinner dolphins may also respond directly to a rise in sea temperatures with changes in their distribution, abundance and composition. Many spinner dolphin prey species have limited thermal tolerances and can only survive within certain temperature ranges. These species would thus be affected if ocean temperatures change (Learmonth *et al.* 2006). Changes in temperature may also affect the different developmental stages and phenology — embryonic development, timing of spawning — of spinner dolphin prey species, leading to potential consequences for their survivability and abundance.

If climate change affects the abundance, distribution, and movement patterns of Hawaiian spinner dolphin prey species, spinner dolphins are likely to suffer resulting consequences. The fitness of spinner dolphins with reduced food supply will suffer due to lower energy reserves, which will affect their ability to locate and capture food, avoid predators due to decreased vigilance, and care for young effectively. As a result of decreased fitness and health, spinner dolphins may also have an increased risk of disease, starvation, and susceptibility to environmental contaminants (Learmonth *et al.* 2006).

Another potential consequence of climate change for Hawaiian spinner dolphins is an increase or shift in their geographic range. If ocean temperature continues to rise, the geographic range for spinner dolphins may change to follow their prey species or simply maintain a certain optimal environment for survival. Range shifts may increase the potential to encounter predators and competitors, which may affect their survival. In addition, a shift in range may result in an increased risk of the spread of viruses and the introduction of novel pathogens (Learmonth *et al.* 2006).

Hawaiian spinner dolphins are unlikely to be directly affected by a rise in sea levels, although their essential daytime habitat may be altered. Spinner dolphins utilize coves and bays with sandy bottoms, and shallow, calm waters. An increase in sea level may alter the physical parameters of these habitats. How these changes may affect spinner dolphins, whether positively or negatively, is currently unknown.

Climate change also has the potential to affect Hawaiian spinner dolphins' predators and competitors. The primary predators of spinner dolphins in Hawai‘i are sharks (Norris *et al.* 1994), but other cetacean species (killer whales) are also potential predators (Perrin 1998). Spinner dolphins primarily compete for resources with other species that feed on the mesopelagic boundary community. These predators and competitors may be affected by climate change directly or indirectly in ways that are currently unknown.

4.5.5.2 Impacts of the Alternatives on Climate Change

There are no anticipated measurable impacts on global climate change from any of the alternatives analyzed in this document. The preferred alternative proposes to implement approach restrictions and time-area closures of essential daytime habitats for Hawaiian spinner dolphins at five bays in the MHI. Although some spinner dolphin-based tour boat activities may be displaced to other locations as a result of the proposed time-area closures, it is likely that the majority of operators would not choose to travel farther than they currently are, due to the extra time and cost constraints on fuel and labor. It is also likely that most people who swim from shore to reach the dolphins would not decide to travel farther by vehicle to reach remote areas not affected by the time-area closures, as they would still be subject to the approach restrictions under the preferred alternative. Therefore, based on the project parameters, NMFS does not expect the action alternatives to have measurable impacts on climate change due to changes in vehicle or vessel usage. The nature of this project does not include any harmful impacts to the environment, and NMFS does not expect CO_2 and other greenhouse gas emissions to measurably increase due to the approach restrictions or time-area closure implementation.

In summary, although effects of climate change on Hawaiian spinner dolphins are possible, they are still uncertain and it is therefore not possible to determine at this time how these effects may be influenced by the various alternatives. The impacts of climate change have been concluded to be long-term processes that will manifest over a timescale that exceeds the scope of this project. Conversely, this project is not expected to have any measurable impact on climate change because the parameters of this project do not include any of the major threats thought to impact climate change.

Chapter 5 – Regulatory Impact Review

5.1 Introduction and Background

The RIR is developed, in part, to comply with the requirements of Executive Order (E.O.) 12866. The regulatory philosophy of E.O. 12866 is summarized in the following statement from the order:

Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, and public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

This RIR summarizes the effects of a preferred action and other alternative actions that NMFS considered to prohibit activities that disturb Hawaiian spinner dolphins during daytime resting, nurturing, and socializing. The MMPA and its implementing regulations prohibit forms of take including harassment and intentional disturbance of spinner dolphins and other marine mammals. NMFS PIRO has published and implemented the Marine Mammal Viewing Guidelines to assist vessel operators in learning about and adopting voluntary measures to view marine mammals in a minimally disruptive manner. Interactions between people and spinner dolphins continue to occur in near-shore waters despite prohibitions, guidelines, and outreach efforts currently in place, and are prevalent in essential daytime habitats that have been targeted for dolphin-directed activities. Disturbance occurs through vessel approach and individuals swimming in close proximity to dolphins, and often occurs within essential daytime habitats that provide an important role in supporting spinner dolphin behaviors. Therefore, PIRO is proposing action that limits this disturbance.

5.2 Description of the Alternatives Considered

Chapter 2 of the FEIS describes each management alternative in detail. The alternatives are as follows:

Alternative 1: No Action
Alternative 2: Swim-With Regulation
Alternative 3: Swim-With and Approach Regulations
Alternative 3(A): Swim-With and 50 yard Approach Regulations

Alternative 3(B): Swim-With and 100 yard Approach Regulations
Alternative 4: Mandatory Time-Area Closures and Swim-With and Approach Regulations
Alternative 5: Voluntary Time-Area Closures and Swim-With and Approach Regulations

The alternatives 2, 3, 4, and 5 are all applicable within 2 nm of each main Hawaiian Islands and in designated waters bounded by the islands of Lānaʻi, Maui, and Kahoʻolawe.

5.3 Benefits and Impacts of Management Alternatives

5.3.1 Description of Affected Parties and Types of Impacts

Alternatives vary in terms of which parties are affected. This section provides background on entities that are potentially affected by the preferred alternative as well as the non-preferred alternatives.

In recent years, a tourist-dependent industry involving direct human interaction with Hawaiian spinner dolphin groups (also referred to as "swimming with dolphins" operations) has emerged on four of the seven inhabited MHI: Kauaʻi, Oʻahu, Maui, and Hawaiʻi.

The businesses that will likely be most affected by the implementation of any of the action alternatives will be the whale and dolphin watching businesses, dolphin swim spiritual retreats, snorkel tours, SCUBA companies, and kayak tours/rentals, since they are the most dolphin-directed. Other ocean-recreation companies, such as jet ski, SUP, and outrigger companies, may also be affected because there is an opportunity to see dolphins while on these platforms, but they are less focused on the dolphins, so they will be affected to a lesser extent.

Most of the directly affected parties, particularly in the commercial sector, cater to the tourists visiting the MHI. 2018 had marked the seventh consecutive year of recent growth in visitor spending and visitor arrivals. Based on recent information from the Hawaiʻi Tourism Authority, 9.9 million people visited the State of Hawaiʻi in 2018: 9,761,448 by air and 127,397 by cruise ships (https://www.hawaiitourismauthority.org/media/4086/2018-annual-report-final-repost-1-7-20.pdf). By comparison, in 2013, approximately 8.2 million people visited the state of Hawaiʻi in 2013 by air or cruise ships: 8,003,474 by air, and 170,987 by cruise ships (Department of Business, Economic Development and Tourism – State of Hawaiʻi (2013)). More recently, beginning in March 2020, the Hawaii tourism industry has been undergoing a significant drop in travel and tourism-related business activities. However, since March 2020 the Hawaii tourism industry experienced a significant drop in travel and tourism-related business activities. In April 2020, a total of 4,564 visitors arrived in Hawaii, a 99.5% decrease from the number of visitors that arrived in April 2019 (https://www.hawaiitourismauthority.org/media/4635/april-2020-visitor-statistics-press-release-final.pdf). While tourism has increased in the state over the last year with 171,976 visitor arriving in Hawaii in January 2021, this number represents a 70% decline compared to January 2020 (https://www.hawaiitourismauthority.org/media/6832/january-2021-visitor-statistics-press-release-final-2.pdf). The tourism industry has faced immediate financial challenges and businesses that rely on tourism have been financially impacted from the COVID pandemic. Although it is not known when tourism will return to pre-COVID levels, we anticipate that that dolphin directed activities would resume to pre-shutdown levels in the future.

Much of the background information for potentially affected entities and analysis in this RIR is based on a 2007 report that summarized survey and other information collected in 2006 with regard to participants within these industries that potentially interact with Hawaiian spinner dolphins to varying degrees in the MHI (Impact Assessment, Inc. 2007) as well as an updated report finalized in 2018 with new information collected in 2017 (Impact Assessment, Inc. 2018). To learn more about the dolphin-tour industry, the authors sought to identify as many of the dolphin-tour companies as possible through informal contact. The report developed an estimate of the number of businesses involved with dolphin tourism by reviewing archival materials and asking business owners and operators to identify tours that typically encounter dolphins. NOAA has also maintained an ongoing list of companies that potentially enable interaction with spinner dolphins to some degree. In the time between when the 2007 Economic Data Report came out and the updated data was collected in 2017, there has been an overall gain in the number of swim-with-dolphin tour companies. For example, the number of businesses on Hawai‘i Island that facilitate close underwater encounters with dolphins has increased from 6 to 47, and the number of dolphin-focused spiritual retreats facilitating close underwater encounters also increased from 5 to 47. This increase includes some companies whose primary activity was not dolphin-directed in the past, such as SCUBA companies, but have added swimming with or watching dolphins to their current menu of activities offered.

With respect to demand for activities potentially involving some degree of interaction with Hawaiian spinner dolphins, a study estimated what consumers were willing to pay for boat trips with varying attributes such as swimming with dolphins, wildlife viewing and snorkeling with dolphins (Hu et al. 2009). The authors developed these estimates through surveys administered on the island of O‘ahu, near harbors suitable for dispatching excursion boats. They found that respondents generally prefer swimming and diving with spinner dolphins to viewing the dolphins from a boat. The increase in fees that people were willing to pay to swim with dolphins instead of just viewing dolphins from a boat varied depending on a wide range of factors, such as respondent’s demographic information (for example, age and state residency) or vessel-based characteristics (for example, vessel size or whether the tour operator offered a guarantee to see at least one dolphin) offered along with the activity. These results suggest that many consumers typically would be willing to pay a premium to interact closely with dolphins in the water.

The information provided in the 2018 Economic Data Report will provide the basis for the description of the industries. The parties potentially affected by some or all of the action alternatives are as follows:

Swim-with-wild-dolphins tour operators (including spiritual retreats and dolphin-oriented swim/snorkel tours)

Swim-with-wild-dolphin tour operators are those that bring clientele within close proximity to Hawaiian spinner dolphins. These include dolphin-oriented swim/snorkel tours as well as spiritual retreat operations.

Swim-with-wild-dolphin tour operators include generalized commercial boat tours that advertise the intent to enable clientele to swim in close proximity with Hawaiian spinner dolphins. Boats

transport passengers toward spinner dolphins, including in essential daytime habitats. Operators provide facemasks, fins and snorkels to enhance viewing abilities. In addition to dolphin viewing, almost all Kona Coast (Hawaii Island) tour companies also provide night-time manta-ray viewing, afternoon reef snorkeling, winter whale watching, and/or scuba diving. Tour companies in Kona use a range of vessels including rigid inflatables, single-hulled motorized vessels ranging from 23-45 ft length overall, motorized catamarans; and motorized sail catamarans. As for Oahu, the fleet that provides underwater dolphin encounters along the Leeward Coast includes rigid inflatable vessels (from ~35 to 45 feet length overall) and single and double deck catamarans. Tour companies exhibit varying degrees of operational diversity, including whale watching, sunset tours, and snorkel tours, and all provide transportation to and from Waikiki and/or Ko'olina.

There are many businesses, most of which operate on the island of Hawai'i, that offer spiritual retreats enabling customers to swim with wild dolphins. These businesses provide opportunities for persons wishing to interact with Hawaiian spinner dolphins for physical, mental, and/or spiritual well-being enhancement. To that end, the intent of these operations is to provide close interaction between people and dolphins. Spiritually linked tour operations may charter vessels through other established dolphin-swim companies to transport customers as part of an overall per person package consisting of lodging, swimming with dolphins, and other activities. It appears that these chartered trips are folded into the daily trip schedule, rather than as an additional trip (Laura McCue, NMFS PIRO PRD, personal communication, January 2015). In many cases, the spiritual tours offer yoga, meditation, whale watching, and other forms of relaxation, in addition to swimming with dolphins.

According to Impact Assessment, Inc. (2018), there were an estimated six to eight locally owned spiritual retreat businesses and at least 33 non-local (i.e., mainland U.S., Europe, Japan, South Africa, and Australia) spiritual retreat businesses on Hawai'i Island that reportedly provided direct Hawaiian spinner dolphin interaction in 2017. No numbers were provided for those businesses operating on O'ahu, Maui, and Kaua'i. The report also reported roughly 41 tour operators on Hawai'i and seven on O'ahu that enabled direct interactions with spinner dolphins (numbers for Maui were not provided and this activity did not seem to occur on Kaua'i). The 2018 report also indicated that commercial boat tour operations on Maui do not appear to advertise underwater encounters with spinner dolphins, but unplanned or unintentional encounters may occur. Kauai tour companies marketed the possibility of seeing dolphins, but did not appear to facilitate encounters with dolphins.

Dolphin-watch tour operators

Dolphin-watch tours involve taking clients out to specifically view wild dolphins, compared with the generalized wildlife viewing tour boats described below, which offer other activities and are not dolphin-focused. The 2007 and 2018 Economic Data Reports did not report any information on this specific industry, which may have been included or captured in other categories listed in the report.

Generalized commercial boat tour operators

More generalized commercial boat tours offer a range of ocean activities, which may include sightseeing, snorkeling, diving, viewing various forms of sea life from a vantage point in and/or above the water, or just generally spending time on the ocean. Operators of these vessels may charge either a fee per head or a charter fee for the use of the vessel. The majority of the general tour boats derive revenue from whale-watching and sightseeing operations, while a number of the dive/snorkel vessels offer snorkeling or diving trips. As mentioned earlier, these boat tours do not specialize in viewing or interacting with dolphins, although they might approach closer to dolphins if the opportunity unexpectedly arises.

The 2007 Economic Data Report (Impact Assessment, Inc.) estimated that there were nine generalized commercial boat tour businesses reportedly involving indirect dolphin interaction operating on Hawai‘i Island, 20 on Maui, 28 on O‘ahu, and 11 on Kaua‘i. The 2018 Economic Data Report did not provide an assessment of the overall number of generalized commercial boat tour businesses on Hawai‘i Island, O‘ahu, Kaua‘i, or Maui, the report did provide economic or operational information from 38 generalized commercial boat tour businesses (Hawai‘i Island: 5, O‘ahu: 2, Maui: 16, and Kaua‘i: 15).

Tour vessels that offer more generalized wildlife viewing, rather than focusing on interacting closely with Hawaiian spinner dolphins, tend to be larger than vessels used by swim-with-dolphin tour operators. Based on the 2007 Economic Data Report, these might range between 27 and 130 feet in length, with a maximum capacity ranging between 25 and 400 people. The 2018 did not report vessel capacity information for this category.

In addition to the business categories described above, other parties that may be affected by the rulemaking and/or the non-preferred action alternatives include those below.

Non-motorized vessel tour operators

Numerous kayak tour businesses around the MHI provide recreational, sightseeing, and a general wildlife viewing experience. The 2018 report did not explore the extent of dolphin interactions among kayakers, but did indicate that kayak business owners had reported discouraging kayakers from engaging with dolphins. NMFS estimated that in 2015, the numbers of companies that either operate kayak tours or rent out kayaks to be as follows: Hawai‘i (6), Maui (9), O‘ahu (6), and Kaua‘i (13).

Operators of commercial vessels used for purposes other than wildlife tourism

Examples include commercial fishing vessels, charter fishing boats, barges and cruise ships.

Rental companies (boat, watercraft, and equipment)

This includes businesses in all locations that rent out boats and personal watercraft, as well as those that rent out non-motorized ocean recreational equipment, such as kayaks, SUPs, and surfboards. These businesses take the form of beach concession stands, surf schools, kayak shops, and dive shops. NMFS does not have approximate numbers for these businesses.

Non-commercial ocean users

This category includes kayakers, private boaters/personal watercraft users, stand-up paddle boarders, surfers, and swimmers.

5.3.2 Economic Benefits

Under current conditions, Hawaiian spinner dolphins suffer frequent disturbances from vessels and swimmers seeking interactions with wild dolphins (Forest 2001, Östman-Lind 2004, Danil et al. 2005, Courbis 2007, Timmel et al. 2008, Milette et al. 2011). Each action alternative has some potential to prevent or reduce the threat of take occurring (including harassment and disturbance), though the magnitude of the reduction will vary based on type and number of activities that the measure is capable of addressing. NMFS anticipates that a reduction in disturbance will have a positive impact on the spinner dolphins, and help increase their population-level fitness over time.

The economic benefits of enhancing protections for Hawaiian spinner dolphins in their natural habitat include the value associated with the non-consumptive use, such as watching dolphins from boats, kayaks, and the shore. Some of the action alternatives would reduce the non-consumptive "use" value from the group of people who wish to interact closely with dolphins by swimming or approaching dolphins closely; however, for the many more who participate in more general wildlife viewing, which could occur from greater distance, this value could be enhanced by greater potential for encountering dolphin groups on a tour, albeit at a greater distance. Taking measures to enhance spinner dolphin populations also provides other non-market economic benefits, such as option value (value gained if people would like to be able to view dolphins in the future), bequest value (value of being able to protect spinner dolphin populations as a resource for future generations) and existence value (value people gain from simply knowing that spinner dolphins exists, even if they never intend to visit Hawai‘i to view dolphins).

As no estimated economic non-market values have been quantified in the context of enhancing protections for Hawaiian spinner dolphin populations through these various action alternatives, it is not possible to quantify the total value of economic benefit from taking any of the action alternatives. However, most of the action alternatives would provide economic benefits due to enhanced protections for spinner dolphins that would accrue to Hawai‘i residents and to citizens throughout the U.S.

5.3.3 Economic Impacts of Each of the Alternatives

NMFS assesses the potential economic impacts for each of the alternatives qualitatively and quantitatively NMFS believes each of the action alternatives provides some degree of benefit to the MHI spinner dolphin populations, since the reduction in disturbance to the dolphins is thought to support the long-term sustainability of this species. As disturbance declines, spinner dolphin populations should increase due to increased fecundity and survival to reproductive age.

Alternative 1: "No Action" Alternative

The No Action Alternative would likely allow the current — and potentially increasing — frequency and intensity of human interactions with Hawaiian spinner dolphins to continue. Wildlife viewing and interactive wildlife excursions, including spinner dolphin-related tourism, have become increasingly popular in recent years (Hoyt 2001, Boehle 2007, OConnor et al. 2009, Hu et al. 2009). Furthermore, based on the estimated numbers of businesses facilitating underwater interactions with dolphins in the 2008 economic report and the 2017 report, the number of business engaged in this activity has increased dramatically. This suggests that the increase in the number of companies offering dolphin-directed tours is likely to continue and the existing companies that remain may expand the number of daily trips. If disturbance to spinner dolphins continues unabated, impacts to the resident spinner dolphin population are anticipated to occur either in the form of habitat displacement and/or eventual declines in the dolphin population levels. Gradual declines to spinner dolphin numbers or habitat abandonment could, in turn, affect the ability of tour operators and spinner dolphin-directed recreational boaters or swimmers to locate dolphins, both in known spinner dolphin essential daytime habitat and in open waters outside of those areas. For example, those people who are engaged in spinner dolphin-directed activities may need to travel farther or engage in those activities in areas where travel conditions are less than optimal for recreational passengers because of, for instance, choppy water. For tour operators, this could result in increased travel time, higher fuel costs and reduced client satisfaction, which may ultimately compromise business abilities at the margin.

Alternative 2: Swim-With Regulation

Compared with the No Action Alternative, prohibiting people from swimming with Hawaiian spinner dolphins is likely to have positive benefits to spinner dolphin individuals and the larger population. While Alternative 2 is expected to alleviate some of the disturbance considered to threaten long-term health of resident populations, it is uncertain to what degree the elimination of this one activity will enhance protections for spinner dolphins that still may face impacts from other activities, such as close approach by vessels. Resident populations may remain at risk if these other factors are not adequately addressed.

Under Alternative 2, Hawaiian spinner dolphin-directed swimming activities would be prohibited both from shore and from vessels. NMFS does not expect this alternative to directly affect other activities that are unrelated to swimming with spinner dolphins, although it may indirectly affect them.

The potential direct impacts to various parties are described below:

Swim-with-wild-dolphins tour operators (including spiritual retreats and shore-based tours)
The prohibition on swim with Hawaiian spinner dolphin activities would eliminate virtually all commercial swim-with-wild-dolphin activities. If dolphins approach swimmers and snorkelers who enter the water, these swimmers will need to reopen the space between themselves and the dolphins by moving away. Therefore, implementing this alternative would lead to operators that currently offer the opportunity to swim with wild dolphins to cease this particular activity, though they may choose to continue to provide other services among their menu of options to their clientele. For example, a spiritual retreat may continue to provide yoga and meditation;

swim-with-wild-dolphins tour operators may choose to transition to operate as strictly a dolphin-watch tour operation; generalized tour vessel operation, or operators of either of these swim-with-wild-dolphin business categories, may choose to transition to activities that involve swimming with other marine wildlife. For these businesses, eliminating the option to swim with wild dolphins may result in a reduction in revenue, which could come from the reduction in the number of customers (specifically those who sought the experience of swimming with wild dolphins), as well as possible reduced trip or package prices with the reduced menu of options available for each trip. The loss in overall revenue to the swim-with-wild-dolphins operators is uncertain. Alternative 2 may also result in some businesses going out of businesses, seeing devaluation of business assets, and employee layoffs. Businesses that convert swim-with-dolphins experiences to other ocean-immersive experiences such as reef snorkeling could result in increased competition and crowding in popular locations. Along the Kona Coast of Hawii Island, tours that offer in-water dolphin encounters range in price from $99 to $216, tours that offer reef snorkeling and dolphin vieiwing from beyond 50 yards range in price from $106 to $139; on Oahu tours that offer in-water dolphin encounters range in price from $109 to $156 while vessel based dolphin tours cost between $66 to $225 (Impact Assessment Inc. 2018).

Dolphin-watch tour operators, generalized commercial boat tour operators and non-motorized vessel tour operators

Alternative 2 does not prohibit close approach by vessels. As a result, Hawaiian spinner dolphin-directed tour operators may gain customers by offering an up-close viewing opportunity on a vessel or other watercraft. Furthermore, the conservation of spinner dolphins gained through Alternative 2 may maintain the ability of generalized tour operators to find spinner dolphins, especially if the level and types of close interactions between these vessels and spinner dolphins remains about the same. On the other hand, if businesses that had been offering swim-with-dolphins experiences transition to vessel-based wildlife viewing operator, this would increase business competition and crowding in popular locations, which would adversely affect revenues and costs.

Non-commercial ocean users

Non-commercial ocean users, such as swimmers, scuba divers, and snorkelers, would all be restricted from swimming with Hawaiian spinner dolphins. Most swimmers, snorkelers, and scuba divers may be largely unaffected by this prohibition. For those swimmers who seek a spiritual or healing experience from closely interacting with spinner dolphins, they would no longer be able to do so, but may choose to view dolphins from a kayak or vessel and/or from a greater distance.

Indirect impacts

Lodging, airlines, restaurants, car rentals or other industries that provide services to visitors that participate in swim-with dolphin activities may be adversely affected, depending on the extent to which they depend on the businesses that enable dolphin-swim activities. Many of these businesses serve a large number of visitors to the state seeking a wide range of experiences and have a wide customer base. Generalized commercial boat tour operators or other businesses that incidentally interact with spinner dolphins, may also be adversely affected indirectly with increased competition and crowding in specific locations, if some swim-with-dolphin operators transition to more generalized wildlife viewing.

Alternative 3(A): Swim-With and 50 Yard Approach Regulations

For the most part, the Hawaiian spinner dolphin-viewing tour industry may see a long-term economic benefit that comes through protecting the resource on which the spinner dolphin-focused tourism industry depends, relative to the No Action Alternative. However, operators that enable direct interaction with wild spinner dolphins through spiritual retreats or advertise the opportunity to swim or interact directly with wild spinner dolphins, or view them up close by any means, would be adversely affected by the implementation of the preferred alternative, since this alternative prohibits activities that are conducted in close proximity to wild dolphins.

NMFS anticipates Alternative 3(A) to directly affect a wide variety of activities because it prohibits all people and vessels from approaching Hawaiian spinner dolphins. Section 2.4.1 of the FEIS identifies a few exceptions to the 50 yard prohibition. The economic impacts to the various affected parties are as follows:

Swim-with-wild-dolphins tour operators (including spiritual retreats and shore-based tours)
The 50 yard approach limit would eliminate virtually all commercial swim-with-wild-dolphin activity, and if swimmers and snorkelers find themselves within 50 yards of spinner dolphins, they would need to reopen the space between themselves and the dolphins by moving away. Implementing this alternative would require operators that currently offer the opportunity to swim with wild dolphins to cease this activity, although they may choose to continue to provide other services among their menu of options to their clientele. For example, a spiritual retreat may continue to provide yoga and meditation, or swim-with-wild-dolphins tour operators may choose to transition to operate as strictly a generalized tour vessel operation. For these businesses, eliminating the option to swim with wild dolphins is likely to result in a reduction in revenue. The revenue drop could come from the reduction in the number of customers, specifically those who specifically sought the experience of swimming with wild dolphins, as well as reduced trip or package prices with the reduced menu of options available for each trip. The loss in overall revenue to the swim-with-wild-dolphins operators is uncertain. Alternative 3(A) may also result in some businesses going out of businesses, seeing devaluation of business assets, and employee layoffs. Businesses that convert swim-with-dolphins experiences to other ocean-immersive experiences such as reef snorkeling could result in increased competition and crowding in popular locations, and likely to a greater extent than for Alternative 2.

Swim-with-wild-dolphin tour operators who choose to transition to generalized commercial boat tour operators would still face impacts as described under the industry of generalized commercial boat tour operators. Information is not available about how their operating costs would change if they were to transition to generalized commercial boat tour.

Dolphin-watch tour operators generalized commercial boat tour operators and non-motorized vessel tour operators
Commercial boat tour operators would no longer be able to take customers to view Hawaiian spinner dolphins within 50 yards. Removing this viewing option may reduce demand for vessel-based tours among customers who specifically hope to see the dolphins from a vessel at closer range particularly dolphin-watch tours that advertise close-viewing opportunities. Some tour

operators may be able to offer alternative recreational opportunities as part of a tour to help offset the loss in demand for tours. In addition, their revenues and business operations would be adversely affected if businesses that had formerly offered swim-with-dolphin experiences transition to vessel-based wildlife viewing business.

Operators of commercial vessels used for purposes other than wildlife tourism personal watercraft and private boats
All boats and personal watercraft would be restricted from approaching within 50 yards of Hawaiian spinner dolphins, possibly resulting in a slight increase in travel time, which might cause a slight increase in operating costs.

Personal watercraft users and private boaters are less likely to be engaging in their water-based activity daily. Although Alternative 3(A) may increase private watercraft users' operating costs, these costs are not likely to increase by a substantial amount over the course of the year.

Rental companies (boat, watercraft, and equipment)
All persons would be restricted from approaching Hawaiian spinner dolphins within 50 yards by any means. Rental companies that rent out charter boats or recreational equipment, such as watercraft, kayaks, surfboards, and SUPs, and that currently attract customers who wish to interact with spinner dolphins, will no longer be able to promote this activity. As a result, these rental companies may see a drop in demand for rentals from those customers who are renting solely to interact closely with dolphins, resulting in a decrease in revenue.

Non-commercial ocean users
Non-commercial ocean users, such as swimmers, scuba divers, snorkelers, surfers, and stand-up paddleboarders, would all be restricted from deliberately approaching Hawaiian spinner dolphins or remaining within 50 yards by any means. This will reduce the quality of ocean experience for those persons who specifically seek to engage in those activities.

Indirect impacts
Lodging, airlines, restaurants, car rentals or other industries that provide services to visitors that participate in swim-with dolphin activities may be adversely affected, depending on the extent to which they depend on the businesses that enable dolphin-swim activities. Many of these businesses serve a large number of visitors to the state seeking a wide range of experiences and have a wide customer base. Generalized commercial boat tour operators may also be adversely affected indirectly, if some swim-with-dolphin or dolphin-watch tour operators transition to more generalized wildlife viewing.

Alternative 3(B): Swim-With and 100 Yard Approach Regulations

The types of impacts to all affected entities in implementing Alternative 3(B) would be similar to those that would results as a result of implementing the 50 yard approach rule (Alternative 3(A)). But the impacts are expected to be more severe under Alternative 3(B), with potentially greater loss in customers and revenue, particular for businesses whose revenues depend to any extent on opportunity to view dolphins from close and somewhat close (between 50 and 100 yards) range. Alhtouhg this alternative may have a greater conservation benefit to spinner dolphin populations

than a distance buffer that is less than 100 yards, not all approaches witin 100 yards will result in take.

Alternative 4 (Final Action): Mandatory Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 4 combines the restrictions associated with an approach rule (see Alternative 3) and calls for implementing time-area closures in the following five identified Hawaiian spinner dolphin essential daytime habitats: Makako Bay, Kealakekua Bay, Hōnaunau Bay, and Kauhakō Bay on Hawai‘i Island and La Perouse Bay on Maui. The minimum prescribed distance under consideration is between 50 and 100 yards. Alternative 4 would be the most restrictive in terms of impacts to directly affected parties, including swim-with-wild dolphins tour operators, generalized wildlife tour operators, non-motorized vessel tour operators, and other commercial and non-commercial ocean users, particularly if the minimum distance is set at 100 yards. Alternative 4 would restrict all activities associated with close approach to Hawaiian spinner dolphins, including swimming and close approach by vessel, as well as create time-area closures in five Hawaiian spinner dolphin essential daytime habitats. Sections 2.4.1 and 2.7.3 identify exceptions to the general prohibition on close approach and entry into the time-area closures.

For the most part, the wildlife-viewing tour industry may see a long-term economic benefit that results from protecting the resource on which the Hawaiian spinner dolphin-focused tourism industry depends relative to the No Action Alternative and the other action alternatives. However, operators that enable direct interaction with spinner dolphins through spiritual retreats or advertise the opportunity to swim or interact directly with spinner dolphins or view dolphins up close by any means would be adversely affected, since these activities that are purposefully conducted in close proximity to wild spinner dolphins would cease under this alternative. In addition to the requirement to view spinner dolphins from a distance of 50 yards, viewing of spinner dolphins at the time-area closure site would be required to occur outside of the designated boundaries of the time-area closures during the time period that these sites are closed (6 AM – 3 PM).

NMFS anticipates Alternative 4 to directly affect a wide variety of activities because it prohibits all people and vessels from approaching Hawaiian spinner dolphins and entering the time-area closures between 6 AM and 3 PM. The economic impacts to the various affected parties are as follows:

Swim-with-wild-dolphins tour operators (including spiritual retreats and shore-based tours) Alternative 4 would eliminate virtually all commercial swim-with-wild-dolphin activity, through the prohibition of swimming with Hawaiian spinner dolphins or approaching them within the minimum prescribed distance. If spinner dolphins approach swimmers and snorkelers who enter the water, these swimmers will need to reopen the space between themselves and the dolphins by moving away. Therefore, implementing this alternative would lead to operators that currently offer the opportunity to swim with spinner dolphins to cease this activity, although they may choose to continue to provide other services among their menu of options to their clientele. For example, swim-with-wild-dolphins tour operators may choose to transition to operate as strictly a generalized tour vessel operation or a spiritual retreat may continue to provide yoga and

meditation. For these businesses, eliminating the option to swim with spinner dolphins is likely to result in a reduction in revenue. The revenue drop could come from the reduction in the number of customers, specifically those who sought the experience of swimming with spinner dolphins, as well as reduced trip or package prices with the reduced menu of options available for each trip. The loss in overall revenue to the swim-with-wild-dolphins operators is uncertain. It is also likely that some of these swim-with-dolphin businesses will go out of business, see devaluation of business assets, and/or lay off employees. These adverse impacts are likely to be more extensive compared to all other action alternatives.

Swim-with-wild-dolphin tour operators who choose to transition to generalized commercial boat tour operators would still face impacts as described under the industry of generalized commercial boat tour operators. NMFS cannot determine how their operating costs would change if they were to transition to generalized commercial boat tour operations.

Dolphin-watch tour operators, generalized commercial boat tour operators and non-motorized vessel tour operators
Commercial boat tour operators would no longer be able to take customers to view Hawaiian spinner dolphins from within the minimum prescribed distance. Removing the option of approaching within the minimum prescribed distance to spinner dolphins may reduce demand for vessel-based tours among customers who specifically hope to view the dolphins from a vessel at closer range. Some tour operators may be able to offer alternative recreational opportunities as part of a tour to help offset the loss in demand for tours.

In addition, boats would not be allowed to use the time-area closures during the specified times (for exceptions see section 2.7.3). Generalized commercial boat tour operators may still view Hawaiian spinner dolphins from outside the closed areas and from at least the minimum prescribed distance.

Dive tours operating at Makako Bay will face some adverse economic impact from the implementation of the time-area closure. The closure at Makako Bay would eliminate the use of the inner bay dive mooring during the closure period of 6 AM until 3 PM, but would still allow use of dive moorings that are on the north and south ends of the bay. The elimination of the daytime use of the inner bay mooring would require those companies offering dives at that location to find suitable alternatives, possibly increasing operating expenses to reach the alternative location and/or loss in revenues from loss in customers who specifically seek to dive in Makako Bay. The inner bay dive mooring can still be used for nighttime manta ray dives after the closure period ends.

No person would be allowed to use the time-area closures during the specified times unless covered under the exceptions listed in section 2.7.2 of the FEIS. There is the possibility that boaters will be subject to this restriction even when spinner dolphins are not present; i.e., when there is no possibility of take occurring. Those individuals or companies that conduct kayak tours or other non-motorized vessel tours in or near time-area closures, and promote the opportunity of close interactions with Hawaiian spinner dolphins within the time-area closures would have to scale back on their promotion of these activities. These particular operators may see a reduction in revenues as a result compared to the no action alternative. Kayak tour companies that operate

near bays with closed areas are expected to continue their operations with minimal modifications, as the closed areas are generally designed to allow other uses, including kayaking, at each of the bays. For instance, the closure in Kealakekua Bay has been designed so that the popular route used by kayakers to the Captain Cook Monument from Nāpōʻopoʻo Pier would be unaffected.

Operators of commercial vessels used for purposes other than wildlife tourism; personal watercraft and private boats; non-commercial ocean users
All boats and personal watercraft would be restricted from approaching within the minimum prescribed distance of Hawaiian spinner dolphins. This could result in a slight increase in travel time, which might cause a slight increase in operating costs for boats.

Personal watercraft users and private boaters are less likely to be engaging in their water based activity daily, so Alternative 4 is not likely to increase travel time by a substantial amount over the course of the year.

All boats must detour around the time-area closures during specified times; however, as the closed areas are fairly small and/or not along boat traffic routes, this is not likely to affect most boat traffic patterns.

Non-commercial ocean users, such as swimmers, scuba divers, snorkelers, surfers and stand-up paddleboarders, would all be restricted from deliberately approaching or remaining within 50 yards of Hawaiian spinner dolphins. This will reduce the quality of ocean experience for those persons who specifically seek to engage in those activities. Additionally, no person would be allowed to use the closure areas by any means during the specified times. However, the closure areas at each of the five bays have generally been designed so that the bays can continue to accommodate various user groups. For instance, in La Perouse Bay, the inner shoreline of the bay would remain open for uses such as swimming and surfing. In Hōnaunau Bay, the boat ramp and Two Step would remain open.

Rental companies (boat, watercraft, and equipment)
All persons would be restricted from approaching Hawaiian spinner dolphins within the minimum prescribed distance by any means. Rental companies that rent out charter boats or recreational equipment, such as watercraft, kayaks, surfboards, and SUPs, and that also currently attract customers by advertising or promoting their rentals by encouraging the capability of directly interacting with spinner dolphins, will no longer be able to promote this activity. As a result, these rental companies may see a drop in demand for rentals from those customers who are renting solely to interact closely with the dolphins, resulting in a decrease in revenue.

Customers can still use rental equipment within those bays, as the closed areas have been designed to allow user groups ample space to engage in activities outside the closed areas. The time-area closures should not affect this demand among renters who do not intend to encounter closely with Hawaiian spinner dolphins.

Indirect impacts

Lodging, airlines, restaurants, car rentals or other industries that provide services to visitors that participate in swim-with dolphin activities may be adversely affected, depending on the extent to which they depend on the businesses that enable dolphin-swim activities. Many of these businesses serve a large number of visitors to the state seeking a wide range of experiences and have a wide customer base. Generalized commercial boat tour operators may also be adversely affected indirectly, if some swim-with-dolphin or dolphin-watch tour operators transition to more generalized wildlife viewing.

Alternative 5: Voluntary Time-Area Closures in Five Selected Essential Daytime Habitats and Swim-With and Approach Regulations

Alternative 5 is similar to Alternative 4, except that the requirement to stay outside of the time-area closures would be voluntary under Alternative 5. The minimum prescribed distance under consideration is between 50 and 100 yards, as was the case for Alternative 4. If no one were to comply with the voluntary time-area closures, the impacts to all entities would be the same as those described under Alternative 3(A) when the minimum distance for approach is set at 50 yards. Under the same scenario of no compliance to voluntary time-area closures, when the minimum distance for approach is set at 100 yards, then the impacts would be the same as if Alternative 3(B) were to be implemented. If all entities were to comply with restrictions set by the time-area closure, then impacts would be the same as under Alternative 4. Most likely the impacts would be somewhere in between, as NMFS expects some would comply with the voluntary restrictions, but not all (and expected compliance rate is unknown).

5.3.4 Distributional Changes in Net Benefits

NMFS expects the preferred alternative (Alternative 3A) to primarily adversely affect businesses whose revenues rely on interacting with Hawaiian spinner dolphins in close proximity or individuals who ordinarily would choose to interact closely with spinner dolphins, especially those within areas that would be subject to time-area closures. With an indeterminate change in operating costs (if these firms do remain operating), spiritual retreats and dolphin swim tour companies, as well as those that conduct spinner dolphin-viewing from close proximity, will likely see a greater adverse impact on net revenues, compared with generalized commercial tour operators. Other adverse impacts to business that facilitate dolphin-swim and close viewing activities are likely to include increased operating costs from travelling further to find dolphin pods, reduced overall profitability, devaluation of such business assets as boats and permits, increased difficulty in planning future operations, reduction in staff hours, or employee layoffs. A proportion of companies, particularly those relying on swimming with dolphins as a major source of revenue in locations subject to the time-area closures, may go out of business as a result of implementing Alternative 4.

5.3.5 Changes in Income and Employment

NMFS expects the preferred alternative to have negative impacts on the income and regional employment for those in the tourism sector who enable swimming with or close interaction with Hawaiian spinner dolphins, particularly those that focus dolphin interaction activities in locations subject to time-area closures. Some of these businesses are likely to reduce employee hours and lay off employees, or even lose all of their employees if the company goes out of business. Alternative 4 may have a greater adverse impact on income and employment than the other

action alternatives, aside from the two sub alternatives with the 100 yard approach limit, because the time-area closures would impose restrictions on approaching spinner dophins within the closure sites and may result in buffer distances that are greater than 50 yards.

5.3.6 Impacts to Government

NMFS expects the preferred alternative to incur incremental impacts to the Federal government in terms of costs and staff resources relative to the no action alternative. Materials related to public outreach with regard to the rule once it is implemented, and training of local enforcement officers, may also require additional money, staff time and resources. Alternative 4 would incur costs associated with establishing and maintaining the markers for the closed areas as well as creating additional signage at each site.

5.4 Summary of the Significance Criteria

E.O. 12866 requires that the Office of Management and Budget review regulatory programs that are considered to be "significant." The RIR also serves as a basis for determining whether a regulatory action is a "significant regulatory action" under the criteria provided in E.O. 12866. A "significant regulatory action" is one that is likely to:

Have an annual effect on the economy of $100 million or more, or adversely affect, in a material way, the economy or a sector of the economy; productivity; competition; jobs; the environment; public health or safety; or State, local or tribal governments or communities
Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency
Materially alter the budgetary impact of entitlements, grants, user fees or loan programs, or the rights and obligations of recipients thereof
Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this E.O.

A regulatory program is "economically significant" if it is likely to result in any of the effects described above. In part, the RIR is designed to provide information to determine whether the regulation is likely to be economically significant. NMFS does not believe that the impact from implementing the preferred alternative would exceed $100 million per year, or adversely affect the economy or sector of the economy in any material way.

Chapter 6 - Other Applicable Laws

6.1 Federal Laws Applicable to this Action

The following sections describe the Federal laws that are applicable to the proposed action and alternatives. The proposed action or alternatives may require these permits and/or authorizations:

- Section 10 Permit (under the Rivers and Harbors Act) obtained from the Army Corps of Engineers.

- Permit from the US Coast Guard to install and maintain buoys at time-area closure sites.

6.1.1 National Environmental Policy Act

NEPA (42 U.S.C 4321 *et seq*.) requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. NEPA is applicable to "major" Federal actions affecting the quality of the human environment. A major Federal action is an activity that is fully or partially funded, regulated, conducted or approved by a Federal agency. NMFS is considering the environmental impacts of the proposed Federal action and reasonable alternatives under NEPA in this FEIS. NMFS prepared a Draft EIS that was noticed with request for public comments in the Federal Register on August 24, 2016 (81 FR 57854).

6.1.2 Marine Mammal Protection Act

The MMPA prohibits "taking" of marine mammals (16 U.S.C. § 1372). The MMPA defines "take" (or taking) as meaning, "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal," (16 U.S.C. § 1362(13)). The term "harassment" is defined as "any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A Harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B Harassment]" (16 U.S.C. § 1362(18)).

The MMPA confers the responsibility to the Secretary of Commerce to prescribe regulatory measures deemed "necessary and appropriate" to carry out the purposes of the MMPA," including preventing against take. *See* 16 U.S.C. § 1382.

Alternative 3(A) (Preferred) is consistent with the MMPA and would establish regulatory measures that NMFS expects will enhance protections for Hawaiian spinner dolphins from dolphin-directed activities that harass and/or disturb spinner dolphins during important daytime activities.

6.1.3 Endangered Species Act

The ESA (16 U.S.C. § 1531 *et seq*.) was established to conserve and protect threatened and endangered species. It is the policy of the ESA that all federal agencies must seek to conserve threatened and endangered species and use their authorities to further the purposes of the ESA. Section 7 of the ESA requires federal agencies to ensure that their actions do not jeopardize the continued existence of any species listed as threatened or endangered or result in the destruction or adverse modification of the critical habitat of listed species. The ESA requires the "action" agency to consult with the applicable Service agency to evaluate the effects a proposed agency action may have on a listed species. If the action agency determines through preparation of a biological assessment or informal consultation that the Preferred Alternative is "not likely to adversely affect" listed species or critical habitat, formal consultation is not required as long as the Service agency concurs. If, however, the action agency determines that the proposed action may affect listed species or critical habitat, formal consultation will be required. 50 C.F.R. § 402.

Pursuant to ESA section 7(a)(2), NMFS has determined that the preferred alternative will have no effect on ESA listed species.

6.1.4 National Historic Preservation Act

The goal of the NHPA (16 U.S.C. 470 *et seq*.) is to have federal agencies act as responsible stewards of our nation's resources when their actions affect historic properties. The NHPA established the Advisory Council on Historic Preservation (ACHP), an independent federal agency that promotes the preservation, enhancement, and productive use of our nation's historic resources and advise the President and Congress on national historic preservation policy. Section 106 of the NHPA requires Federal agencies to take into account the effects of undertakings they carry out, assist, fund, or permit on historic properties. Federal agencies meet this requirement by completing the section 106 process set forth in the implementing regulations, "Protection of Historic Properties," 36 C.F.R Part 800. The goal of the section 106 process is to identify and consider historic properties (or sites eligible for listing) that might be affected by an undertaking and to attempt to resolve any adverse effects through consultation. The process provides for participation by the State Historic Preservation Officer, Tribal Historic Preservation Officer, tribal, state and local governments, Indian tribes and Native Hawaiian organizations, applicants for Federal assistance, permits, or licenses, representative from interested organizations, private citizens and the public. Federal agencies and consulting parties strive to reach agreement on measures to avoid, minimize, and mitigate adverse effects on historic properties and to find a balance between project goals and preservation objectives.

Under the NHPA an "effect" means an alteration to the characteristics of a historic property qualifying it for inclusion or eligibility for the National Register.

NMFS conducted a scoping process to determine if historic properties may be affected by the proposed regulations. Native Hawaiian organizations, communities, and individuals were contacted upon recommendation from Hawai‘i's State Historic Preservation Division and four community scoping meetings were held in 2012 with those who expressed interest in the proposed undertaking. Following these scoping meetings (in 2013), NMFS employed a consultant to conduct interviews with three lineal descendants from each of the five bays identified for potential time-area closures to assist in providing additional information about historic properties or practices that may be affected by proposed actions (Honua Consulting 2013). NMFS has not received any information to suggest that the proposed undertaking would adversely affect historic properties or hinder cultural practices within historic properties such as those identified through the interviews with lineal descendants (*e.g*., fishing, canoe activities, ancestral caretaking and worship, and care of burial sites).\

NMFS has determined the swim-with and approach regulations for Hawaiian spinner dolphins do not have the potential to cause effects on or alterations to the characteristics of historic properties. The effects within the time-area closures at Kealakekua Bay and Hōnaunau Bay consist of limited access to some traditional fishing areas. However, the closures were designed to allow for continued shoreline access for gathering of resources such as limu, ‘opihi, and pa‘akai, and exceptions are allowed for transiting through the closures for the purposes of subsistence fishing and canoe paddling.

In consideration of the foregoing the NMFS has determined that undertaking the Preferred Alternative does not have the potential to cause effects on or alterations to the characteristics of historic properties under Section 106 of the NHPA.

6.1.5 Magnuson-Stevens Fishery Conservation and Management Act

The EFH provisions of the MSA require NMFS to provide recommendations to Federal and state agencies for conserving and enhancing EFH if a determination is made that an action may adversely impact EFH. NMFS policy regarding the preparation of NEPA documents recommends incorporating EFH assessments into NEPA analyses; therefore, this FEIS will also serve as an EFH assessment.
Pursuant to these requirements, Chapter 2 of this document provides a description of the alternatives considered to enhance protections for Hawaiian spinner dolphins. Chapter 3 provides a description of the affected environment, including the identification of areas designated as EFH and HAPC (see Appendix D). As detailed in section 4.3.2, NMFS does not expect that EFH, coral reefs, and marine species living in the coral reefs will be directly affected by the proposed action and consequently EFH consultation is not required.

6.1.6 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) requires authorization by the Secretary of the Army to build any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States; and to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States.

Installation of marker buoys to delineate the time-area closures under Alternatives 4 and 5 may require a section 10 permit and a US Coast Guard AtoN permit. NMFS will apply for the necessary permits and work with the Army Corps of Engineers (ACOE) to mitigate any impacts to the waters of the United States, as necessary.

6.1.7 Clean Water Act

Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from section 404 regulation.

As part of the ACOE section 10 permit, Federal agencies must also satisfy the requirements of section 404 of the Clean Water Act to minimize impacts to the waters of the United States. If an

alternative course of action is taken that includes buoy installation (under either Alternative 4 or 5), NMFS will comply with all pertinent regulations.

6.1.8 Data Quality Act

Section 515 of Public Law 106-554, the Data Quality Act, directs that all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for federal agencies.

The final rule package that is accompanying this FEIS has undergone a pre-dissemination review by the Protected Resources Division of PIRO, completed on [INSERT DATE], which determined this information product complies with applicable information quality guidelines implementing the Data Quality Act.

6.1.9 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires that all Federal activities that affect any land or water use or natural resource of the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The preferred alternative (50 yard approach regulation) is consistent to the maximum extent practicable with the enforceable policies of the approved Coastal Zone Management Program of Hawai‘i. This determination, a copy of this document, and the draft environmental impact statement was submitted for review by the Hawai‘i Coastal Zone Management Program which provided concurrence with this determination. If time-area closures (under Alternatives 4 or 5) are found to be necessary and appropriate to protect Hawaiian spinner dolphins, a new determination will be made and submitted to the Hawai‘i Coastal Zone Management Program.

6.1.10 Regulatory Flexibility Act

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency publishes a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis describing the effects of the rule on small entities — that is, small businesses, small organizations, and small government jurisdictions. The initial regulatory flexibility analysis (IRFA) pursuant to section 603 of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq*.; IEC, 2014) is available in the proposed rule, which may be accessed at ww.regulations.gov. A final regulatory flexibility analysis (FRFA) hjas been prepared for the final rule.

6.1.11 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to minimize the paperwork burden for individuals, small businesses, educational and nonprofit institutions, and other persons resulting from the collection of information by or for the Federal government. The Preferred Alternative includes no new collection of information, so further analysis is not required.

6.2 Executive Orders

An Executive Order (EO) is an order having the force of law issued by the President of the United States to the Executive branch of the Government. An EO directs Federal agencies in the execution of congressionally established laws or Executive policies. The following Presidential EOs are relevant to this analysis.

6.2.1 EO 12630 – Takings

Under EO 12630, Federal agencies must consider the effects of their actions on constitutionally protected private property rights and avoid unnecessary takings of property. A taking of property includes actions that result in physical invasion or occupancy of private property, and regulations imposed on private property that substantially affect its value or use. The proposed regulations prohibit take as defined under the MMPA and is expected to result in minimal impacts to water users that comply with safe viewing distances (50 yards). In accordance with EO 12630, the proposed regulations to enhance protections for spinner dolphins do not pose significant takings implications.

6.2.2 EO 12866 – Regulatory Planning and Review

EO 12866 requires agencies to provide to the Office of Management and Budget significant regulatory actions for review. "Significant regulatory action" is defined as those actions that do the following:

- Have an annual effect on the economy of $100 million or more, or adversely affect, in a material way, the economy or a sector of the economy; productivity; competition; jobs; the environment; public health or safety; or State, local or tribal governments or communities
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency
- Materially alter the budgetary impact of entitlements, grants, user fees or loan programs, or the rights and obligations of recipients thereof
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities or the principles set forth in this EO.

Section 5 of this FEIS includes the RIR, which includes an assessment of the costs and benefits of the Proposed Action, in accordance with the guidelines established by EO 12866. This rule has been determined to be not significant under EO 12866.

6.2.3 EO 12898 – Environmental Justice

EO 12898 requires Federal agencies to consider the impacts of their actions on minority and low-income populations with the goal of achieving environmental protection for all communities. The EO directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The EO also directs each agency to develop a strategy for implementing environmental justice. The EO is also intended to promote

nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities' access to public information and public participation.

- The EO defines these groups as 1) **Minority** — all people who are of African American, Asian, American Indian and Alaskan Native, Native Hawaiian, Other Pacific Islander, or Hispanic origin; and **Low Income** — persons whose household income is at or below the U.S. Department of Health and Human Services poverty guidelines.

NMFS has determined, through the analysis of the impacts of this action, that there are no disproportionately high and adverse health or environmental effects on minority or low-income populations.

6.2.4 EO 12988 – Civil Justice Reform

In accordance with EO 12988, the Department of Commerce has determined that this final rule does not unduly burden the judicial system and meets the requirements of section 3(a) and 3(b)(2) of the Order.

6.2.5 EO 13089 – Coral Reef Protection

EO 13089 requires Federal agencies whose action may affect U.S. coral reef ecosystems to do the following:

- Identify their action that may affect U.S. coral reef ecosystems;
- use their programs and authorities to protect and enhance the conditions of such ecosystems; and
- to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems.

Alternative 3A has no potential to affect coral reef habitat. Under the time-area closure alternatives (4 and 5), the installation of buoys has the potential to affect nearby coral reef habitat; however, NMFS would minimize any potential impacts to nearby coral reefs by using best management practices outlined by the ACOE.

6.2.6 EO 13132 – Federalism

EO 13132 requires agencies to take into account any federalism impacts of regulations under development. It includes specific consultation directives for situations in which a regulation will preempt state law, or impose substantial direct compliance costs on state and local governments (unless required by statute). The preferred action, for a 50 yard approach regulation, does not implicate federalism concerns. Accordingly, the Department of Commerce provided notice of the action to the appropriate official(s) of the affected State government.

6.2.7 EO 13158 – Marine Protected Areas

EO 13158 requires Federal agencies to identify actions that affect natural or cultural resources that are within a marine protected area (MPA). It further requires Federal agencies, in taking such actions, to avoid harm to the natural and cultural resources that are protected by an MPA. An MPA is defined under this EO as any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.

MPAs are located at Kealakekua Bay (designated by the State of Hawai‘i as a MLCD and as a National Historic Site), Hōnaunau Bay (designated as a National Historic Site), and at Makako Bay (included within the boundaries of the HIHWNMS). NMFS will endeavor, to the maximum extent possible, to avoid or mitigate potential harm to the natural and cultural resources at these sites.

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Appendices

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Appendix A – Selection Process for Time-Area Closures

NMFS identified those resting areas used regularly or preferred by island associated spinner dolphins for resting, socializing and nurturing young as "essential daytime habitats." In addition to providing an environment for the important daytime behaviors, these essential daytime habitats are believed to be preferred by dolphins because the areas provide environmental conditions that maximize predator detection and reduce the energetic demands of traveling to nightly foraging areas (Norris *et al*. 1994, Thorne *et al*. 2012).

In the MHI, human activities have begun to focus on close interactions with wild spinner dolphins. The essential daytime habitats of resident populations have become primary targets for dolphin-directed activities because spinner dolphins may be predictably found in relatively accessible near-shore waters on a daily basis. The increase in human use of these areas for dolphin-directed activities puts resting spinner dolphins at increased risk of disturbance. Additionally, recurring disturbance to spinner dolphins within these areas diminishes the quality of the habitat because spinner dolphins may not be able to gain optimal rest due to the intensity of dolphin-directed activities. Degradation of these habitats may result in either increased energetic demands to resident spinner dolphins (because more energy may be needed to avoid or respond to disturbance factors within the habitat, or dolphins staying within the habitat may experience a decrease in resting opportunities) or in habitat displacement, both of which could lead to decreased individual fitness and/or negative population level impacts.

While reviewing the need for regulatory actions to enhance protections for Hawaiian spinner dolphins, NMFS recognized that the majority of unauthorized take is likely to occur in those essential daytime habitats that have already been targeted for dolphin-directed activities. Thus, certain actions to enhance protections for dolphins within those essential daytime areas targeted by people wanting to interact with them may serve to reduce the incidents of unauthorized take.

NMFS sought to identify those essential daytime areas throughout the MHI that may be targeted for dolphin-directed activities. Once NMFS identified those areas, NMFS focused on identifying areas where limited resources may be put to the best use in creating effective management measures for spinner dolphin habitats while using an adaptive management approach. NMFS established criteria based on enforcement resources, logistical feasibility and human considerations to select areas where regulations would be most effective in providing enhanced protections for spinner dolphin essential daytime habitat.

NMFS used the following step-down process to select the five areas identified for time-area closures from Alternative 4 and 5. The tables in this appendix review the information NMFS gathered throughout this process. NMFS identified the sources of information used throughout this review in the bullets under Steps 1 and 2. The bulleted items under Step 3 review the criteria that NMFS used to evaluate areas for potential closure; NMFS established a description of these criteria following Step 3. All information gathered throughout this process is summarized in the tables that follow, which are color-coded to identify various differences between the sites evaluated.

1. NMFS identified known Hawaiian spinner essential dolphin daytime habitats based on current knowledge by:

- Reviewing scientific literature regarding Hawaiian spinner dolphin use of areas throughout MHI
- Requesting and reviewing information from scientists working in the MHI
- Coordinating with State of Hawai‘i and current stakeholders to identify any additional spinner dolphin resting areas
- Coordinating with stakeholders for additional information
- Reviewing scoping comments for additional information

NMFS identified 67 areas during this process, but not all areas were essential Hawaiian spinner dolphin resting areas.

2. NMFS identified essential daytime habitats where people most often interact or attempt to interact with Hawaiian spinner dolphins by:

- Reviewing scientific literature for information regarding Hawaiian spinner dolphin disturbance
- Coordinating with NOAA OLE to discuss areas where spinner dolphin disturbance has been recorded, reported or observed
- Coordinating with the State of Hawai‘i; discussion points included identifying additional areas where disturbance to spinner dolphins may occur and areas closed by state regulations
- Coordinating with other concerned stakeholders for additional interaction information.
- Reviewing scoping comments for additional information

From those 67 areas, NMFS identified 12 areas as essential daytime habitats where Hawaiian spinner dolphins exhibit signs of disturbance as a result of human activities. Table A-2 (below) compiles information about spinner dolphin use and human disturbance (step 1 and 2) for all 67 areas. Areas highlighted in light blue on Table A-2 are the 12 essential daytime habitats where spinner dolphins exhibit signs of disturbance as a result of human activities and which may be considered to be targeted for dolphin-directed activities. Those areas that are not highlighted either have too little information to determine if the area is an essential daytime habitat or there is not enough information to indicate that the area is targeted for dolphin-directed activities.

3. NMFS identified areas (from those identified in the second step) where closures are likely to be most effective based on the following criteria:

- Environmental conditions support a discrete closure site for resting Hawaiian spinner dolphins
- Enforcement is logistically feasible based on resources and accessibility
- The site may be easily accessible for scientific monitoring purposes
- Closure of the area does not restrict major harbors, Ocean Recreation Management Areas (ORMAs) or transit zones

- Nearby areas are still accessible for activities that are not spinner dolphin-directed

Description of Evaluation Criteria

Environmental conditions support a discrete closure site. This criterion establishes whether or not the site in question may be reasonably identified as a closed site, either through demarcation or by using easily identifiable environmental boundaries. For example, a small bay may be considered easy to demarcate for closure either using buoys or environmental markers, whereas a large extended area that is not surrounded by any specific environmental features may not easily support a closure site.

Enforcement availability. Current limitations in enforcement resources and the remote nature of some sites make these areas logistically more difficult to effectively enforce regulation measures. Prohibitions that are not enforced may be less effective in accomplishing the protective efforts for spinner dolphin habitat.

Accessibility for monitoring. Areas that are accessible for monitoring may best fit into an adaptive management approach and will best demonstrate the effectiveness of any implemented enhanced protective efforts.

Closure does not restrict major harbors or transit zones. Closure of some identified resting habitats could completely restrict boating access to major harbor or transit zones creating additional human impacts.

Availability of nearby and accessible alternative areas for human use. Some coastlines of the MHI may be limited in the amount of available recreation and fishing areas for ocean users, thus closure of these sites may severely impact local populations.

NMFS reviewed the above criteria for the 12 areas identified in step 2 (and highlighted in light blue in Table A-2); these areas are referred to as targeted essential daytime habitats. Table A-3 (below) summarizes the information gathered for the five criteria under step 3 for each of the 12 targeted essential daytime habitats. The five bays selected for time-area closures (and highlighted in light blue in Table A-3) were areas where we could answer "yes" to a majority of the established criteria and where we did not answer "no" to any of the established criteria. For example, Makako Bay was selected for a time-area closure site because environmental conditions support a discrete closure, the closure would not obstruct a major harbor or transit zone, there are alternative areas nearby that are accessible for human use, enforcement may access this site easily, and the areas could be accessed for research. For further example, Honokōhau Harbor was not selected because a closure would obstruct a harbor and there is limited access to harbor space along this coastline for sizable boats to use.

Table A-1. Spinner dolphin daytime habitat areas, as identified through literature review, stakeholder coordination and scoping efforts. Colors correspond with Island location.

Island	Location of Spinner Daytime Habitat Area		
Kauaʻi	Hanalei	Līhuʻe	Secret Beach
	Hanapēpē and Kaumakani	Nāpali Coast	Waimea Coast
	Kahala Point	Poʻipū Beach	
Oʻahu	Kahana Bay	Pōkaʻī Bay	Waiʻanae Coast
	Kahe Point (Electric Beach)	Portlock	Waimea Bay
	Mākua Bay	South Shore	Yokohama Bay
Molokai	ʻĀhihi Bay (off Cape Kīnaʻu)	Hāna Coast	Kalaupapa
	Cape Hālawa	Honolua Bay	
Lānaʻi	Hulopoʻe Bay	Mānele Bay	Southeast Coast of Lānaʻi
Maui	Kāʻanapali	Lahaina	Mākena
	La Perouse Bay	Līpoa Point	Paʻuwela
Hawaiʻi (Big Island)	Ailia Point	Kapua Bay	Mahaiʻula and Makalawena
	ʻĀpua Point	Kauhakō Bay (Hoʻokena)	Māhukona (just South)
	Cape Kumakahi	Kawaihae Harbor (from Kawaihae to Honoipu)	Makako Bay (including Hoʻona Bay)
	Hōnaunau Bay	Kāwili	Manukā Bay
	Honokoa Bay	Keahole Point	Miloliʻi
	Honokōhau Harbor	Kealakekua Bay	Okoe Bay
	Honomalino Bay	Keauhou Cove	Opilukao Cove
	Honuʻapo	Kehena Beach	Puakō
	Kailua Bay	Kīholo Point	Puʻu Kuili
	Kalapana	Kua Bay	South Point
	Kaloli Point	Laupāhoehoe	Waikoloa Beach
	Kamoi Point	Leleiwi	Waipiʻo Valley Bay

Table A-2. Step 1 and Step 2 – Table A-2 documents information gathered from various sources on resting areas in the MHI regarding dolphin use and human disturbance. NMFS used this information to determine whether areas could be considered essential daytime habitat and if human disturbance appears to be a chronic problem at these sites.

Table A-2 - Resting Sites on Kauaʻi					
Sites	**Reference**	**Information Regarding Dolphin Use**	**Information Regarding Human Disturbance**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Hanalei	Sepez 2006	Dolphins may be found here, no numbers or frequency given.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Hanapēpē & Kaumakani	Norris & Dohl 1980	Groups of dolphins reported as around 60 animals.		No = Group size indicated as large; however, not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Kahala Point	Norris & Dohl 1980	Group size reported between 70-80 animals. Dolphins tended to be located just north of the point.		No = Group size indicated as large; however, not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Kauaʻi					
Sites	**Reference**	**Information Regarding Dolphin Use**	**Information Regarding Human Disturbance**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Līhuʻe	Sepez 2006	Dolphins may be found here, no numbers or frequency given.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Nāpali Coast (Mentioned as south Nāpali in Sepez 2006)	Norris & Dohl 1980	Largest groups of dolphins seen at this site, around 150 animals.		Yes = Larger numbers of dolphins using area as resting area reported by Norris & Dohl. Site still indicated as a dolphin resting area in 2006 publication.	Maybe = Tour vessels and kayaks may disturb dolphins while touring the coastline, but activities do not appear to be dolphin directed at this time.
	Sepez 2006	Dolphins may be found here, no numbers or frequency given.	Kayakers and tours vessels are likely to encounter dolphins while touring the area, but activities are not dolphin directed.		
Poʻipū Beach	Sepez 2006	Dolphins may be found here, no numbers or frequency given.	Beach based swimmers may be using this site to interact with dolphins.	No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	Maybe = Not enough information reported regarding human disturbance at this site to determine the intensity of interaction.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Kaua'i					
Sites	**Reference**	**Information Regarding Dolphin Use**	**Information Regarding Human Disturbance**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Secret Beach	M. Hawkes (Kilauea Point NWR manager), personal communication, August 20, 2007	Volunteers in this area have recorded a presence/absence in this area.	Swimmers from shore reported as interacting with dolphins at this site.	No = Not enough information regarding spinner use of this site to determine that this is an essential daytime habitat for spinner dolphins.	Maybe = Not enough information reported regarding human disturbance at this site to determine the intensity of interaction.
	Sepez 2006		Beach based swimmers reported here, but waters are noted as rough and may be only seasonally accessible.		
Waimea Coast	Sepez 2006	Dolphins may be found here, no numbers or frequency given.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Kauaʻi					
Sites	**Reference**	**Information Regarding Dolphin Use**	**Information Regarding Human Disturbance**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Lehua Crater (Off Niʻihau)	Sepez 2006	Dolphins may be found here, no numbers or frequency given.	Tour dive vessels from Port Allen are most likely to interact with dolphins.	No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	Maybe = Commercial vessels may disturb dolphins while touring, but activities do not appear to be dolphin directed at this time.
Channel between Lehua and Niʻihau	Sepez 2006	Dolphins may be found here, no numbers or frequency given.	Tour dive vessels from Port Allen are most likely to interact with dolphins.	No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	Maybe = Commercial vessels may disturb dolphins while touring, but activities do not appear to be dolphin directed at this time.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Oʻahu						
	Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
South Shore Oʻ ahu	Barbers Pt to Koko Head Crater	Lammers 2004	This area was not stated by Lammers as a "primary" site, but it was used frequently (56%). He does state that dolphins did not exhibit a preference for any specific location within this area. Dolphins in this area were reported to have a strong affinity for the 10 fathom isobath. Group sizes were reported largest in the morning with approximately 50-65 individuals. The larges recorded was 110-120 animals.		Maybe = Publications appear to indicate some debate about the importance of this area to local dolphin groups. Although used by dolphins in large numbers the rough waters make dolphin sightings at this site less predictable.	No = Site is not indicated in publications as an area where frequent disturbance occurs.
	Diamond Head to Koko Head	NOAA PIRO PRD outreach at Maunalua Bay Heritage Festival, 2011	People have noted observing dolphins in this area in the past. Dolphins reported near Portlock, the Northeast corner of the bay and off Diamond Head. Dolphin group sizes ranged from 5-100.	Paddling, boating, surfing, and SCUBA common in this area.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on O‘ahu						
	Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
South Shore O‘ ahu (Continued)	Ewa/Honolulu	Lammers 2004	Between Honolulu Harbor and Barbers Point. Lammers states that these dolphins are year-round residents, and were seen with regular occurrence, but does not specifically state this area as "primary." The mean number of animals reported was 34.5 and the frequency of occurrence was recorded as 67%. The dolphins in this area were located close to shore and close to the 10 fathom contour.		Maybe = Publications appear to indicate some debate about the importance of this area to local dolphin groups. Although used by dolphins in large numbers the rough waters make dolphin sightings at this site less predictable.	No = Site is not indicated in publications as an area where frequent disturbance occurs.
	Pearl Harbor to Makapu‘u Pt	Norris & Dohl 1980	Group sizes were reported between 40-250 animals, but occurrence may not be as often as Wai‘anae groups.			
		Sepez 2006		Dive boats may sometimes interact with dolphins, but dolphins are harder to find so tour boats don’t target this area		
	Portlock	J.LeFors pers. observation	Has seen and heard dolphins here while scuba diving.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on O‘ahu						
	Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Wai‘ anae Coast	Kahe Point (Electric Beach)	Lammers 2004	Area indicated as a primary resting area, dolphin occurrence reported as 52.4% of sightings from this spot.		Yes = Various publications indicate that different regions of the Wai‘anae Coast provide primary resting areas for spinner dolphins.	Yes = Information indicates that dolphins may be disturbed regularly by both vessel interactions and beach based swimmers along this coastline.
		Lammers 2004	Kahe Point indicated as a primary resting area. Dolphins were noted using the northern end of the area near Kahe Point. The mean group size was reported as 43 (+/- 29), but as high as 100 animals at times. Dolphin occurrence at this site was reported as 45% of the time observed.			
		Sepez 2006		This site is the second stop for tour boats from Wai‘anae Harbor and Koolina Marina. Beach based swimmers also use this site to interact with dolphins.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on O‘ahu						
	Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Wai‘ anae Coast (Continued)	Kalaeloa Barbers Point	Lammers 2004	Area not considered a primary resting area North before Kahe Point and South at Barbers Point.		Yes = Various publications indicate that different regions of the Wai‘anae Coast provide primary resting areas for spinner dolphins.	Yes = Information indicates that dolphins may be disturbed regularly by both vessel interactions and beach based swimmers along this coastline.
	Mākua Bay	Danil 2005 (Mākua)	Area indicated as an optimal resting area with a lot of dolphins moving in and out of groups in this area. Group size averaged 67 animals. Spinner dolphins were observed on 52 out of 53 days at Mākua beach.	A max of 63 people reported as beach based swimmers at this site. Higher numbers of swimmers were recorded on the weekends. Pursuit of dolphins was commonly observed at this site and dolphins trying to elude swimmers were sometimes confronted with more nearby swimmers. Author suggested dolphin rest was delayed and compressed at this site.		
		Lammers 2004	Area indicated as a primary resting area with dolphins reported 95.2% of the time observed at this site.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Oʻahu						
	Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Waiʻ anae Coast (Continued)	Mākua Bay (Continued)	Sepez 2006		Tours from Waiʻanae Harbor and Koolina use Mākua as the first stop to view dolphins. Kayakers used to use bay, but less common now. Beach based swimmers still use the area.	Yes = Various publications indicate that different regions of the Waiʻanae Coast provide primary resting areas for spinner dolphins.	Yes = Information indicates that dolphins may be disturbed regularly by both vessel interactions and beach based swimmers along this coastline.
	Pōkaʻī Bay	Lammers 2004	Indicated as a primary resting area with dolphin occurrence at this site 87.5% of the time.			
	Northwest coast of Oʻahu	Marten & Psarakos 1999	Studied an unspecified "resting area along the Northwest coast of Oʻahu." 125 dolphins were individually identified in this area over a 4 year study period from 95-98.			
		Delfour 2007	Same area as Marten & Psarakos study. Area described as critical in value and that dolphin habitat use was stable over 3 years. Mean group size ranged from 31.1 - 46.3 through 2001 - 2004.	Study observed changes in dolphin swimming directions with human approaches and an increase in dolphin aerial behavior after encounters. The study observed an increase in dolphin-watch tours, swim-with-dolphin programs, and kayaks.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Oʻahu						
	Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Waiʻ anae Coast (Continued)	Waiʻanae Coast from Barbers Pt to Kaʻena Pt	Lammers 2004	Area indicated as a primary resting area at Mākua Beach, Pōkaʻī Bay and Kahe Point. Dolphin groups were reported as large in the morning with groups ranging in size from 20-40 animals. The largest group reported ranged from 110-120 animals. Dolphin frequency of occurrence reported as 75.1% (42/63).	Reported possible changes in animal distribution as a result of humans.	Yes = Various publications indicate that different regions of the Waiʻanae Coast provide primary resting areas for spinner dolphins.	Yes = Information indicates that dolphins may be disturbed regularly by both vessel interactions and beach based swimmers along this coastline.
	Waiʻanae Coast - Kahe, Pōkaʻī, Waiʻanae Boat Harbor, Mākua, Yokohama, Kaʻena Point, Mākaha Beach, Nānākuli, Keawa'ula	Sepez 2006	Noted spinner dolphins found in all areas.	Dolphin tours from Koolina and Waiʻanae target Mākua Beach first and Kahe second. Some tours put swimmers in the water with dolphins		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on O‘ahu					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Waimea Bay	Norris & Dohl 1980	Small groups of dolphins were reported at this site.		No = small groups mentioned in 1 publication, but no additional information regarding frequency of use to indicate site as a primary resting area.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Maui					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
ʻĀhihi Bay (off Cape Kīnaʻu)	Sepez 2006	Dolphins are reported as common at this site.	Dolphin directed activities at this site were once common from commercial tours, but the area is a Natural Areas Reserve System now and closed to commercial activity. Beach based swimming is still possible but access to the site is now prohibited.	Maybe = Limited data on dolphin use; however, since this area was once used by tour operators for dolphin interactions, regular dolphin use of the area is likely.	No = Commercial boating bans in this area seem to have alleviated dolphin disturbance in this area, and recent exclusion from human foot traffic has ended the use of this site.
Hāna Coast	Norris & Dohl 1980	Small groups of dolphins are reported at this site.		No = small groups mentioned in 1 publication, but no additional information regarding frequency of use. Therefore, at this time there is not enough information to indicate site as a primary resting area.	No = No information reported regarding human disturbance at this site.
Honolua Bay	Sepez 2006	Dolphins are reported as common at this site.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Maui					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kāʻanapali	Sepez 2006	Dolphins are reported as common at this site.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Lahaina	Norris & Dohl 1980 (Lahaina Roads - Auau Channel)	Reported dolphin presence as seldom seen in these areas.		No = Dolphin presence appears sporadic.	No = Information does not indicate regular human disturbance at this site.
	Sepez 2006	Dolphin use of this area indicated as periodic, though not daily	Commercial tour boats are likely to encounter dolphins, but the harbor traffic does not allow for swimmers to enter water.		
La Perouse Bay	Sepez 2006	Dolphins are reported as common at this site, but also noted to not occur daily.	This area is best known for both beach-based swim with dolphins activity and motor vessel activity. The waters in this area can be challenging and may present some obstacle to swimmers. The area is advertised in a well known Maui guide book as a place to swim with spinner dolphins. Local reports say dolphins do not come as often to this area as in the past. This is believed to be due to human presence in both a negative and positive way.	Yes = Dolphin presence may vary based on time of year. It is difficult to determine if dolphin use of the area is seasonal or if dolphin use of the area has changed over time perhaps due to human presence in the area.	Yes = Area is known to be used for swim-with-wild-dolphin activities. Publicity of site makes it a target for humans wishing to interact with spinner dolphins.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Maui					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
La Perouse Bay (Continued)	Hawai'i Wildlife Fund 2008	Dolphins reported as present on average 19% of days surveyed depending on time of day and month of year. High presence was recorded as 50% in August and low presence was recorded as 0% in February. (HWF only records presence or absence at this site and has a low sample size.)		Yes = Dolphin presence may vary based on time of year. It is difficult to determine if dolphin use of the area is seasonal or if dolphin use of the area has changed over time perhaps due to human presence in the area.	Yes = Area is known to be used for swim-with-wild-dolphin activities. Publicity of site makes it a target for humans wishing to interact with spinner dolphins.
	J. Fell-McDonald (DLNR Ranger)pers. communication.	Reported dolphin presence as common at this site.	Mainly swimmers from shore but a few zodiac tour boats also come here with snorkelers. Reports that dolphins try to avoid swimmers, show increased aerial behavior, tail slapping, and increased speed when approached.		
	Take Tompson (NOAA OLE);personal communication		NOAA OLE officers report receiving approximately 25 complaints about dolphin disturbances a year at this site.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Maui					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Līpoa Pt	Norris & Dohl 1980	Small groups of dolphins are reported at this site.		No = small groups mentioned in 1 publication, but no additional information regarding frequency of use. Therefore, at this time there is not enough information to indicate site as a primary resting area.	No = No information reported regarding human disturbance at this site.
Mākena	Sepez 2006	Dolphins are reported as common at this site.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Pa‘uwela	J. Fell-McDonald (DLNR Ranger), personal communication, June 20, 2007	Dolphins are reported as using this site.	Local residents swim from shore. Remote location prevents this from becoming a popular site for swimming with dolphins.	No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	Maybe = Not enough information reported regarding human disturbance at this site to determine the intensity of interaction.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Lānaʻi					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Holupoe Bay	Sepez 2006	Dolphins are reported as common at this site.	Commercial tours drop snorkelers off from Maui to view dolphins here. Activities are not necessarily dolphin directed, but the dolphins entrance to area draws attention from snorkelers. Hotel used to promote beach based swimming.	Yes = Dolphin use of the area has been frequent in the past and the whole southeast portion of Lānaʻi is noted for its importance to spinner dolphins.	Yes = Disturbance of resting dolphins by swimmers regularly occurs here, although the education program started at the hotel appears to be helpful in alleviating some of the problem. It is not known how often outside tour operations may be causing disturbance at this site.
	J. LeFors pers. observation	Has observed dolphins here on several site visits.	Beach based swimming from hotel no longer promoted; however, many people still attempt to interact with dolphins. Tour boats also come from Maui bringing guests to swim with dolphins. Dolphin using the area have been observed avoiding swimmers by moving farther offshore.		
	W. Sarme (Park Manager and lifelong resident), personal communication, June 23, 2008	Dolphins reported as once common at this site, but now infrequent. Dolphins use the West end of the bay (nearest to the hotel).	Beach based swimmers. People come over from Maui to camp and swim with the dolphins. Dolphins no longer come in close to shore and not on a daily basis as they did before the hotel was built.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Lānáʻi					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Mānele Bay	Norris & Dohl 1980	Dolphins are reported as common at this site. Group size reported as large, ranging from 40-100 animals.		Yes = Dolphin use of the area has been frequent in the past and the whole southeast portion of Lānaʻi is noted for its importance to spinner dolphins.	No = While viewing is possible information has not indicated a disturbance problem within the bay because the boat harbor traffic keeps people from swimming here.
	Sepez 2006	Vessel captains reported 80% encounter rates with dolphins at this site.	Vessels may view dolphins in area, but swimmers not launched because its unprotected and due to boat traffic.		
Southeast Coast of Lānáʻi	Norris & Dohl 1980	Large groups of dolphins reported at this site.		Yes = Dolphin use of the area has been frequent in the past and the whole southeast portion of Lānaʻi is noted for its importance to spinner dolphins.	No = While viewing is possible information has not indicated a disturbance problem.
	Sepez 2006	Dolphins are reported as common at this site.	Vessels may view dolphins in area, but swimmers not launched because its unprotected		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Moloká i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Cape Hālawa	Norris & Dohl 1980	Small groups of dolphins reported at this site.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Kalaupapa	Norris & Dohl 1980	Small groups of dolphins reported at this site.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
	E. Brown (Biologist NPS), personal communication, September 21, 2009	Dolphins are reported as infrequent at this site.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites Between Molokaʻi & Lānaʻi					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kalohi Channel	Norris & Dohl 1980	Dolphins are reported as seldom seen at this site.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Penquin Banks (western Molokaʻi & Lānaʻi)	Norris & Dohl 1980	Large groups of dolphins reported at this site.		Maybe = Large groups seem to indicate some importance to spinner dolphins; however, not enough information regarding frequency of use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites Kahoʻolawe					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
South shore of Kahoʻolawe near Hālona Pt.	Norris & Dohl 1980	Large groups of dolphins reported at this site.		Maybe = Large groups seem to indicate some importance to spinner dolphins; however, not enough information regarding frequency of use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Ailia Point	Norris *et al*. 1994	Two groups observed in period of Feb-Apr during a biweekly aerial survey effort that spanned a year. Groups observed ranged in size from 1-50; 51-100.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
ʻĀpua Point	Norris *et al*. 1994	One group observed in a 4 month period during biweekly aerial survey efforts that spanned a year. Specific size of group not reported, may range from 1-50 animals.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Cape Kumukahi	Norris & Dohl 1980	Animals noted to use several small irregular bays along the southern edge of the cape, forming the "home bay" in the area. Animals appear to range as far as Opilukao Cove. Group using this area estimated to be around 30 animals.		Maybe = Area acknowledged to be a consistent site for spinner dolphin rest in 1980. 1994 observations indicate that the area may at the least be used seasonally.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Cape Kumukahi (Continued)	Norris *et al*. 1994	Four groups of animals sighted during 2 times of the year, on biweekly aerial surveys conducted throughout a year. Group sizes were reported as large ranging from 1-50 and 51-100. Observations for this site includes areas between Hilo and Cape Kumukahi.		Maybe = Area acknowledged to be a consistent site for spinner dolphin rest in 1980. 1994 observations indicate that the area may at the least be used seasonally.	No = No information reported regarding human disturbance at this site.
Hōnaunau Bay	Norris & Dohl 1980	Less commonly group from Kealakekua may be found here.		Yes = Multiple sources recognize this area as a resting area for spinner dolphins; however, the frequency of dolphin use appears lower than it was historically and lower than at other primary resting locations.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. The density of traffic in the relatively small area of this site may increase the intensity of disturbance.
	Norris *et al*. 1994	Four groups of dolphins noted in and around the Bay across 8 months of the year of biweekly aerial survey efforts. Group size for animals sighted on aerial surveys ranged from 1-50 and 51-100.			
	Sepez 2006	Mentioned as a place spinner dolphins are found, but no numbers or frequency of occurrence indicated.	Part of the 3 bay complex that hosts resident and visitor beach-based swimmers looking for dolphins. Tour vessels do use this area, seldom used by kayaks. The density of humans and vessels said to be highest of all Big Island locations.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Hōnaunau Bay (Continued)	Courbis 2007	Dolphins reported on 5 out of 20 days.	Data indicate marine tourism increased dramatically in last several decades. Observed mostly swimmers in this area but some kayakers too.	Yes = Multiple sources recognize this area as a resting area for spinner dolphins; however, the frequency of dolphin use appears lower than it was historically and lower than at other primary resting locations.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. The density of traffic in the relatively small area of this site may increase the intensity of disturbance.
	Courbis & Timmel 2009	Mean group size indicated as 19.3 and dolphins observed on 5 out of 23 days.	Aerial behavior when entering bay observed once out of 5 days; however, no previous studies to compare for this area. Swimmers and snorkelers were noted as most common.		
	Ostman-Lind 2009	Dolphins observed on 14% of survey days. Groups use the deeper, northern part of the bay.	Frequency of aerial behavior was positively affected by human proximity. Snorkelers were noted for this publication.		
	Ostman-Lind *et al*. 2004	Area identified as critical by researchers.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Hōnaunau Bay (Continued)	J. Medeiros(Lifelong resident on the bay), personal communication, May 15, 2009	Dolphins used to frequently use the bay in the past but rarely come now.	Dolphins used to come in to bay and fish at night, but have not for about a year now. Big groups of people now come to this area several times a week.	Yes = Multiple sources recognize this area as a resting area for spinner dolphins; however, the frequency of dolphin use appears lower than it was historically and lower than at other primary resting locations.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. The density of traffic in the relatively small area of this site may increase the intensity of disturbance.
	L. Navas-Loa (family has lived in area for generations), personal communication, June 27, 2007	Used to come into bay at 6:30-7AM on almost daily basis, now seen infrequently.	People bring toys for the dolphins to swim through and play the "leaf game". Dolphins are using habitat they never used before.		
Honokoa Bay	Ostman-Lind *et al*. 2004	Area identified by researchers as secondary resting habitat.		No = Information indicates that this may be a secondary resting site for spinner dolphins; there is no information to indicate it as a primary resting site.	No = No information reported regarding human disturbance at this site.

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Honu'apo	Norris *et al*. 1994	One group observed in a 4 month period during biweekly aerial survey efforts that spanned a year. Specific size of group not reported, but may range from 1-50 animals.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Honokōhau Harbor	Norris & Dohl 1980	Largest groups identified as centered at Keahole Point, but ranging from Honokōhau to Kīholo Bay. (~200-250 animals). From Honokōhau to Kīholo Bay dolphins do not appear to occupy small coves consistently, rather they congregate over the extensive area of shallow water, moving back and forth.		Yes = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
	Norris *et al*. 1994	Largest groups identified as occurring from here to Kīholo Point. One group sighted specific to this area during biweekly aerial surveys efforts conducted across a year.			
	Sepez 2006	Mentioned as a place spinner dolphins are found, but no numbers or frequency of occurrence indicated.	Tour vessels originate out of the harbor, but little description is paid to dolphin interaction on site.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Honokōhau Harbor (Continued)	Ostman-Lind 2009	Dolphins present in 58% of survey days. Groups located between harbor entrance and green buoy, includes part of boat channel.	Frequency of aerial behavior was positively affected by human proximity. Vessels and few swimmers noted here.	Yes = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
	Ostman-Lind *et al*. 2004	Researchers identified this area as critical.			
	Take Tompson (NOAA OLE);personal communication		NOAA OLE officers report receiving approximately 2 complaints about dolphin disturbances a year at this site.		
Honomalino Bay	C. Leslie (Local fisherman), personal communication, October 2, 2008	Spinner dolphins were observed here, frequency and numbers were not reported.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
	G. Kahele (Lifelong resident of Miloli'i), personal communication, June 28, 2007	Spinner dolphins were observed here, frequency and numbers were not reported.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kailua Bay	Norris & Dohl 1980	Not uncommonly part of dolphins from Honokōhau to Kīholo Bay area move to this area and are known as the "North Kona School."	Dolphins don't appear to reach quiescence here due to the boat traffic from the harbor.	Yes = Reports from area indicate that this the area and surrounding waters may be used regularly for dolphin resting.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
	Norris *et al*. 1994	Dolphins most often noted just south of here. Groups observed ranged in size from 1-50; 51-100; and greater than 100. Six groups of dolphins noted in south of the Bay across 8 months of the year of biweekly aerial survey efforts.			
	Sepez 2006		Vessels depart from area and head to Makako Bay, Makalawena Beach and Kua Bay. Swimmers may swim from the pier but unlikely due to vessel traffic.		
	Ostman-Lind *et al*. 2004	Researchers identified this area as critical.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kailua Bay (Continued)	J. LeFors (NMFS Staff) pers. observation	Has observed dolphins here on several site visits.	Several tour boats observed converging on dolphin group, dropping snorkelers in the water. Dolphins swam away to avoid the boats but are followed. Vessels reload swimmers, following the dolphins and then dropping swimmers in the water again.	Yes = Reports from area indicate that this the area and surrounding waters may be used regularly for dolphin resting.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
Kalapana	Norris *et al*. 1994	One group observed in a 4 month period during biweekly aerial survey efforts that spanned a year. Group size not specifically reported, but may range from 51-100 animals.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Kamoi Point	Norris *et al*. 1994	Two sightings of groups observed both within a 4 month period of biweekly survey efforts that spanned a year. Exact group size not indicated may range from 1-50.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kapuʻa Bay	G. Kahele (Lifelong resident of Miloliʻi), personal communication, June 28, 2007	Spinner dolphins were observed here, frequency and numbers were not reported.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
	C. Leslie, personal communication, October 2, 2008	Spinner dolphins were observed here, frequency and numbers were not reported.			
Kauhakō Bay (Hó okena)	Norris & Dohl 1980	Less commonly spinner dolphins from Kealakekua found here.		Yes = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. Swimmer interaction at this site appears to be of greatest concern.
	Norris *et al*. 1994	Six groups of dolphins observed across 9 months of the year of biweekly aerial survey efforts. Groups of dolphins observed ranged from 1-50; and 51-100.			
	Sepez 2006		Part of the 3 bay complex that hosts resident and visitor beach-based swimmers looking for dolphins. No boat launch but kayakers enter here looking for dolphins.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kauhakō Bay (Hō okena) (Continued)	Courbis 2007	Dolphins observed on 11 out of 16 days.	The number of swimmers observed was significantly higher when dolphins were present. Data indicated marine tourism increased dramatically in last several decades. Mostly swimmers at this site.	Yes = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. Swimmer interaction at this site appears to be of greatest concern.
	Courbis & Timmel 2009	Dolphins observed on 11 out of 18 days. Mean group size was recorded as 25.	Observed dolphin aerial behavior when entering bay on only 5 out of 11 days; however, no previous studies to compare this behavior. The number of aerial behaviors per hour was significantly higher at Kauhakō than at other 2 bays. Almost all human activity is directed at approaching and interacting with the dolphins. Activity is mostly swimming.		
	Ostman-Lind 2009	Dolphins observed on average 35% of survey days.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kauhakō Bay (Hō okena) (Continued)	Ostman-Lind *et al*. 2004	Researchers identified this area as critical.		Yes = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. Swimmer interaction at this site appears to be of greatest concern.
Kaloli Pt	Norris & Dohl 1980	Largest group seen on the windward side seen here, estimated at approximately 100 dolphins. Dolphins typically found in the bay protected by the point and fringing coral reefs. Appears to be the northern most area of occupancy on the windward side of the island.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Kawaihae Harbor (from Kawaihae to Honoipu)	Norris & Dohl 1980	Dolphins occasionally seen or reported here. Group size reported as 10-30 animals.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kawaihae Harbor (Continued)	Norris *et al*. 1994	Use of area does not appear regular based on year long biweekly aerial survey efforts. Only 1 group sighting of 51-100 animals just north of the Harbor area.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Kāwili	Sepez 2006	Mentioned as a place spinner dolphins are found, but no numbers or frequency of occurrence indicated.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Keāhole Pt	Norris & Dohl 1980	Largest groups, 200-250 animals, identified as centered at Keahole Point, but ranging from Honokōhau to Kīholo Bay. From Honokōhau to Kīholo Bay dolphins do not appear to occupy small coves consistently, rather they congregate over the extensive area of shallow water, moving back and forth.		Maybe = Area acknowledged to be a consistent site for spinner dolphin rest in 1980. 1994 observations report use of the area, but consistent use seems to be wide spread across whole area (from Honoko hau to Kīholo) not just at the point.	
	Norris *et al*. 1994	Not clear if dolphin use at this site is regular based on year long biweekly aerial survey efforts. When observed dolphin groups were large with 180-200 animals recorded.			No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kealakekua Bay	Doty 1968	Refers to dolphin presence as regular with groups ranging from 30-80 animals. Dolphins used area in the vicinity of Manini Beach Point.		Yes = Area acknowledged as a primary resting spot based on several publications and multiple surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
	Norris & Dohl 1980	Dolphins recorded as present 74% of observed days. Dolphin groups ranged from 2-70 animals with an average group size of 25. Most commonly occupied the deeply indented bay, but sometimes found on the shallow area north of the bay to Keauhou or occasionally nearly to Kailua-Kona.			
	Norris *et al*. 1994	Commonly used by dolphins based on aerial surveys throughout a year. Mean number of dolphins present was 33.5, with a max of 80 animals. Most commonly occupied the deeply indented bay, but sometimes found on the shallow area north of the bay to Keauhou or occasionally nearly to Kailua-Kona.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kealakekua Bay (Continued)	Sepez 2006		Motorized vessels use this area for viewing dolphins, although the author notes that vessels report a code of conduct regarding dolphin approach. Part of the 3 bay complex that hosts resident and visitor beach-based swimmers looking for dolphins. Kayaks also frequent this area due to the Captain Cook Monument. People swimming with dolphins have been noted to bring toys and leaves into water to instigate "playing" behavior from dolphins.	Yes = Area acknowledged as a primary resting spot based on several publications and multiple surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
	Courbis 2007	Dolphins present 9 out of 13 days.	Data indicates marine tourism increased dramatically in last several decades. Mostly swimmers and kayakers seen here.		

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance?**
Kealakekua Bay (Continued)	Courbis & Timmel 2009	Dolphins present 9 out of 13 days. Mean group size reported as 27.1.	Study documented swimmers or vessels as always present when dolphins were present. Changes in dolphin aerial behavior patterns were recorded compared to previous studies. Dolphin aerial display not observed 6 of 10 times when entering bay and aerial behavior was not observed at all when exiting bay. Additionally dolphins displayed tail slapping, spinning, and leaping when approached by swimmers or vessels. Dolphins never went without aerial behaviors for large portions of the day as compared to Norris & Dohl 1980 study. Interruption of rest frequently observed during this study but rarely observed during 1980 study. Swimmers, snorkelers and kayakers noted in this study.	Yes = Area acknowledged as a primary resting spot based on several publications and multiple surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kealakekua Bay (Continued)	Ostman-Lind 2009	Dolphins presence 42% of survey days. Dolphins used the area against the steep cliffs in the northeastern part of the bay.	Frequency of dolphin aerial behavior was positively affected by human proximity. Significantly more aerial behaviors were recorded when people were within 100 meters of the dolphins. Snorkelers, swimmers, kayakers and tour boats noted.	Yes = Area acknowledged as a primary resting spot based on several publications and multiple surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
	Ostman-Lind *et al*. 2004	Area reported as critical to dolphins. Mean group size reported at 47.7, with a max of 175 animals.	Mean number of dolphins per group was significantly smaller than documented in studies between 1989 and 1992. Overall a 26% reduction in group size noted.		
	Forest thesis 2001	Dolphins present on 58% of observation days. Mean group size was 33, with a range of 4 - 90 animals. Mean in the winter was reported as less than 20, in the spring as 40.	Dolphins behaviors recorded as changed due to human disturbance including asynchronously surfacing, an increase in frequency of aerial behaviors in afternoon, bow riding, and avoidance behaviors. Swimmers, motorboats and kayaks noted in this area.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kealakekua Bay (Continued)	Timmel *et al* 2008	Dolphins present 67% of the time. Mean group size 30. In a band b/w 50-500m from shore in all but the SE quarter of the bay. Most protected part of the bay. Never near Nāpōʻopoʻo pier, where human presence is high.	Dolphin behavior changes recorded included reorientation- or changes in direction, may swim faster in the presence of faster vessels (weak correlation). May tolerate the close presence of swimmers and vessels for a time, but are intolerant of prolonged interactions with swimmers and/or vessels. Swimming, snorkeling, kayaking, motor-boating noted here.	Yes = Area acknowledged as a primary resting spot based on several publications and multiple surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
	Timmel thesis 2005	Dolphins present 67% of the time and refers to area as critical. Mean group size 30, with a range from 11-50 animals. In a band b/w 50-500m from shore in all but the SE quarter of the bay. Most protected part of the bay. Never near Nāpōʻopoʻo pier, where human presence is high.	Dolphin behavior changes recorded as a result of disturbance including altering course, and dividing into smaller subgroups. Dolphins' reorientation and pod linearity index (directness of travel) were impacted. Swimming, snorkeling, kayaking, and motor boats noted here.		

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Kealakekua Bay (Continued)	Take Tompson (NOAA OLE);personal communication		NOAA OLE officers report receiving approximately 25 complaints about dolphin disturbances a year at this site.	Yes = Area acknowledged as a primary resting spot based on several publications and multiple surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.
Keauhou Cove	Norris & Dohl 1980	Dolphins reported as consistently found here. Small group size reported as 20-25 animals.		Maybe = Area acknowledged to be a consistent site for spinner dolphin rest in 1980; however, recent publications fail to acknowledge area.	No = No information reported regarding human disturbance at this site.
	Norris *et al*. 1994	Use of area does not appear regular, based on year-long biweekly aerial survey efforts. Groups observed ranged from 51-100 animals.			
Kehena Beach	Sepez 2006	Dolphins presence noted as intermittent.	Beach based swims noted here. Road into area is rough and so are water conditions at times.	Maybe = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area, but numbers and presence are not well documented.	Maybe = Intensity of dolphin disturbance at this site is not well known.
	Ostman-Lind *et al*. 2004	Researchers identified this area as critical.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance?**
Kehena Beach (Continued)	J. LeFors (NMFS Staff) pers. observation	Has observed spinner dolphins at this site. Known by locals as "Dolphin Beach".	Swimmers from shore, mainly local residents, come here on regular basis. Water is very rough so tourists probably would not attempt swimming here. Was told that there can be several hundred people here on weekends.	Maybe = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area, but numbers and presence are not well documented.	Maybe = Intensity of dolphin disturbance at this site is not well known.
Kīholo Point	Norris & Dohl 1980	Largest groups, 200-250 animals, identified as centered at Keahole Point, but ranging from Honokōhau to Kīholo Bay. From Honokōhau to Kīholo Bay dolphins do not appear to occupy small coves consistently, rather they congregate over the extensive area of shallow water, moving back and forth.		Maybe = Area acknowledged to be a consistent site for spinner dolphin rest in 1980.	No = No information reported regarding human disturbance at this site.
Kua Bay	Sepez 2006	Mentioned as a place spinner dolphins are found, but no numbers or frequency of occurrence indicated.	Mentioned as a destination for vessels leaving Kailua-Kona but little information is provided regarding dolphin interaction.	No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = Not enough information regarding human interaction at this site to determine intensity.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Laupāhoehoe	Norris *et al*. 1994	Use of area does not appear regular, based on year long biweekly aerial survey efforts. Specific size of group observed not reported but indicated as greater than 100 animals.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Leleiwi	Ostman-Lind *et al*. 2004	Researchers refer to area as secondary resting habitat.		No = Information indicates that this may be a secondary resting site for spinner dolphins; there is no information to indicate it as a primary resting site.	No = No information reported regarding human disturbance at this site.
Mahai'ula and Makalawena	J. Viezbicke (HIHWNMS), personal communication, September 29, 2008		Tour boats from Honokōhau Harbor bring guests here to swim with dolphins.	Maybe = Dolphins are known to use this site but usually continue south to Makako Bay after briefly resting here.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Makako Bay (Hoʻona Bay)	Norris *et al*. 1994	Eight groups of dolphins observed across a year of biweekly aerial survey efforts. Groups size ranged from 1-50; 51-100 and 100+		Yes = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. This bay is likely the best known area for tour boats bringing snorkelers to interact with spinner dolphins on the Island of Hawaiʻi.
	Sepez 2006	Mentioned as a place spinner dolphins are found, but no numbers or frequency of occurrence indicated.	Dolphin tours from Kailua-Kona head to this spot.		
	Norris *et al*. 1994 (refers to it as Hoʻona Bay)	Dolphin use of this site appeared regular based on biweekly aerial survey efforts throughout a year. Frequented by the largest schools of spinners on the entire island. Groups size ranged from 1-50, 51-100,and greater; frequently numbered as many as 180-200 animals.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Makako Bay (Hoʻona Bay) (Continued)	Ostman-Lind *et al*. 2004	Researchers identified this area as critical.	Spinner dolphin displaced to next bay to the north that had only been used occasionally used by dolphins during previous studies.	Yes = Area acknowledged as a primary resting spot based on surveys of dolphin presence in area.	Yes = Multiple sources recognize this site as an area where dolphin disturbance occurs. This bay is likely the best known area for tour boats bringing snorkelers to interact with spinner dolphins on the Island of Hawai'i.
	J. LeFors (NMFS Staff) pers. observation	Has observed groups of 50 to 100 dolphins at this site on several site visits.	Observed 4 tour boats converging on dolphin pod and dropping swimmers in the water with dolphins. Dolphins behavior changed as a result; dolphins split into two groups, one group entering deeper into bay while the other group moved farther offshore.		
Māhukona (Just South)	Norris *et al*. 1994	Five dolphins groups observed across a year of biweekly aerial survey efforts. Group size ranged from 1-50; 51-100 and greater than 100.		Maybe = Norris *et al*. report sightings across a year, but current publications do not recognize this area as a resting area specifically.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Manukā Bay	Ostman-Lind *et al*. 2004	Researchers indicated this site as a probable resting site for dolphins.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
	C. Leslie (Local Fisherman), personal communication, October 2, 2008	Dolphins noted as recently using this area. In the past they did not to see dolphins resting this far south.			
Miloli'i	Norris & Dohl 1980	A single record of 20 animals (not well surveyed because this was a no fly area during part of the study).		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins	No = No information reported regarding human disturbance at this site.
	Sepez 2006	Mentioned as a place spinner dolphins are found, but no numbers or frequency of occurrence indicated.			
	G. Kahele (Lifelong resident of Miloli'i), personal communication, June 28, 2007	Spinner dolphins have been observed here.			

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Okoe Bay	Ostman-Lind *et al*. 2004	Researchers indicated this site as a probable resting site for dolphins.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
	G. Kahele (Lifelong resident of Miloli'i), personal communication, June 28, 2007	Spinner dolphins have been observed here.			
	Norris *et al*. 1994	Four groups observed across 8 months, during a biweekly aerial survey effort that spanned a year. Exact number not recorded but may range from 1-50 animals.			
Opilukao Cove	Norris & Dohl 1980	Sometimes dolphins observed here from "home bay" on southern edge of the cape.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Puakō	Ostman-Lind *et al*. 2004	Researchers identified this area as secondary resting habitat.		No = Information indicates that this may be a secondary resting site for spinner dolphins; there is no information to indicate it as a primary resting site.	No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Pu‘u Kuili (and areas just north)	Norris *et al*. 1994	Six groups observed across 9 months of biweekly aerial survey efforts that spanned a year. Groups size ranged from 1-50; 51-100 and greater than 100.		Maybe = Norris *et al*. report sightings across a year, but current publications do not recognize this area as a resting area specifically.	No = No information reported regarding human disturbance at this site.
South Pt	Norris & Dohl 1980	Small groups of approximately 20 animals observed here. Located in very rough water between Ka Lae and Honu‘apo, over the modestly developed shallow area or occasionally in the deep cove at Ka‘alu‘alu.		No = Area is large and covers multiple inlets. Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	
	Norris *et al*. 1994	Eight groups recorded in and around the South Point area in 8 months of the year, during a biweekly aerial survey effort that spanned a year. Groups reported range in size from 1-50 to 51-100 animals.			No = No information reported regarding human disturbance at this site.

Table A-2. Step 1 and Step 2 (continued)

Table A-2 - Resting Sites on Hawai'i					
Sites	**Reference**	**Information Regarding Dolphin Use of Area**	**Information Regarding Human Disturbance in Area**	**Should the area be considered essential daytime habitat?**	**Does this area require enhanced protection from human disturbance for spinner dolphins?**
Waikoloa Beach	Sepez 2006	Dolphins arrival to this spot noted as recent, but no numbers or frequency of occurrence indicated.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.
Waipí o Valley Bay	Sepez 2006	Mentioned as a place spinner dolphins are found, but no numbers or frequency of occurrence indicated.		No = Not enough information regarding spinner use of site to determine that this is an essential daytime habitat for spinner dolphins.	No = No information reported regarding human disturbance at this site.

Table A-3. Step 3 – Summary of evaluation criteria for an effective closure using the 12 highlighted bays from Table A-2 (*i.e.*, targeted essential daytime habitats). The five bays selected for time-area closures (highlighted in light blue) were areas where "yes" was answered for a majority of the criteria and "no" was not answered for any criteria.

Table A-3 - Closure Evaluation Criteria					
Sites	**Do environmental conditions support a discrete closure?**	**Closure does not obstruct a major harbor or transit zone**	**Are there alternative areas nearby that are accessible for human use?**	**Is enforcement more readily available for the site?**	**Can the area fit into the Adaptive Management Strategy (Is Monitoring logistically feasible)?**
Nāpali Coast (Kauaʻi)	No = Dolphins seem to transit along this coastline resting in various areas, making discrete closure areas difficult to identify.	Yes = No major harbor or transit area is identified for close coastal areas.	No = Area is expansive and a major destination for scenic tours of Kauaʻi.	No = The remote nature of this coastline requires transit out to and along the expansive area. A fulltime staff member would need to be devoted to the area on a regular basis to effectively patrol. Logistically this may not be an option with current staff and resource limitations.	No = Access to dolphin observations are restricted mainly to boating along this coast. The costs of gaining information at this site are not feasible with limited resources.
Waiʻanae Coast (includes Kahe Point, Mākua Bay, Pōkaʻī Bay, and Yokohama Bay) (Oʻahu)	No = Dolphins are known to transit along this coastline resting in various areas, making discrete closure areas difficult to delineate.	No = Three harbors exist within this stretch: Waiʻanae Small Boat Harbor, Kalaeloa Barbers Point Harbor, and Ko'olina Marina.	No = Area is expansive and includes harbors, recreational fishing area, major transit areas, and areas used by DOD for training.	Yes = Enforcement staff may easily access areas frequented by residents and Hawaiʻi's visitors to provide enforcement of closure areas. However, an expansive closure may require more enforcement effort to effectively patrol.	Yes = Multiple areas along this coastline provide harbors for launching vessels for research staff and various areas along the coast may provide for land based surveys. However, an expansive closure and the behavior of dolphins along this coastline (moving along the expanse) may present a challenge to research staff.

Table A-3. Step 3 – Summary of evaluation criteria – Continued.

Table A-3 - Closure Evaluation Criteria					
Sites	**Do environmental conditions support a discrete closure?**	**Closure does not obstruct a major harbor or transit zone**	**Are there alternative areas nearby that are accessible for human use?**	**Is enforcement more readily available for the site?**	**Can the area fit into the Adaptive Management Strategy (Is Monitoring logistically feasible)?**
La Perouse Bay (Maui)	Yes = A discrete area of the bay may be sectioned off to identify the spinner protection zone.	Yes = No major harbor or transit area is identified, but a private boat ramp exists shoreward of the closure.	Yes = Maui's coastline provides multiple areas with accessibility for recreational activities on the water. Additional considerations may be made to allow landowners transit access.	Yes = Enforcement staff may easily access areas frequented by residents and Maui's visitors to provide enforcement of closure areas.	Maybe = Access to this site is feasible; however, the site is not nearby multiple sites for ease of observation. Volunteers at this site may be able to provide data regarding dolphin use of the area as they have done in years past.
Hulopó e Bay (Lānáʻi)	Maybe = A discrete area of the bay may be sectioned off to identify the spinner protection zone, however more information may be necessary to determine the area used most by dolphins.	Yes = No major harbor or transit area is identified.	No = Residents have identified that the Bay provides the only easily accessible site on Island for ocean recreation since other sites require a 4-wheel drive vehicle.	No = Limited enforcement resources limits the amount of enforcement presence on smaller islands such as Lānaʻi. A fulltime staff member would need to be devoted to the area on a regular basis to effectively patrol. Logistically this may not be an option with current staff and resource limitations.	Maybe = Access for dolphin observations appear to be relatively easy for a researcher that is based on Lānaʻi; however, the costs for these efforts may be higher than other sites and a researcher stationed on Lānaʻi may be limited to just the one site.

Table A-3. Step 3 – Summary of evaluation criteria – Continued.

Table A-3 - Closure Evaluation Criteria					
Sites	**Do environmental conditions support a discrete closure?**	**Closure does not obstruct a major harbor or transit zone**	**Are there alternative areas nearby that are accessible for human use?**	**Is enforcement more readily available for the site?**	**Can the area fit into the Adaptive Management Strategy (Is Monitoring logistically feasible)?**
Hōnaunau Bay (Hawai'i)	Yes = A discrete area of the bay may be sectioned off to identify the spinner protection zone.	Yes = A boat ramp exists at this site, but the closure area would not infringe on transit to and from the boat ramp.	Yes = Hawai'i's coastline provides multiple areas with accessibility for recreational activities on the water. Additionally consideration may be taken to delineate the area to allow for continued use of the boat ramp.	Yes = Enforcement staff may easily access areas frequented by residents and Hawai'i's visitors to provide enforcement of closure areas.	Yes = Bays easily accessible to Hawai'i's residents and visitors should be easily accessible for research staff. Proximity of other areas may allow multiple bays to be accessed for research observations.
Honokōhau Harbor (Hawai'i)	No = Observations indicate dolphins are using a discrete area; however, this area overlaps with the harbor entrance and the boat channel.	No = This area is a harbor and a closure might obstruct navigation.	No = There is a limited amount of harbor space available to boaters on the island, and removal of access to this harbor would impact this area.	Yes = Enforcement staff may easily access areas frequented by residents and Hawai'i's visitors to provide enforcement of closure areas.	Yes = Bays easily accessible to Hawai'i's residents and visitors should be easily accessible for research staff. Proximity of other areas may allow multiple bays to be accessed for research observations.

Table A-3. Step 3 – Summary of evaluation criteria – Continued.

Table A-3 - Closure Evaluation Criteria					
Sites	**Do environmental conditions support a discrete closure?**	**Closure does not obstruct a major harbor or transit zone**	**Are there alternative areas nearby that are accessible for human use?**	**Is enforcement more readily available for the site?**	**Can the area fit into the Adaptive Management Strategy (Is Monitoring logistically feasible)?**
Kailua Bay (Hawai'i)	No = Observations indicate dolphins are using a discrete area; however, this area overlaps with the harbor.	No = This area is a harbor and a closure might obstruct navigation.	No = There is a limited amount of harbor space available to boaters on the island, and removal of access to this harbor would impact this area.	Yes = Enforcement staff may easily access areas frequented by residents and Hawai'i's visitors to provide enforcement of closure areas.	Yes = Bays easily accessible to Hawai'i's residents and visitors should be easily accessible for research staff. Proximity of other areas may allow multiple bays to be accessed for research observations.
Kauhakō Bay (Hó okena) (Hawai'i)	Yes = A discrete area of the bay may be sectioned off to identify the spinner protection zone.	Yes = No major harbor or transit area is identified, but traditional canoes are launched from shore.	Yes = Hawai'i's coastline provides multiple areas with accessibility for recreational activities on the water. Additionally consideration may be taken to delineate the area to allow for continued use of the area for akule fishing.	Yes = Enforcement staff may easily access areas frequented by residents and Hawai'i's visitors to provide enforcement of closure areas.	Yes = Bays easily accessible to Hawai'i's residents and visitors should be easily accessible for research staff. Proximity of other areas may allow multiple bays to be accessed for research observations.

Table A-3. Step 3 – Summary of evaluation criteria – Continued.

Table A-3 - Closure Evaluation Criteria					
Sites	**Do environmental conditions support a discrete closure?**	**Closure does not obstruct a major harbor or transit zone**	**Are there alternative areas nearby that are accessible for human use?**	**Is enforcement more readily available for the site?**	**Can the area fit into the Adaptive Management Strategy (Is Monitoring logisitically feasible)?**
Kealakekua Bay (Hawai'i)	Yes = A discrete area of the bay may be sectioned off to identify the spinner protection zone.	Yes = A boat ramp exists at this site, but the closure area would not infringe on transit to and from the boat ramp.	Yes = Hawai'i's coastline provides multiple areas with accessibility for recreational activities on the water. Additionally consideration may be taken to delineate the area to allow recreationalists to swim along the shoreline or to visit the Captain Cook Monument via vessel.	Yes = Enforcement staff may easily access areas frequented by residents and Hawai'i's visitors to provide enforcement of closure areas.	Yes = Bays easily accessible to Hawai'i's residents and visitors should be easily accessible for research staff. Proximity of other areas may allow multiple bays to be accessed for research observations.
Kehena Beach (Hawai'i)	Maybe = More information is needed to determine which part of the bay is used for resting. Observations were made of the dolphins resting just off the mouth of the bay.	Yes = No major harbor or transit area is identified.	Yes = Hawai'i's coastline provides multiple areas for recreational activities on the water.	No = Remote location far from main town of Hilo and far from other resting sites make enforcement problematic here.	No = Remote location far from main town of Hilo and far from other resting sites make research activities problematic here.

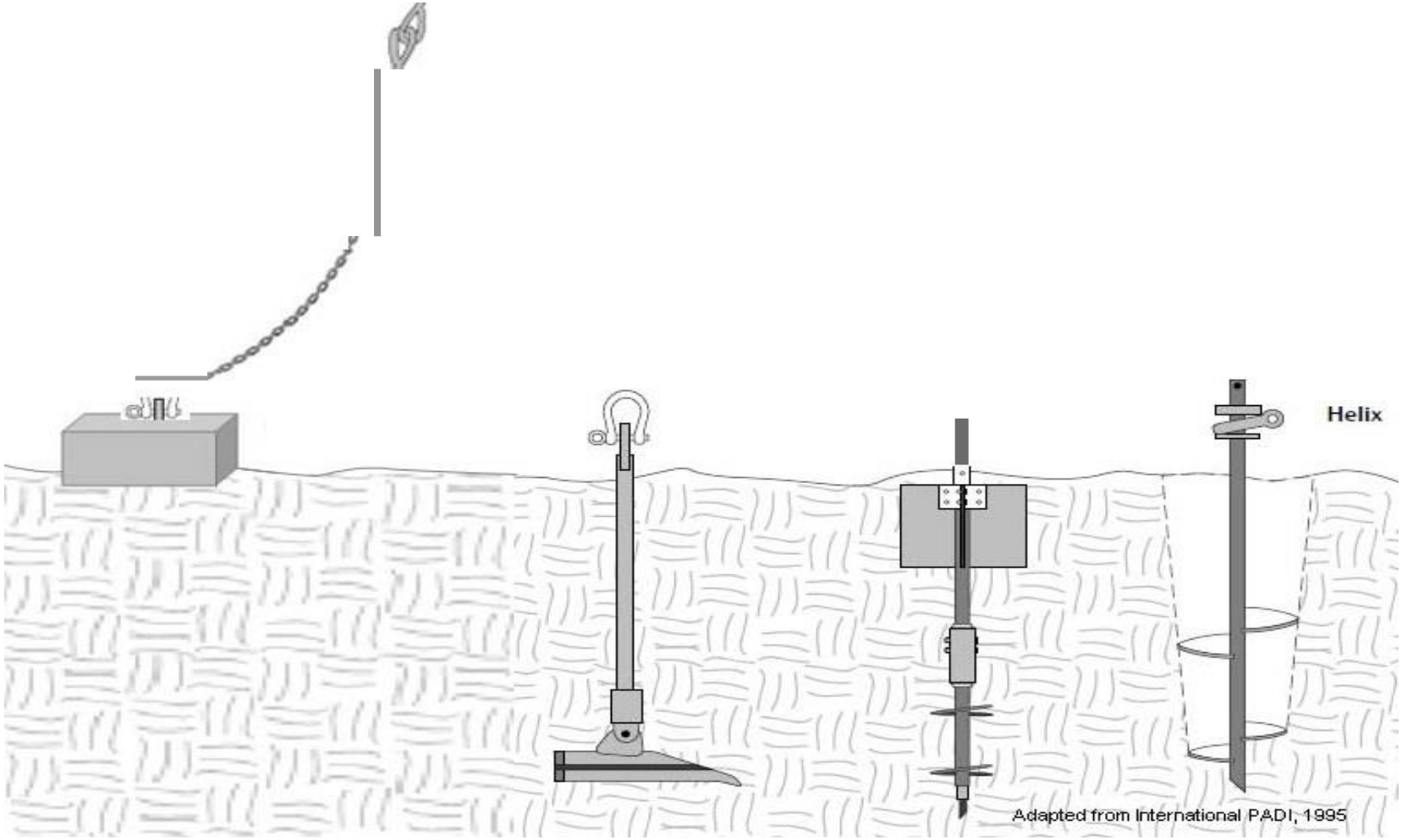
Table A-3. Step 3 – Summary of evaluation criteria – Continued.

Table A-3 - Closure Evaluation Criteria					
Sites	**Do environmental conditions support a discrete closure?**	**Closure does not obstruct a major harbor or transit zone**	**Are there alternative areas nearby that are accessible for human use?**	**Is enforcement more readily available for the site?**	**Can the area fit into the Adaptive Management Strategy (Is Monitoring logisitically feasible)?**
Mahai'ula and Makalawena (Hawai'i)	No = Dolphins seem to transit through this area, stopping briefly to rest before heading south to Makako Bay. No distinct bay formation to easily delineate.	Yes = No major harbor or transit area is identified.	Yes = Hawai‘i's coastline provides multiple areas for recreational activities on the water.	Maybe = Access is via a long, rough lava road which is only open after 9AM, followed by a long walk; alternate access road is only accessible to 4-wheel drive vehicles . Enforcement presence would not be possible at all times and would not be able to arrive quickly if violation is reported.	Maybe = Access is via a long, rough lava road which is only open after 9AM, followed by a long walk; alternate access road is only accessible to 4-wheel drive vehicles .
Makako Bay (including Ho‘ona Bay) (Hawai'i)	Yes = A discrete area of the bay may be sectioned off to identify the spinner protection zone.	Yes = No major harbor or transit area is identified.	Yes = Hawai‘i's coastline provides multiple areas with accessibility for recreational activities on the water. Additionally, manta ray dive sites are popular in early evening and would still be accessible after the 3pm closure time ends.	Yes = Enforcement staff may easily access areas frequented by residents and Hawai‘i's visitors to provide enforcement of closure areas.	Yes = Bays easily accessible to Hawai‘i's residents and visitors should be easily accessible for research staff. Proximity of other areas may allow multiple bays to be accessed for research observations.

Table A-4. Areas selected for time-area closures. See Table A-3 for full answers to the questions for each bay.

Table A-4 - Areas Selected for Time-Area Closures					
Sites	**Do environmental conditions support a discrete closure?**	**Closure does not obstruct a major harbor or transit zone**	**Are there alternative areas nearby that are accessible for human use?**	**Is enforcement more readily available for the site?**	**Can the area fit into the Adaptive Management Strategy (Is Monitoring logistically feasible)?**
La Perouse Bay (Maui)	Yes	Yes	Yes	Yes	Maybe
Hōnaunau Bay (Hawai'i)	Yes	Yes	Yes	Yes	Yes
Kauhakō Bay/ Hó okena (Hawai'i)	Yes	Yes	Yes	Yes	Yes
Kealakekua Bay (Hawai'i)	Yes	Yes	Yes	Yes	Yes
Makako Bay (including Hoʻona Bay) (Hawai'i)	Yes	Yes	Yes	Yes	Yes

Appendix B – Buoy Depictions


Helix
Adapted from International PADI, 1995

Appendix C – Best Management Practices for In- and Near-Water Work

Best Management Practices (BMPs) for General In- and Near-Water Work Including Boat and Diver Operations

April 2013

NMFS Protected Resources Division recommends implementation of the following BMPs to reduce potential adverse effects on protected marine species. These BMPs are in no way intended to supersede or replace measures required by any other agency including, but not limited to the ACOE, USFWS, USEPA, or NMFS Habitat Conservation Division, and compliance with these BMPs shall always be considered secondary to safety concerns.

All workers associated with this project, irrespective of their employment arrangement or affiliation (*e.g*. employee, contractor, etc.) shall be fully briefed on these BMPs and the requirement to adhere to them for the duration of their involvement in this project.

A. Constant vigilance shall be kept for the presence of ESA-listed marine species during all aspects of the proposed action, particularly in-water activities such as boat operations, diving, and deployment of anchors and mooring lines.

1. The project manager shall designate an appropriate number of competent observers to survey the areas adjacent to the proposed action for ESA-listed marine species.
2. Surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour. Periodic additional surveys throughout the workday are strongly recommended.
3. All work shall be postponed or halted when ESA-listed marine species are within 50 yards of the proposed work, and shall only begin/resume after the animals have voluntarily departed the area. If ESA-listed marine species are noticed within 50 yards after work has already begun, that work may continue only if, in the best judgment of the project supervisor, there is no potential for the activity to adversely affect the animal(s). For example, divers performing surveys or underwater work would likely be permissible, whereas operation of heavy equipment is likely not.
4. Special attention will be given to verify that no ESA-listed marine animals are in the area where equipment or material is expected to contact the substrate before that equipment/material may enter the water.
5. All objects will be lowered to the bottom (or installed) in a controlled manner. This can include the use of buoyancy controls such as lift bags, or the use of cranes, winches, or other equipment that effect positive control over the rate of descent.
6. In-water tethers, as well as mooring lines for vessels and marker buoys, shall be kept to the minimum lengths necessary, and shall remain deployed only as long as needed to properly accomplish the required task.
7. When piloting vessels, operators shall alter course to remain at least 100 yards from whales, and at least 50 yards from other marine mammals and sea turtles.
8. Reduce vessel speed to 10 knots or less when piloting vessels at or within the ranges described above from marine mammals and sea turtles. Operators shall be particularly vigilant to watch for turtles at or near the surface in areas of known or suspected turtle activity, and if practicable, reduce vessel speed to 5 knots or less.

9. If, despite efforts to maintain the distances and speeds described above, a marine mammal or turtle approaches the vessel, put the engine in neutral until the animal is at least 50 feet away, and then slowly move away to the prescribed distance.
10. Marine mammals and sea turtles shall not be encircled or trapped between multiple vessels or between vessels and the shore.
11. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

B. No contamination of the marine environment shall result from project-related activities.

12. A contingency plan to control toxic materials is required.
13. Appropriate materials to contain and clean potential spills shall be stored at the work site and be readily available.
14. All project-related materials and equipment placed in the water shall be free of pollutants.
15. The project manager and heavy equipment operators shall perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
16. Fueling of land-based vehicles and equipment shall take place at least 50 feet away from the water, preferably over an impervious surface. Fueling of vessels shall be done at approved fueling facilities.
17. Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion control practices, effective silt containment devices, and the curtailment of work during adverse weather and tidal/flow conditions.
18. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

Appendix D – Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) Designations for Hawai‘i

EFH and HAPC Designations for the Hawai‘i Archipelago Fishery Ecosystem Plan Management Unit Species (MUS)

MUS	Species Complex	EFH	HAPC
Bottomfish and Seamount Groundfish	**Shallow-water species (0–50 fm):** uku (*Aprion virescens*), thicklip trevally (*Pseudocaranx dentex*), giant trevally (*Caranx ignoblis*), black trevally (*Caranx lugubris*), amberjack (*Seriola dumerili*), taape (*Lutjanus kasmira*)	**Eggs and larvae:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm). **Juvenile/adults:** the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm).	All slopes and escarpments between 40–280 m (20 and 140 fm). Three known areas of juvenile opakapaka habitat: two off O‘ahu and one off Molokai.
Bottomfish and Seamount Groundfish	**Deep-water species (50–200 fm):** ehu (*Eteliscarbunculus), onaga (Etelis coruscans), opakapaka (Pristipomoides filamentosus), yellowtail kalekale (P. auricilla), kalekale (P. sieboldii), gindai (P. zonatus), hapuupuu (Epinephelus quernus), lehi (Aphareus rutilans)*	**Eggs and larvae:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fathoms). **Juvenile/adults:** the water colun and all bottom habitat extending from the shoreline to a depth of 400 meters (200 fm).	All slopes and escarpments between 40–280 m (20 and 140 fm). Three known areas of juvenile opakapaka habitat: two off O‘ahu and one off Molokai.
Bottomfish and Seamount Groundfish	**Seamount groundfish species (50–200 fm):**armorhead (*Pseudopentaceros richardsoni*), ratfish/butterfish (*Hyperoglyphe japonica*), alfonsin (*Beryx splendens*)	**Eggs and larvae:** the (epipelagic zone) water column down to a depth of 200 m (100 fm) of all EEZ waters bounded by latitude 29°–35°. **Juvenile/adults:** all EEZ waters and bottom habitat bounded by latitude 29°–35° N and longitude 171° E–179° W between 200 and 600 m (100 and 300 fm).	No HAPC designated for seamount groundfish.

EFH and HAPC Designations for the Hawai‘i Archipelago Fishery Ecosystem Plan Management Unit Species (MUS) Continued…

MUS	Species Complex	EFH	HAPC
Crustaceans	**Spiny and slipper lobster complex:** Hawaiian spiny lobster (*Panulirus marginatus*), spiny lobster (*P. penicillatus, P. spp.*), ridgeback slipper lobster (*Scyllarides haanii*), Chinese slipper lobster (*Parribacus antarcticus*) **Kona crab:** Kona crab (*Ranina ranina*)	**Eggs and larvae:** the water column from the shoreline to the outer limit of the EEZ down to a depth of 150 m (75 fm). **Juvenile/adults:** all of the bottom habitat from the shoreline to a depth of 100 m (50 fm).	All banks in the NWHI with summits less than or equal to 30 m (15 fathoms) from the surface.
Crustaceans	**Deepwater shrimp (***Heterocarpus spp.***)**	**Eggs and larvae:** the water column and associated outer reef slopes between 550 and 700 m. **Juvenile/adults:** the outer reef slopes at depths between 300–700 m.	No HAPC designated for deep-water shrimp.

EFH and HAPC Designations for the Hawai‘i Archipelago Fishery Ecosystem Plan Management Unit Species (MUS) Continued…

MUS	Species Complex	EFH	HAPC
Precious Corals	**Deep-water precious corals (150–750 fm):** Pink coral (*Corallium secundum*), red coral (*C. regale*), pink coral (*C. laauense*), midway deepsea coral (*C. sp nov.*), gold coral (*Gerardia spp.*), gold coral (*Callogorgia gilberti*), gold coral (*Narella spp.*), gold coral (*Calyptrophora spp.*), bamboo coral (*Lepidisis olapa*), bamboo coral (*Acanella spp.*) **Shallow-water precious corals (10-50 fm):** Black coral (*Antipathes dichotoma*), black coral (*Antipathis grandis*), black coral (*Antipathes ulex*)	EFH for Precious Corals is confined to six known precious coral beds located off Keahole Point, Makapuu, Ka‘ena Point, Wespac bed, Brooks Bank, and 180 Fathom Bank. EFH has also been designated for three beds known for black corals in the MHI between Miloli‘i and South Point on the Big Island, the ‘Au‘au Channel, and the southern border of Kaua‘i. Includes the Makapuu bed, Wespac bed, Brooks Banks bed.	For Black Corals, the ‘Au‘au Channel has been identified as a HAPC.
Coral Reef Ecosystems	**All Currently Harvested Coral Reef Taxa** **All Potentially Harvested Coral Reef Taxa**	EFH for the Coral Reef Ecosystem MUS includes the water column and all benthic substrate to a depth of 50 fm from the shoreline to the outer limit of the EEZ.	Includes all no-take MPAs identified in the CRE-FMP, all Pacific remote islands, as well as numerous existing MPAs, research sites, and coral reef habitats throughout the western Pacific.

Appendix E – List of Protected Marine Species in Hawai‘i

Species protected under the Endangered Species Act in Hawai‘i

Species	Scientific Name	ESA Status	Listing Date	Federal Register Reference
Hawaiian monk seal	*Neomonachus schauinslandi*	Endangered	11/23/1976	41 FR 51612
Green Sea Turtle (Central North Pacific DPS)[1]	*Chelonia mydas*	Threatened	7/28/1978 04/06/2016	43 FR 32800 81 FR 20058
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered	7/28/1978	43 FR 32800
Loggerhead Sea Turtle	*Caretta caretta*	Threatened	7/28/1978	43 FR 32800
Olive Ridley Sea Turtle	*Lepidochelys olivacea*	Threatened	7/28/1978	43 FR 32800
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered	6/2/1970	35 FR 8491
Humpback Whale	*Megaptera novaeangliae*	Endangered	12/2/1970	35 FR 18319
Blue Whale	*Balaenoptera musculus*	Endangered	12/2/1970	35 FR 18319
Fin Whale	*Balaenoptera physalus*	Endangered	12/2/1970	35 FR 18319
Sei Whale	*Balaenoptera borealis*	Endangered	12/2/1970	35 FR 18319
Sperm Whale	*Physeter macrocephalus*	Endangered	12/2/1970	35 FR 18319
MHI Insular False Killer Whale DPS	*Pseudorca crassidens*	Endangered	11/28/2012	77 FR 70915
Giant Manta Ray	*Manta birostris*	Threatened	2/21/2018	83 FR 2916

[1] The 1978 green sea turtle listing was recently revised and green sea turtles were listed as 11 threatened or endangered Distinct Population Segments (DPSs); Hawaii's population falls within the Central North Pacific DPS.

Species Protected under the Marine Mammal Protection Act in Hawai‘i

Species	Scientific Name
Hawaiian Monk Seal	*Neomonachus schauinslandi*
Rough-Toothed Dolphin	*Steno bredanensis*
Risso’s Dolphin	*Grampus griseus*
Common Bottlenose Dolphin	*Tursiops truncatus truncatus*
Pantropical Spotted Dolphin	*Stenella attenuata attenuata*
Spinner Dolphin	*Stenella longirostris longirostris*
Striped Dolphin	*Stenella coeruleoalba*
Fraser’s Dolphin	*Lagenodelphis hosei*
Melon-Headed Whale	*Peponocephala electra*
Pygmy Killer Whale	*Feresa attenuate*
False Killer Whale	*Pseudorca crassidens*
Killer Whale	*Orcinus orca*
Short-Finned Pilot Whale	*Globicephala macrorhynchus*
Blainville’s Beaked Whale	*Mesoplodon densirostris*
Cuvier’s Beaked Whale	*Ziphius cavirostris*
Longman’s Beaked Whale	*Indopacetus pacificus*
Pygmy Sperm Whale	*Kogia breviceps*
Dwarf Sperm Whale	*Kogia sima*
Sperm Whale	*Physeter macrocephalus*
Blue Whale	*Balaenoptera musculus*
Fin Whale	*Balaenoptera physalus*
Bryde’s Whale	*Balaenoptera edeni*
Sei Whale	*Balaenoptera borealis*
Minke Whale	*Balaenoptera acutorostrata scammoni*
Humpback Whale	*Megaptera novaeangliae*

Appendix F – Economic Data Report

ECONOMIC DATA REPORT

A Technical Report Supporting of Analysis of

NOAA Fisheries Proposed Rule and Environmental Impact Statement:
Enhancing Protections for Hawaiian Spinner Dolphins to Prevent Disturbance

Prepared for the

U.S. Department of Commerce
NOAA Fisheries
Pacific Islands Regional Office
Protected Resources Division

by

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Executive Summary

Overview. The data that are the focus of this report relate to economic and operational aspects of businesses that facilitate or opportunistically offer encounters with Hawaiian spinner dolphins (*Stenella longirostris*) in the Main Hawaiian Islands (MHI). These data and related narrative are intended to assist NOAA Fisheries Pacific Islands Regional Office as it finalizes its assessment of potential regulatory effects on tour operations and other sources of disturbance to spinner dolphin populations in the MHI. The report updates and revises a similar data collection effort undertaken in 2007. Inasmuch as spatial regulations currently proposed by NOAA could most directly impact businesses that intentionally facilitate close-proximity underwater encounters with dolphins, the current data collection process was focused primarily on such operations at their principal staging areas along the leeward coastlines of O'ahu and Hawai'i Island.

Subsidiary focus was applied to tour operations that opportunistically provide patrons with vessel-based dolphin encounters along the West Maui coastline and along the Nā Pali coastline of Kaua'i.

Methodology. A social network sampling approach was used to identify business owners and operators who purposely or opportunistically facilitate dolphin encounters in the MHI.

[1]Information about the businesses was collected using in-depth interview and ethnographic research methods between June and September 2017. Network-based sampling and primary source research were the only viable options for gathering detailed business information, since access to relevant archival data maintained by Hawai'i agencies requires time-consuming data sharing agreements, and such data do not clearly differentiate spinner dolphin viewing from other commercial tour activities. Seasoned and highly proficient applied social scientists developed and implemented a systematic field research protocol to guide the in-depth interview process.

Sampling Frame, Sample, and Data Limitations. A total of 126 persons were interviewed during the study, some numerous times. The social network sampling portion of the interviews led to identification of 101 tour operations known to facilitate close-proximity underwater dolphin encounters along the leeward coastlines of Hawai'i Island and O'ahu – such tours do not occur around the remainder of the MHI. A total of 56 owners or operators of underwater tours were interviewed, as were an additional 38 owners or operators of tours that intentionally or opportunistically provide dolphin viewing opportunities while aboard tour vessels along leeward Maui and the Nā Pali coastline of Kaua'i. The vast majority of interviewees were owners or operators of single operations; relatively few business entities own more than one tour vessel.[2]

Interviewees involved in the study were fully informed of the purpose of the study, gave informed consent to proceed, and provided various forms of useful information. Despite repeated assurances that all identifiers would be removed, and all data sufficiently aggregated to safeguard individual owners and operators, relatively few interviewees were willing to provide the full range of requested information about their businesses. This is common in a study setting

[1] The phrases 'dolphin encounters' and 'dolphin interactions' are used interchangeably in this document.

[2] For instance, a total of 41 business entities operated the 47 identified underwater spinner dolphin tours active along West Hawai'i. All spiritual retreats in the region are operated as discrete business entities. All eight underwater spinner dolphin tours active along Leeward O'ahu are individually owned.

where competition between businesses is often intense and where interviewees fear that proprietary information could be used to design and implement regulations that constrain their chances for success. Data tables provided in this report therefore indicate the number of interviewees providing usable information for each inquiry or variable (sample size is expressed as 'n' = x).

Basic Findings. Three principal types of for-profit operations were observed to be purposely or opportunistically facilitating spinner dolphin encounters in the MHI during the summer months of 2017. These are: (Type 1) commercial boat tours that focus on intentionally providing close-proximity underwater viewing of dolphins (also known as swim-with-dolphin operations); (Type 2) tours that focus on facilitation of spiritually oriented underwater interactions with dolphins – using a boat for transport and staging, or staging from the shoreline, for certain operations; and (Type 3) boat-based tours that opportunistically provide dolphin viewing experiences from the vessel, as one of an array of other activities, such as reef snorkeling, paddle-boarding, dining, cruising, and so forth. Some such operations use the possibility of dolphin viewing as part of their business strategy.

Operation Type 1 openly occurs only along: (a) the Kona side of Hawai'i Island; and (b) Leeward O'ahu. Up-close underwater viewing of, or interaction with, dolphins using a mask, snorkel, and fins is central to this type of operation.

Operation Type 2 occurs exclusively along the Kona side of Hawai'i Island. Mask and fin-assisted viewing of dolphins in close underwater proximity is fundamental to this type of operation as well, with the encounter itself typically involving some form of underwater communing or spiritual connection with spinner dolphins.

Operation Type 3 occurs throughout the study islands, although this report describes such tours only as they are conducted from leeward Maui and along the Nā Pali coastline of Kaua'i. Some owners and operators in this group assert that dolphin viewing is an important part of their overall commercial boat tour advertising strategy, though all such tours provide and often emphasize a wider variety of ocean recreation and sightseeing services. Many, but not all commercial tour operators in this category reportedly attempt to maintain a 50 yard buffer when encountering spinner dolphins, as recommended by the NOAA Dolphin SMART program. This is not always possible given varying dolphin behavior and the fact that spinner dolphins sometimes ride the wakes of transiting vessels.

It should be noted that among operations that provide a dolphin viewing experience for patrons from aboard a tour vessel (Type 3), differences between 'purposive' and 'opportunistic' are not always perfectly clear. Dolphins can be an important part of the tour experience and are often nearby as the generalized tour operation transits or visits certain areas. But this is not always the case, and other recreational or sightseeing activities can keep patrons satisfied. In contrast, operations that intentionally facilitate close-proximity underwaters interactions with spinner dolphins (Types 1 and 2) are far more dependent on the presence of the cetaceans and consistently seek them out in specific areas. The underwater interaction between patrons and dolphins is the principal focus of these operations.

The number of facilitated underwater dolphin tours along the Kona side of Hawai'i Island in 2017 was notably higher than when the previous spinner dolphin-human interaction data report

was compiled in 2007. This is true for both commercial boat tours that facilitate close-proximity underwater viewing of dolphins (Type One), and for tours that focus on providing spiritually oriented underwater encounters with dolphins (Type Two). In 2007, only six commercial tour boat operations were known to be facilitating close-proximity underwater interactions with spinner dolphins along the Kona Coast, while today a total of 47 such operations are known to be active there. Similarly, five spiritual-oriented underwater dolphin tours were known to be openly active along this stretch of coastline in 2007, while 47 such tours were enumerated during the summer months of 2017. However, only eight of the spiritual tours were locally owned and operated in 2017 – the remainder are part of a rapidly growing trend that involves the participation of guides who come to Hawai'i Island to facilitate dolphin-oriented spiritual retreats. Most non-resident guides use the services of local captains, although a few operate from the shoreline.

Various forms of data were collected from business owners and operators during the course of this study, including basic information about the nature and distribution of the operations and select economic information, such as average gross revenue, trip fees, rates of patronage, and other quantifiable attributes. Extensive time and resources were applied during the field phase of the project to achieve good working relationships with, and acquire essential information from, owners/operators who facilitate underwater dolphin encounters. This was deemed logical since these types of businesses are quite likely to be directly impacted by the 50 yard buffer that is being proposed as the principal regulatory strategy for reducing human-induced stress on spinner dolphin populations in the MHI.

A rudimentary indicator of the overall economic value of the operations described in this report for the period 2016-2017 is gross revenue. Notably, the owners/operators of generalized commercial boat tours conducted along the Nā Pali coastline of Kaua'i reported the highest average gross revenue of all groups consulted during the study (>$4,443,000; n=5). Among commercial boat tours facilitating underwater dolphin encounters in the MHI, the highest average gross revenue was documented among operators active along the Leeward Coast of O'ahu. These exceeded $1,918,000 – indicative of the large capacity of the seven vessels involved. Total gross revenue among this group was over $11,511,000 (n=6). Gross revenues reported by commercial boat tours facilitating underwater dolphin encounters along the Kona Coast of Hawai'i Island were much smaller by comparison – just over $245,000 on average – indicative of a larger fleet with highly variable capacities, including numerous small vessels.

Total gross revenue among the 22 responding owners/operators was $5,404,757. Average gross revenue among the spiritual-oriented underwater tours owned by Hawai'i residents (n=6) was nearly $379,000, with total gross revenue totaling $2,273,543. Finally, average gross revenue among non-resident spiritual tour operators (n=8) was $48,576, with reported total gross revenue of just over $388,000.

Consideration of Regulatory Impacts and Policy Development. While it may be tempting to use extrapolated revenues or other economic figures provided in this report to assign an overall value to the spinner dolphin industry, or to components thereof, and to suggest that this value and its contributing components comprise what is ‘at-risk’ from the proposed regulatory changes, this would be a spurious exercise for at least two important reasons.

First, although this report describes basic economic and operational attributes of the principal spinner dolphin tour sectors that could be affected by the proposed spatial buffer, it does not

examine the many and various ways these sectors are linked to the larger local, regional, and state economies. Calculating what is 'at-risk' in the absence of such understanding would cast serious uncertainties on the full measure of regulatory effects and implications. Although this report improves basic understanding of the ways in which spinner dolphin tour operations are linked to and depend on secondary support sectors (such as fuel provisioners, engine and vessel repair shops, and tour brokerages, for examples), detailed analysis of indirect and induced economic linkages and related impacts far exceeded the scope of the study. The full range of economic implications cannot be clearly known without additional in-depth research.

Second, while certain business owners and operators participating in this study provided their perspectives on how they would likely respond to the proposed spatial buffer, it must be kept in mind that such insights were 'captured' at a specific point in time, and with respect to social and economic factors and conditions that may have already shifted. Such perspectives, and indeed the overall study is, in essence, a "snapshot" of conditions, factors, processes, and perspectives reported or observed during a specific point in time; i.e., the summer months of 2017. Moreover, while respondents' thoughts regarding their likely reactions to a spatial buffer provide NOAA with insight into potential scenarios of response and change, such information cannot but be speculative in nature. It cannot yet be known how underwater operators will react in reality.

Some owners or operators may be pre-adapted to a shift in operational emphasis. Some may already be economically stressed and will be unable to adapt. Some may be risk-taskers and ready to try new ideas. Others may be more conservative in approach and/or resistant to change.

An important if obvious point made in this report is that the prospective spatial buffer would indeed lead to significant impacts among the underwater tour sector. Physical realities dictate that the range of good horizontal underwater visibility in Hawaii is typically between 50 and 100 feet (Warlaumont 1991; U.S. Navy Mobile Underwater Salvage Unit, pers. comm., March 2018). This means that a 150-foot buffer would constrain good underwater dolphin viewing and thereby lead the underwater tour businesses in question to alter their operations. At the same time, the proposed buffer does not preclude the possibility that such operators could retreat to a point beyond 50 yards and offer patrons a remote experience from aboard a vessel – perhaps a vessel with an elevated viewing platform. As described in this report, vessel-based dolphin viewing is common in the islands, and when combined with other sightseeing or recreational activities, success is not unusual.

At the same time, the proposed regulatory change has the potential to generate certain deleterious impacts that are not limited to one industry sector or another, including but not limited to: increased overall competition between businesses, increased crowding of vessels in certain dolphin-frequented areas – albeit beyond 50 yards, and associated effects on the dolphin-viewing experience among patrons. There may also be as-yet uncertain implications for the cetaceans themselves. But again, adaptive reactions to regulatory change remain speculative at this point in time, and it should be kept in mind that this project was not intended to assess prospective regulatory impacts or outcomes. Rather, the project and following report provide basic operational and economic information that can be used by NOAA analysts who are responsible for considering the nature and implications of the agency's pending regulatory actions.

Importantly, such baseline information is also essential for valid and reliable assessment of how the proposed regulations play out in reality, and for identifying lessons that can effectively inform future policies and rule-making processes regarding the interface between cetaceans and human beings.

ECONOMIC DATA REPORT

In Support of Analysis for

NOAA Fisheries Proposed Rule and Environmental Impact Statement:
Enhancing Protections for Hawaiian Spinner Dolphins to Prevent Disturbance

Introduction

Overview. The following pages summarize information collected on behalf of the Protected Resources Division of NOAA Fisheries Pacific Islands Regional Office (PIRO) in support of its efforts to examine potential social and economic effects of regulating human interactions with wild spinner dolphins (nai'a or *Stenella longirostris*) in the Main Hawaiian Islands (MHI). The work will contribute to the agency's Environmental Impact Statement (EIS) and rulemaking processes, which involves objective examination of a protected marine resource and its interactions with adjacent human populations,[3] including the owners, operators, and employees of tour operations that facilitate spinner dolphin viewing experiences along parts of the leeward coastlines of Hawai'i Island, Maui, and O'ahu, and the Nā Pali coastline of Kaua'i.[4]

This report updates and revises a similar report developed for PIRO in 2007 (cf. Impact Assessment, Inc. 2007). The current work provides the agency with new information that can be used to consider the nature and extent of socioeconomic impacts potentially resulting from any new measures intended to protect spinner dolphin populations. The project was not commissioned or designed to undertake detailed analysis of such impacts.

Impact Assessment, Inc. (IAI) conducted the present study in collaboration with NOAA contractor ERM West. ERM has long been involved in spinner dolphin research in the Hawaiian Islands. IAI is a U.S.-based small-business that specializes in delivery of scientific products needed to enable balanced environmental policy decisions and well-informed planning processes

- including those associated with conservation of protected species in the MHI. Finally, the project benefited from the involvement the Schmidt Ocean Institute, key personnel of which have been involved in research of spinner dolphin tour operations since 2009.[5]

Regulatory Environment. Hawaiian spinner dolphins feed in the deep sea at night and return to sheltered bays and other nearshore zones during the day. Given that spinner dolphins can easily be approached and viewed as they rest in sheltered bays and as they transit various nearshore areas around the islands, commercial dolphin-viewing tours have become increasingly popular in

[3] The rationale for, and nature of the EIS, titled *Enhancing Protections for the Hawaiian Spinner Dolphin to Prevent Disturbance,* are described in detail in the Federal Register, Vol. 81, Issue 164, August 2016, available online here.

[4] The MHI also include Lāna'i, Kaho'olawe, and Moloka'i. Guided dolphin-specific tours are not known to occur in these areas. The mountainous leeward or westerly sides of Hawai'i Island, Maui, and O'ahu disrupt the region's predominant easterly tradewinds and thereby provide ideal surface conditions for boating, diving, and viewing of dolphins. Morning conditions along the northwest-facing Nā Pali coast are also often calm and conducive to dolphin viewing. All leeward shores are subject to periodic large swell events, which can preclude tour activities.

[5] Reviewers are referred to the work of Wiener (2016) who provides in-depth discussion of human-dolphin interaction issues in Hawaii, and socioeconomic analysis of dolphin tours operating around the islands.

recent decades. But close-proximity interaction between humans and spinner dolphins are known to negatively affect the health and fitness of the cetaceans – by constraining or altering essential behaviors, including but not limited to feeding, nursing, mating, breathing, migration, resting, and sheltering (cf. U.S. Department of Commerce 2016: I; Lammers 2004).

Given that a core NOAA mission involves protection of marine species such as *Stenella longirostris,* the agency has developed prospective regulatory strategies to minimize such disruptions.[6] Because the conservation strategies in question include regulations that could affect the human environment, viz., dolphin tour owners and operators, an EIS is being prepared to formally assess the situation. As described in the draft version of the EIS prepared in 2016:

> The National Marine Fisheries Service is proposing to adopt regulations to enhance protections for Hawaiian spinner dolphins from various forms of take from human activities that cause harassment or disturbance [including reduction of] the impact of viewing and interaction on these animals. This action is being undertaken pursuant to the Marine Mammal Protection Act (MMPA), 16 U.S.C. 1361 et seq., and its implementing regulations. Alternatives to the proposed action and potential environmental impacts are discussed [herein]. The alternatives, or the actions considered as part of the alternatives, are not expected to have measurable negative impacts on spinner dolphin populations but may have socioeconomic impacts on commercial tour operators operating in certain geographic locations. The actions considered are not expected to result in irreversible or irretrievable commitments of resources (U.S. Department of Commerce 2016: I).

The preferred alternative put forward in the proposed regulation seeks to provide protection for Hawaiian spinner dolphins from disturbance by establishing a 50 yard approach buffer. This is also described in the FEIS:

> To reduce take resulting from human activities, NMFS is proposing to adopt regulations implementing the preferred alternative [that] do the following: prevent people and vessels (including motorized, nonmotorized, and self-propelled vessels) from swimming with and approaching within 50 yards (approximately 46 meters) of Hawaiian spinner dolphins within two nautical miles (3.7 km) of each of the main Hawaiian Islands and in designated waters bounded by the islands of Lanai, Maui, and Kahoolawe. The analysis of alternatives and consequences will inform NMFS decisions on actions taken under the Marine Mammal Protection Act to reduce the take of Hawaiian spinner dolphins and to prevent long-term adverse impacts to resident spinner dolphin populations in Hawaii as a result of viewing and interaction (U.S. Department of Commerce 2016: I).

[6] Spinner dolphins are protected under the Marine Mammal Protection Act of 1972 (MMPA), which prohibits the take of marine mammals in our nation's waters and by U.S. citizens in international waters. The Act also precludes legal importation of marine mammals and related products. "Take" refers to any attempt to hunt, capture, collect, kill, or harass any marine mammal. While viewing and other forms of tour-related interactions between humans and spinner dolphins were not formally regulated in the Hawaiian Islands (apart from the MMPA), close proximity interactions with humans is being considered by federal agencies as a form of harassment. NOAA presently implements a non-obligatory "Dolphin SMART" education and outreach program that is designed minimize any deleterious impacts associated with tour-based interactions. The acronym **S**MART stands for: **S**tay back 50 yards from dolphins; **M**ove cautiously away if dolphins show signs of disturbance; **A**lways put your engine in neutral when dolphins are near; **R**efrain from feeding, touching, or swimming with wild dolphins, and **T**each others to be Dolphin SMART. Participation in the program is common among dolphin tour guides active in the Hawaiian Islands. But it is not universal.

> Under alternative 3(A), NMFS would prohibit swimming with and approaching a Hawaiian spinner dolphin within 50 yards by any means. The prohibitions apply to all forms of swimming with, and approaching, in water and by air. Forms of approaching spinner dolphins include, but are not limited to, swimming, operating a manned or unmanned motorized, non-motorized, self-propelled, human powered, or submersible vessel; operating an unmanned aircraft system or drone; and approaching at the water's surface or underwater (i.e. scuba or free diving). This also includes approach by interception; in other words, placing a vessel or person in the path of an oncoming spinner dolphin so that the dolphin surfaces within 50 yards of the person or vessel, also known as leapfrogging . . . This alternative prevents the range of human activities that occur in close proximity to Hawaiian spinner dolphins, including swimming with, touching or attempting to touch, corralling or herding into small areas, and enticing or attempting to entice spinner dolphins to approach humans within 50 yards by offering an object of interest to the dolphin . . . all of which have the potential to disturb spinner dolphins (U.S. Department of Commerce 2016: V).

Project Goal

The sole and specific goal of this project was to provide NOAA Fisheries Pacific Islands Regional Office with select technical information it requested to assist in: finalizing pertinent sections of its FEIS and Regulatory Impact Review (RIR); and attaining compliance with the federal Regulatory Flexibility Act (RFA), including the Initial Regulatory Flexibility Analysis and Final Regulatory Flexibility Analysis.

This project was *not* intended to: (1) generate a stand-alone report that describes or analyzes all of the regulatory alternatives originally considered by NOAA – since these are thoroughly described in the FEIS (available here); (2) provide a thorough economic impact review for the EIS; develop encompassing estimates of economic loss or gain potentially resulting from any new regulations on spinner dolphin tours; valuate the economic worth of spinner dolphins in the MHI, or analyze the value of the spinner dolphin tour sector vis-à-vis that of the larger Hawaii tourism industry[7] – since all such work would have necessitated accurate assessment of the indirect and induced economic contributions made by the industry and its support sectors to the island economy, with the necessary outlay of time and resources far exceeding those available for the current study;[8] or (3) utilize formal survey research methods to examine economic aspects of MHI spinner dolphin tour operations – since systematic development of a valid and meaningful survey instrument would have induced federal administrative procedures requiring expenditure of time exceeding the prescribed period of performance.

[7] Reviewers interested in Hawaii's vital tourism industry are referred to ongoing analysis generated by the Hawaii Tourism Authority (available here), and by the Hawaii Department of Business, Economic Development, and Tourism (available here). A particularly useful analysis of Hawai'i tourism vis-à-vis regional, national, and global macroeconomic trends is available in Laney (2009).

[8] Owners and operators of area accommodations are among the various beneficiaries of visiting dolphin enthusiasts, and also provide an important support function to the dolphin viewing industry. While the total number of tourists who seek out dolphin encounters is not readily quantified, a search on the popular Vacation Rental by Owner (VRBO) site suggests that dolphin viewing is a commonly used marketing tool for attracting customers. For example, of the 205 VRBO rental listings located between Keauhou and Keokea on Hawai'i Island, eight percent use the word "dolphin" in the listing title, and 23% mention the snorkeling or swimming with dolphins in the accommodation description and/or guest reviews. Restaurants, farmer's markets, retail outlets, and other businesses that cater to tourists also benefit from dolphin-related tourism.

Research Objectives and Approach

This section summarizes project objectives and the technical approach used to address each objective during the course of the study. All project tasks, from preliminary archival research to production of the draft report, were contractually limited to and conditioned by what could feasibly be accomplished during a period of performance of four months, with initial work beginning at the end of May 2017.

Objective One: Review archival information descriptive of contemporary biophysical and human dimensions of human-spinner dolphin interactions in the MHI, including economic expenditures associated with patronage of dolphin tour operations.

This straightforward objective was pursued through background research at agency and university repositories on O'ahu, and through internet-based research. Apart from: work conducted by Wiener (2016); the previous Economic Data Report (Impact Assessment, Inc. 2007); and information already compiled by NOAA, useful economic description of the spinner dolphin tour industry as it operates in the MHI is very limited. U.S. Census data were compiled to provide PIRO staff members with general demographic indicators for the principal population centers on Kaua'i and Maui, and for communities located near areas where underwater dolphin tours are conducted along the Kona side of Hawai'i Island and Leeward O'ahu. Data regarding MHI commercial boat tours were acquired from the State of Hawaii Division of Boating and Ocean Recreation to indicate the overall size of the industry as it operates in the study areas.

Table 1-1 All Permitted Commercial Tour Vessels Operating in the Study Areas: 2016-2017

County	Number of Permitted Commercial Tour Vessels
Hawai'i (Kona side)	266
Maui (West Maui)	123
O'ahu (Leeward)	28
Kaua'i (Nā Pali)	49
Total	**466**

Source: Figures derive from the commercial use permit program administered by the State of Hawaii Divisions of Harbors, and Ocean and Boating Recreation. The data capture vessel-based operations that provide all manner of tour services, including sport fishing, diving, dining, sailing, para-sailing, cruising, ecotourism, and many board sports, among others.

Objective Two: Use archival research, discussions with NOAA staff and other knowledgeable persons, and social network sampling methods to identify all dolphin-specific tour businesses currently active in the MHI;

The Need for Primary Source Research. An important element of this project involved enumeration and categorization of businesses that intentionally facilitate spinner dolphin encounters of all kinds around the MHI. Archival research was minimally fruitful in this regard. Preliminary queries regarding acquisition of relevant data from the State of Hawaii, Department of Labor and Industrial Relations, Statistics Division made clear that: (a) relevant data are not likely to be readily available at a level of resolution that would shed light on the economic nature of charter boat industry sub-sectors, such as spinner dolphin or manta ray tour operations, for instance; (b) relevant license information invariably is proprietary in nature and therefore difficult to access, requiring data sharing agreements and/or close interaction with agency statisticians to enable useful summary data or analysis; and (c) while execution of data sharing arrangements and production of useful data are within the realm of possibility, these processes

take many months and in some cases up to one-year to complete in Hawaii. Similarly, archived business data do not provide a rapid or easy solution to characterization of the dolphin-oriented spiritual retreat operations described in this report. Finally, archival data reviewed for potential use in this project were not fully up-to-date. Given all of these factors, primary source research, including direct observation, presented the only legitimate possibility for developing valid, timely, and up-to-date enumeration, description, and categorization of tours that facilitate spinner dolphin encounters in the islands.

Sampling Rationale and Strategy. This project was not a general exploration of interactions between spinner dolphins and all commercial tours in Hawai'i.[9] Given available time and resources, the project was necessarily focused on providing PIRO with information it requested for use in the EIS and rule-making processes, i.e., basic economic information regarding tours that facilitate close interactions with dolphins. Such operations are at the heart of the conservation issue being addressed in the EIS. Carrying this reasoning further, special effort was applied to the collection of proprietary economic information from a growing number of businesses that facilitate *underwater* tours[10] from staging points along the leeward side of O'ahu and Hawai'i Island. The rationale here was that: (a) if enacted, the proposed spatial buffer could preclude or alter underwater tours since the zone of no interaction would exceed the distance at which visibility is sufficient for viewing the animals;[11] (b) according to PIRO staff, up-to-date economic and operational information about such tours would therefore be particularly useful in the EIS and rule-making processes; and (c) the level of work and associated time needed to forge trusting relationships and transfer of sensitive economic information required that in-depth interview work be focused especially on operations most likely to be affected by a spatial buffer, i.e., those offering underwater interactions.

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[9] In reality, any given commercial tour vessel may encounter spinner dolphins on any given day in the Hawaiian Islands, with some operators slowing, stopping, or changing course to afford patrons a viewing experience. Charter fishing captains typically do not slow or stop for spinner dolphins while in transit in the open ocean since this would detract from the missions of finding and catching fish. Given keen swimming and navigational skills, spinner dolphins do sometimes ride the bow and stern wakes of tour vessels and sportfishing boats, and thus a viewing experience may occur without the captain's intent, without any change in speed or course, and without any identifiable harm to the animals. Such general and unintentional interactions were not the focus of this project. But they can be difficult to clearly differentiate from similar interactions that occur when the captain intentionally sets the vessel's original course to intersect with dolphins in order to please clientele.

[10] The essence of such tours involves viewing dolphin from within the water column using a dive mask. The 2007 Economic Data Report (Impact Assessment, Inc. 2007) used the phrase "direct interaction" to represent facilitated encounters that involved swimming with, touching, and/or close-proximity viewing of spinner dolphins from within the water column. Facilitation of close interactions continues to occur, though many operators assert that the interface is now less obtrusive than in years past. We now use the phrases "underwater encounter" rather than "direct interaction" in reference to tours occurring in the water and "vessel-based," rather than "indirect," when referring to viewing of cetaceans from above the water column. Regional tour brokers and advertisers variably use phrases such as "swim-with dolphin tours," "dolphin snorkels," "dolphin experiences," and "dolphin encounters."

[11] The success of businesses offering underwater tours relates in part to the facts that dolphins predictably congregate in certain sheltered resting areas along the leeward coastlines, and that underwater visibility and surface conditions in such areas are typically conducive to viewing dolphins. According to the NOAA Diving Manual (Warlaumont 1991:10-6) visibility ranges from 50-100 feet in the MHI, though occasionally less or more, depending on light, turbidity, swell action, and other factors. However, the proposed 150-foot buffer exceeds the upper end of this range, with implications for underwater viewing as a commercial enterprise.

A social network or referral process[12] was used to identify the specific universe of business owners and operators who facilitate underwater encounters with spinner dolphins on a regular basis. This process consumed extensive time and project resources but generated a valid estimate of relevant tour operations (Table 1-2 below). Given differences between experiences offered by commercial tour boat owners/operators and owners/operators of spiritual retreats, we differentiate these types of businesses in the subsequent tables. The nature of such differences is described in subsequent sections of this report.

Table 1-2 Tours Known to Facilitate Underwater Dolphin Encounters, by Island: 2016-2017

Type of Tour	Island		
	Hawai'i	O'ahu	Total
Commercial Boat Tours	47 †	7*	54
Spiritual Retreat Tours	47 ††	0	47
Total Tours by Island	94	7	101
Total Tours	**101**		

Source: Primary source research, 2017; †47 tours operated by 41 Hawaii-based business entities; ††6 tours operated by 6 Hawaii business entities and 41 tours by 41 off-island entities; *7 tours, 7 Hawaii-based business entities.

Objective Three: *Contact, establish rapport, and arrange for in-depth interviews with owners, operators, and/or managers of currently active dolphin tour businesses throughout the MHI*

Using the sampling frame and rationale described above as points of departure, the research team undertook extensive work to: (a) identify the location of tour offices, staging areas, and key individuals working in the industry;[13] (b) travel to tour offices, staging areas, and other locations to meet with key individuals active in the industry; (c) describe the nature and intent of the work to such individuals and acquire informed consent to participate; (d) establish rapport with such persons; (e) undertake initial interviews; and (f) work with interviewees to identify other owners and/or operators active in the industry sectors of interest.

Response Patterns. Most business owners or operators who were asked to participate in this study were willing to contribute and did so without reservation. Only 10 of the Hawai'i Island-based business owners who were contacted declined to participate or could not provide useful information. A total of 7 prospective informants could not be reached after multiple attempts – most such persons were said to be on travel leave. All Hawai'i Island-based dolphin-oriented spiritual retreat operators who were contacted for involvement in the study did so without reservation. All O'ahu-based owners/operators providing underwater encounters participated in the study, though one provided only qualitative information. Roughly 40 percent of respondents replied in full to requests for detailed economic information about their businesses and thus the data tables provided later in this report include the number of responses (expressed as n) for any given category of information. Table 1-3 below depicts the final sample of owners or operators

[12] In this case, the process began when field researchers asked key agency officials to identify particularly knowledgeable owners or operators of spinner dolphin tour operations and where they could be found. Persons so identified were subsequently interviewed and asked to identify other tour owners or operators in their category or class of business. This process continued until no new persons were identified. Hanneman and Riddle (2005) provide a useful discussion of this approach and its applications for delineating samples of key informants.

[13] This was accomplished in large part by meeting Objective Two above.

of businesses known to be facilitating encounters with spinner dolphins in the MHI during 2017.[14] Table 1-4 provides the same data but differentiates the interviewees by operation.

Table 1-3 Final Sample of Business Owners and Operators, by Island

Type of Business Represented	Island				
	Hawai'i	O'ahu	Maui	Kaua'i	Total
Commercial Boat Tours	33	9	16	15	73
Resident-Owned Retreats	14	0	0	0	14
Total by Island	47	9	16	15	87
TOTAL	**87**				

Table 1-4 Final Sample of Business Owners and Operators, by Island and Type of Operation

Type of Operation	Island				
	Hawai'i	O'ahu	Maui	Kaua'i	Total
Dolphin-Oriented Retreats Operated by Hawaii-based Spiritualists	6	0	0	0	6
Dolphin-Oriented Retreats Run by Spiritualists not from Hawaii	8	0	0	0	8
Tours Facilitating Underwater Dolphin Encounters (swim-with tours)	28	7	0	0	35
Vessel-Based Tours that May Encounter Dolphins in Routine Operations	5	2	16	15	38
Total by Island	47	9	16	15	87
TOTAL	**87**				

Table 1-5 below depicts the total number of persons who participated in the study. These include the business owners depicted in Tables 1-3 and 1-4 above, and the many persons who helped inform the overall research process and description of spinner dolphin-related operations and issues provided in each chapter of this report. These include highly informative hotel booking agents, various public officials, and persons working in business sectors that support the tour boat and retreat industries. The table depicts the number and type of *interviewees* consulted rather than number of *interviews* conducted. In many cases, key informants were interviewed multiple times to refine understanding of certain topics and/or to verify information.

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[14] Most respondents were forthcoming and knowledgeable and therefore were consulted more than once. Others could provide only marginally useful information and were not re-contacted.

Table 1-5 Total Interviewees, All Islands

Business or other Entity Represented by Interviewee	Interviewees
Underwater Tours (Swim-With)	32
Vessel-Based Tours (No Swim)	32
Spiritual Retreat	18
Addiction Clinic Offering Dolphin Therapy	1
Kayak Rental and Tour Businesses	4
Ocean Tour Booking Agents	5
Dolphin Tour Vessel Captain	5
Dolphin Tour Vessel Crew/Swim Guides	3
Dolphin Tour Photographer	2
Dolphin Tour Patrons from Japan (Couples/Families)	3
Japanese to English Translators	2
Hawaii Dept. of Boating & Ocean Rec.	5
City/County Lifeguards Working at Tour Access Points	3
State Park Employees Working at Tour Access Points	2
Providers of Accommodations for Dolphin Tour Patrons	4
Hotels Providing Dolphin Tours	1
Other Key Informants	4
Total	**126**

Objective Four: *Undertake ethnographic observation of spinner dolphin tour operations in the MHI to enable documentation of: (a) human-dolphin interactions provided by each kind of tour; (b) valuation of the experience by patrons; (c) operator interactions with patrons and guidance/information provided to the patron; and (d) patron adherence to or deviation from guidance provided by the operator;*

Participant observation and documentation of tour activities were undertaken by professional social scientists deployed to Hawai'i Island, O'ahu, Maui, and Kaua'i. On Hawai'i Island, observational work was conducted from Honokohau Harbor; at Kealakekua, Kailua, and Keauhou Bays; and at certain dolphin resting areas along the coastlines of South Kona and the Puna District. On O'ahu, field researchers worked at Waianae, Ko'olina, and adjacent coastlines, including those of Keawaula ahupua'a. On Maui, field staff undertook observation-based documentation of at Lahaina and Ma'alaea. Finally, observation-based work was undertaken at Hanalei Bay, Port Allen, and Kiki'aola on the island of Kaua'i. These areas are specified on the maps provided in this document and each constitutes or is contained within Census areas for which basic demographic information is tabulated in each chapter.

Research staff also anonymously participated in, carefully observed, and documented six spinner dolphin tours around the islands. This part of the study involved a degree of cultural and physical immersion. Two trips involving underwater encounters were documented along the shores of O'ahu, and four in nearshore locations along Hawai'i Island. One generalized vessel-based sightseeing tour advertising potential dolphin encounters was documented along the coastline of West Maui, and one such trip was documented along the north shore of Kaua'i.

Finally, research staff participated in one underwater spinner dolphin tour that was accessed from the shoreline at a bay along the South Kona District of Hawai'i Island. All such trips were systematically documented and contribute to the descriptive elements of this report.

Objective Five: *For each main island where dolphin tour-oriented operations occur, and for each type of business, conduct in-depth interviews and follow-up discussions needed to gather, verify, and refine select economic and operational information requested by PIRO*:
Open-ended questions and semi-structured protocols rather than highly structured survey instruments were used guide the in-depth interview process. Our many years of experience conducting socioeconomic research in a variety of rural community settings around the MHI clearly indicate that relatively informal interviewing methods should be implemented during early phases of interaction with key informants (cf. Glazier et al. 2007). This is in keeping with local cultural norms and can augment the transfer of sensitive information.[15] But it is important to note that with skill and training, a social scientist can systematically elicit the same kinds and quality of numerical and qualitative information using either a relatively informal approach, or formal approaches such as use of formal survey instruments. The subtle mechanics and benefits of skilled interviewing cannot be overstated here.[16]

The protocols developed for use in the current project provide cues for consistently guiding the interviewers and interviewees through basic lines of inquiry about the dolphin tours in question. These lines of inquiry directly reflect the information requested by the project sponsor, with additional queries added to explore salient topics and themes as they emerged during the interview (Appendix A).

Objective Six: *Identify, through interview work with spiritual tour operators, a sub-sample of patrons (including Japanese patrons) who travel to Hawai'i to engage solely in dolphin tours, and interview such patrons to ascertain a valid understanding of the typical type and range of expenditures involved in their trip to Hawai'i*;
Based on PIRO's information needs as indicated in the SOW, this objective was intended to enable cursory description the general types and ranges of expenditures involved in overseas trips to Hawaii that are made for the sole purpose of viewing spinner dolphins. Such trips reportedly are relatively rare given the many activities typically undertaken by tourists in Hawaii. But they are known to occur and appear to have become more common among persons who engage in dolphin-specific spiritual retreats. A small sample of visiting spiritual retreat patrons from Japan, Europe, and the North American continent were interviewed to examine this topic.[17] Available time and resources did not allow for extensive research interactions with patrons.

[15] A valid and culturally meaningful survey instrument could now be constructed based on the results of the current study, and most effectively implemented with the many owners/operators whose trust has been won through participation in the current study.

[16] Instructive discussions are available in Bernard (1998) and Singleton and Straits (1999). Highly trained and thoroughly experienced social scientists participated in this study. Our approach is objective and systematic.

[17] It was found that, apart from variable airfares, all basic expenditures such as meals, lodging, and transportation were incorporated in the total cost of the retreat. Retreat costs thus provide a reasonable proxy for total expenditures among persons who travel to Hawaii solely to view dolphins.

Objective Seven: *Code and enter pertinent information gathered through the in-depth interview and ethnographic research process into a relational database to enable qualitative and quantitative data analysis.*

Excel, SPSS, and Word software were used to store, manage, and generate basic descriptive statistics for use in this report. ArcView was used to generate the project maps that indicate the locations where dolphin tours occur. Quantifiable elements of the in-depth interviews and some qualitative variables were coded to allow for consistent univariate analysis. Qualitative information is reported and quantified in straightforward terms.

Objective Eight: *Prepare a detailed and readily comprehensible report and summary that characterize key socioeconomic and operational dimensions of businesses that provide tourists and residents with spinner dolphin interaction experiences around the MHI.*

As stipulated in the project Statement of Work (SOW), and in addition to the previous sections, this report includes discussion of: (a) dolphin tour operations and related human-dolphin interactions currently occurring in the islands; (b) spinner dolphin tour economics by type and island of operation, including tabular display of quantitative analysis; (c) the geographic distribution of dolphin tour operations around the MHI; (d) likely operational responses to, and operation-specific economic effects of, the proposed spatial buffer; and (e) summary of operational and economic effects potentially resulting from the proposed spatial buffer.

Focus of the Project

Fieldwork and related archival research for the current project were undertaken between early June and mid-August 2017. The fieldwork was highly intensive and undertaken as efficiently as possible. Extensive data were collected from a variety of sectors, but with recognition that analysis of potential regulatory effects would benefit especially from focused attention on operations that facilitate underwater encounters. As such, the research team worked to establish good working relationships with operators who focus primarily on providing spinner dolphin encounters, and especially those who provide such encounters from within the water column.

Persistence, sensitivity, and the stated need for information that would improve the policy process ultimately encouraged numerous owners and operators offering underwater tours to provide select economic information about their businesses.

Essential Background

Overview. Three principal for-profit operations were purposely or opportunistically facilitating spinner dolphin encounters in the MHI during the summer of 2017: (1) commercial boat tours providing close-proximity underwater viewing of dolphins; (2) tours that facilitate spiritually oriented underwater interactions with dolphins – using a boat for transport and staging, but for certain operations staging from the shoreline; and (3) boat-based tours that opportunistically provide dolphin viewing experiences from above the water column as one of an array of other activities such as reef snorkeling, paddle-boarding, dining, and so forth. Some such operations advertise dolphin interactions. Operation type (1) occurs along: (a) the Kona side of Hawai'i Island; and (b) Leeward O'ahu. Operation type (2) occurs exclusively along the Kona side of Hawai'i Island. Operation Type (3) occurs throughout the study islands, though this report describes such tours and tour operations only as they are conducted from Maui and Kaua'i.

Tour Boat-Based Underwater Dolphin Viewing. Given the scenic nature of the Hawaiian Islands, its various forms of marine life, and numerous ocean-based recreational opportunities, numerous local commercial boat tour operators are active in the islands. But a relatively small number of commercial operations advertise and intentionally facilitate close encounters with spinner dolphins (Table 1-2). Marketing strategies and operations vary, with facilitated experiences ranging from mask-equipped patrons passively floating and observing dolphins that are swimming underwater and along the surface, to patrons actively swimming and diving close to the dolphins.

Patrons Wait for Dolphins to Appear along the Leeward Coast of O'ahu

The operations proceed in a straightforward manner. Patrons meet the operator at a proximal harbor, whereupon they are transported by boat to an embayment where dolphins are known to rest during the day (cf. Norris 1991 and Wiener 2016) or where they are known to transit between preferred areas. Captains or their crew typically interact with the patrons during the trip, describing dolphin behaviors, population dynamics, prey and habitats, and other attributes.

Patrons are provided with fins, snorkels, and masks, though some come aboard with their own equipment. Instructions are commonly provided to help minimize overtly obtrusive interactions, such as direct physical contact. Once in the ocean, patrons witness various dolphin behaviors, though in resting bays these most typically involve slow rhythmic swimming. In some cases, dolphins are not readily available for viewing and some waiting and/or interim activities are undertaken, including snorkeling above coral reef ecosystems in conditions that are often ideal for viewing marine life of many varieties.

Captains approach dolphins in two basic ways. When dolphins are in transit along the coastline, the strategy is to move outside and ahead of the pod and position guests in the water to view the

creatures as they pass. As the dolphins move onward, guests climb back on-board and the captain will again move outside and ahead of the pod to re-position the patrons. Operators who pursue this strategy usually make two to four such passes.

When dolphins are in the resting bays, and for captains who pursue them in such areas, the strategy is to position the vessel on the outside of a circling pod and drop the patrons in the water. The patrons will then wait for the dolphins to circle under or around them. In large bays or where many boats are present, such as in Kealakekua Bay, guests may have to swim some distance to position themselves in areas where the dolphins are circling.

Many captains and certain dolphin tour business owners are additionally involved in other ocean-based businesses, including fishing charters, generalized sightseeing, recreation-oriented tours, and other eco-tourism operations. As noted above, underwater dolphin viewing may be complemented with other sightseeing or recreational activities on any given trip, particularly if conditions are not ideal or dolphins are absent.

Certain captains own and operate tour businesses, while others work for business owners on a salaried or contractual basis. Based on our fieldwork, the proportion of each arrangement appears roughly equal. Three of the Big Island-based businesses contacted during this study are owned by hotel corporations, as is one of the O'ahu-based businesses.

Dolphin-Oriented Spiritual Retreats. The number of Hawai'i Island-based spiritual retreats has increased extensively over the last decade, from six in 2007 to approximately 47 in 2017. Almost all the new businesses are owned and operated by non-residents who arrange for charter vessels/captains, organize, and conduct tours while on-island during certain parts of the year.

Although such persons were relatively difficult to contact during this short-duration study, a sufficient sample was contacted to enable basic description (see Table 1-4).

Dolphin interactions are said to contribute directly to the various objectives of the spiritual retreats. These objectives include: spiritual growth; life coaching and lifestyle transformation; interspecies communication; female identity and power; and physical and emotional healing. Almost all retreats facilitate dolphin encounters from within the water column, with entry into the water occurring either from contracted vessels or from the shoreline. Patrons free-dive among or around the dolphins or float on the surface with their masks submerged to view the creatures. Retreat patrons observed during this study were elated by the experience, and those contacted report that the experience is highly valued in subjective-experiential terms and worth the dollar price of admission.

One local retreat operator formerly owned and operated her own vessel, but no longer does so. As many as seven local captains work for retreat owners to provide dolphin encounters in bays along the Kona coastline. One of the more active businesses is an addiction counseling center.

Spiritual retreat operators enable various forms of interaction with spinner dolphins, including: being seen and approached by dolphins; engaging in play with dolphins; and hearing dolphins communicate with one another. Some offer that metaphysical contact with the creatures can occur. While actual physical contact reportedly occurred with some regularity in years past, numerous owners/operators this now occurs relatively infrequently. In the absence of ongoing observation, the frequency of direct contact obviously cannot be quantified with any confidence.

Spiritual retreat operations also typically facilitate meditation or other spiritually oriented activities from aboard the vessel or in the water. Apart from organized retreats, certain individuals residing on the Big island offer underwater dolphin encounters on an informal basis. These typically involve some sort of therapy and operate largely by word of mouth (and often "under the table"). Such operations are not addressed in this report.

General Commercial Tour Boat Operations and Dolphin Encounters. Numerous businesses in the MHI offer generalized ocean tour operations. Most facilitate a wide range of ocean-related activities, including: reef snorkeling, viewing various forms of sea life including spinner dolphins, cruising and dining, stand-up paddle boarding, and other forms of recreation, eco-tourism, and entertainment. Most tours also include an educational element, wherein the captain or crew discuss various biophysical and cultural aspects of the surrounding land and ocean.

Although large commercial tour operations around O'ahu and Hawai'i Island may use prospective dolphin encounters as part of their advertising strategies, their actual operations do not focus solely on providing such encounters. Notably, no commercial tour boat companies operating from Maui and Kaua'i report facilitation of underwater encounters with dolphins.

Chance or routine encounters do occur along portions of all the main islands, but the main focus remains generalized sightseeing and other activities.

When captains operating generalized boat tours do encounter dolphins, many attempt to give their patrons a good but unobtrusive view from beyond 50 yards – as prescribed by the NOAA Dolphin SMART program. This is not universal, nor is it always possible, given the often-unpredictable behavior of the cetaceans. Patrons view, photograph, and sometimes enthusiastically applaud the dolphins as they cruise past the boat, break the surface, or exhibit various aerial maneuvers.[18]

Tour operators offer various reasons for why dedicated viewing or underwater tour sectors have not developed around Maui and Kaua'i. Perhaps foremost is a relative lack of ideal ocean conditions and resting areas. But operators also assert a long-standing ethic against the practice of swimming with dolphins, and ongoing "education" of new tour operators in this ethic.

Miscellaneous Encounters. The 2007 study involved cursory assessment of kayak tour businesses then operating around the MHI. Interviews and background research at that time made clear that the typical intention of such operations was to provide clients with a variety of recreational and sightseeing experiences that typically did not include dolphin interactions.

Additionally, most kayak business owners reported discouraging kayak renters from engaging spinner dolphins. The establishment of a commercial permit system for kayak operators at beach areas once popular for dolphin-directed kayaking (such as Kealakekua Bay on Hawai'i Island), and closure of certain beach areas (such as La Perouse Bay on Maui), have reduced the overall number of kayak rental companies and thereby limited kayaking in dolphin resting areas.

Determination of the extent of dolphin interactions among kayakers operating their own vessels was beyond the scope of this study. For each of these reasons and given the need for highly focused research as stated above, kayak operations were not included in the current analysis.

[18] Utley (2015) provides a useful review of literature regarding the nature and range of possible reasons for aerial behavior among Hawaiian spinner dolphins.

It should also be noted that certain individuals travel to the MHI to view dolphins on their own, as do some residents. Most such persons use popular shoreline access points to seek out dolphins in resting bays on O'ahu and Hawai'i Island. This phenomenon is not addressed in the current report.

Overarching Factors & Findings of Relevance to the EIS and Rulemaking Processes

Under stipulations in NEPA, Executive Order 12898,[19] and other legislation, various information is needed for assessment of the prospective human-environmental effects of federal regulatory actions. In this case, such information relates to measures that could potentially be established to regulate human interaction with spinner dolphins in the MHI. This includes information about the size of dolphin tour businesses and ownership and employment in the part of persons in minority and low-income populations. All such information was collected to assist PIRO in determining the potential for adverse impacts to such populations should regulations be enacted and potentially constrain the economic viability of their businesses or sources of employment.

Formal Classification of Size of Business for the RFA. All business owners and operators who offer underwater dolphin encounters in the MHI can be classified as small businesses under the conditions of 13CFR121.201, the federal rule that defines size eligibility for various types of business enterprises.[20] In this case, the principal criterion for small business status is less than

$7.5 million in annual receipts. Annual receipts for certain large tour vessel operations in the MHI reportedly exceed this threshold. Such operations were not the focus of the current study.

Ownership and Employment for Persons in Minority and Low-Income Populations. Hawai'i is unparalleled in the U.S. in terms of the ethnic complexity of its resident populations, with roughly one in four residents claiming mixed ancestry (cf. Pew Research Center 2015). As such, identification of distinct minority groups and effectively identifying populations that may be disproportionately affected by a new regulatory regime can be problematic. However, as originally requested by PIRO staff, our interview process served to identify business owners who self-identify as being of Native Hawaiian or part-Native Hawaiian ancestry.[21] Two Native-Hawaiian owned commercial tour businesses offering underwater tours were identified on O'ahu (33%), and three were identified on Hawai'i Island (6.3%). None of the spiritual retreat business owners or operators reported Native Hawaiian ancestry. Fieldwork also served to identify Native Hawaiians employed in the commercial tour businesses of interest (Table 1-5 below). Notably,

[19] Executive Order 12898 (EO 12898) states that to the extent practicable "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

[20] We use Standard Industrial Classification (SIC) code 487219 (Scenic and Sightseeing Transportation, Water) to determine the size threshold of the businesses in question. The intent of applying 13CFR121.201 in this case is to enable PIRO to examine the potential for any disproportionate economic impacts among small business entities involved in the spinner dolphin tour industry.

[21] Other minority populations may be considered for purposes of EO 12898, but identification of, or information regarding such populations were not requested by NOAA, nor were definitional thresholds for low-income populations requested or defined prior to the study.

certain spiritual retreat leaders reported that they periodically hire Native Hawaiian residents to: lead pule (prayers); provide instruction for hula and lei-making; play music; and/or discuss Hawaiian culture and history.

Table 1-6 Native Hawaiians Employed in Tour Businesses Facilitating Underwater Dolphin Encounters: 2016-2017†

Employees	Island		
	Hawai'i** (sample size or n=22)	O'ahu (n=6)	Total (n=27)
Native-Hawaiian Employees	19	58	77
Total Employees††	166	135	301
% Native-Hawaiian Employees	8.7%	43%	26%

†Native Hawaiian or part Native-Hawaiian ancestry as reported by owners or operators. ††Includes part-time and seasonal employees.

Data Limitations and Organization of the Report

The reporting phase of this project was intended to be primarily descriptive in nature, though we do provide some cursory analysis in the final portion of this document as prescribed in the project Statement of Work (SOW). Description is focused on attributes of the businesses as these were reported by owners or operators in relation to the year preceding the study (June 2016-June 2017).

As noted above, specific forms of economic information were collected from businesses that, by virtue of their focus on close-proximity underwater viewing, are most susceptible to the potential effects of the proposed spatial buffer. This includes total gross revenues, which are reported for the spiritual retreats on Hawaii Island, and for commercial tour boat tours facilitating dolphin encounters along the Leeward Coast of O'ahu, the Nā Pali coastline of Kaua'i, and the Kona side of Hawai'i Island. Only two Maui operators were willing to provide revenue information. Given the small sample size and related confidentiality concerns, these data are not provided in this report. For the Kona-based commercial tour boat fleet, gross revenues are also reported as percentage ranges of the total gross that owners/operators attribute to the dolphin encounter portion of their business. As was the case in 2007, few business owners or operators in any locations were willing to divulge net revenue. Hence, this variable is not addressed in this report.[22]

Interviewees were advised that their identities and the information they provided would be held in strict confidence, and that all data gathered during the project would be aggregated in any subsequent description or analysis so as to safeguard the source of proprietary information. As noted above, we cannot and do not report on business activity in areas or sectors involving less than three businesses.

Each of the subsequent sections of this report are organized around the descriptive elements outlined in the project SOW. We provide additional data and description to advance understanding of interviewee perspectives regarding of the potential effects of the proposed spatial buffer on day-to-day operations, and the likely nature of their response to such regulation.

[22] In any event, it can be argued that gross revenue provides a more encompassing indicator of the overall contribution of the spinner dolphin tour industry to the local economy than does net revenue, and thus a more encompassing indicator of local impacts should the proposed spatial buffer be implemented.

Following this introductory section, we describe various social and economic dimensions commercial tour operations that facilitate spinner dolphin interactions in the MHI. The description is organized by island and is focused especially on: (a) general aspects of the human-geographic settings where tour-based human-spinner dolphin interactions occur, and (b) relevant operational and economic attributes of the types of businesses delineated above. Section Two provides information about the settings and dolphin-oriented tour businesses active along the Kona side of Hawai'i Island. Section Three is descriptive of relevant businesses and settings active along the Leeward Coast of O'ahu. Sections Four and Five describe relevant businesses and settings on Maui and Kaua'i, respectively. Finally, section Six summarizes key findings from the previous sections, and provides concluding discussion. References follow.

Sighting a Pod of Spinner Dolphins: Leeward O'ahu, Summer 2017

Economic & Operational Aspects of Underwater Dolphin Encounters: Hawai'i Island

This section describes relevant aspects of commercial boat tour and retreat businesses active on Hawai'i Island, also commonly referred to as the Big Island. We begin with brief discussion of the settings where underwater spinner dolphin encounters are known to occur, and areas from which tour operations depart. This is followed by basic description of local tour boat and retreat operations, and concise description of the results of fieldwork undertaken in this part of the MHI. Finally, we provide a summary of respondents' views on the proposed spatial regulation and the likely nature of their reactions to such changes.

Human-Geographic Context

Hawai'i Island is the southernmost of the Hawaiian Islands, and Ka Lae, or South Point, is the southernmost point in the U.S. Hawai'i is roughly 30 miles southeast of Maui, across the 'Alenuihāhā Channel. The Big Island is the largest of the MHI and the largest island in the United States. It encompasses 4,028 square miles of rugged volcanic terrain. Hawai'i County, which encompasses Hawai'i Island, was home to an estimated 191,482 persons in 2015.

The Kona coastline extends for some 70 miles along the west side of the island. Given its perennially dry climate, protection from tradewinds, clear nearshore waters, numerous resorts, and range of opportunities for ocean-oriented sightseeing and recreation, the region is of great interest to tourists. Nearly 1,326,000 persons travelled by air to the Kona Coast in 2016 (DBEDT 2016), with visitor spending reaching $2.1 billion (Hawaii Tourism Authority 2016). The Big Island is a popular location for corporate incentive trips, with 25,727 persons traveling to Kona for that reason in 2016 (DBEDT 2016).

Kailua-Kona (Kailua) is the largest town in the area, with a year 2015 population of 12,652 persons (U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates). Most visitors land at the Kailua Keāhole-Kona International Airport. Many find lodging in the coastal area from Waikola in the north to Captain Cook in the south. A variety of accommodations are available, from timeshare condominiums, hotels, bed and breakfasts, airbnbs, vacation rentals, retreat centers, and campgrounds. Table 2.1 below provides select population and economic data for communities that serve and depend on recreation-focused tourism along the coastlines of Central and South Kona.

Table 2-1 Select Demographic Data for Kona Coast Communities: 2015

Location	Population	Median Household Income	% Persons Below Poverty Line
State of Hawai'i	1,406,299	69,515	11.2
Hawai'i County	191,482	52,108	19.5
Kailua	12,652	56,596	15.4
Holualoa	8,390	69,444	11.7
Kahaluu-Keauhou	3,783	71,953	28.0
Kealakekua	1,894	59,609	15.3
Captain Cook	4,594	66,276	8.8
Honaunau-Napo'opo'o	2,813	56,250	9.7

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Honokōhau Harbor is located just north of Kailua-Kona. This is the largest harbor facility in the Kona region. A variety of charter fishing and ocean tour businesses are based here, as are many spinner dolphin-oriented tour operations. The latter depart for bays to the north and south where spinner dolphins are often present during daylight hours. Norris (1991) and Wiener (2016) provide extensive discussion of spinner dolphins, dolphin research, and a wide range of issues of relevance to human interaction with dolphins along this stretch of coastline.

According to the Hawaii Tourism Authority's Visitor Satisfaction and Activity Report for 2015, 18.4% of tourists from the mainland U.S. participated in a vessel-based eco-tour during their stay on the Big Island. Rates of participation in such tours range from 3.9% for tourists from Japan, 15.6% for tourists from Europe, and 19.9% for tourists from Canada. Ocean-oriented sight-seeing and recreational activities are enabled by businesses operating 266 vessels along the Kona side of Hawai'i Island. Dolphin viewing is one such activity. Other activities include: reef snorkeling, manta ray viewing, whale watching (in season), dining, and cruising., among others.

Relevant Ocean Tourism Activities and Locations on Hawai'i Island

Areas of Known Interaction and Primary Points of Departure of Commercial Boat Tours.

Commercial vessel and retreat operations involving dolphin encounters occur in numerous locations along the leeward Kona Coast (Map 2-1).[23] Underwater encounters between humans and spinner dolphins are known to occur primarily in, or during vessel transit to, the following locations:

1) Mahukona Beach Park, ~45 miles north of Kailua-Kona;
2) Puako Bay, ~30 miles north of Kailua-Kona;
3) Kiholo Bay, ~20 miles north of Kailua-Kona;
4) Makako Bay, 9 miles north of Kailua and adjacent to the airport at Keāhole[24];
5) Kailua Bay, a well-used area directly adjacent to Kailua-Kona;
6) Kealakekua Bay, ~5 miles south of the town of Captain Cook and ~15 miles south of Kailua;
7) Hōnaunau Bay, 11 miles south of Captain Cook and 21 miles south of Kailua;
8) Kauhako, ~12 miles south of Captain Cook and 22 miles south of Kailua

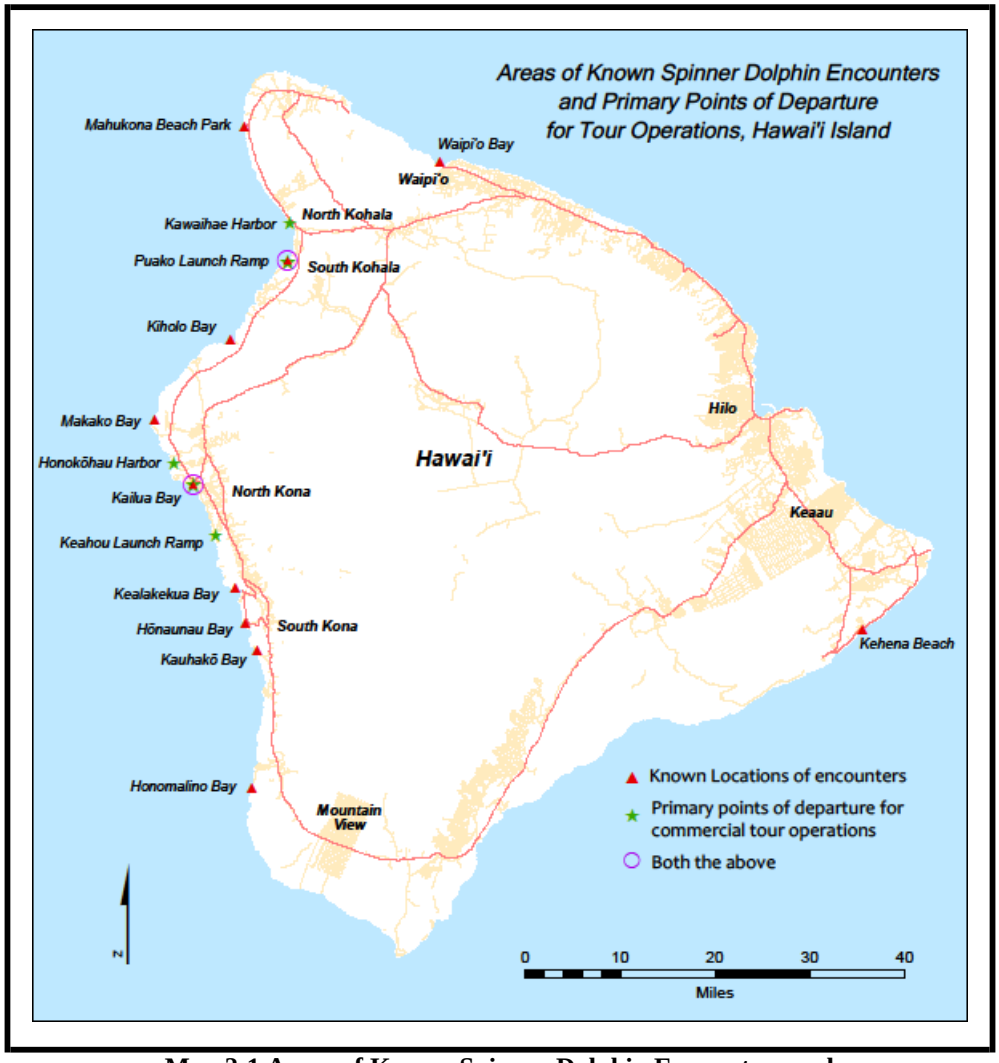
Commercial vessel operators offering underwater dolphin encounters operate from the following harbors and launch ramps:

1) Kawaihae Harbor, 35 miles north of Kailua-Kona;
2) Puako Ramp, about 30 miles north of Kailua-Kona;
3) Honokōhau Harbor and launch, about 4 miles north of Kailua-Kona; and
4) Keahou Launch Ramp, some seven miles south of Kailua-Kona.

[23] The term "leeward" refers primarily to the west-facing sides of the islands. These are sheltered from wind waves generated by prevailing east and northeasterly trade winds and thereby present smooth surface conditions that are favorable for resting dolphins and for humans who prefer ocean sightseeing activities in relatively tranquil waters.

[24] Respondents report that while spinner dolphins were often seen in Makako Bay in years past, this is no longer the case. One interviewee asserted that an aquaculture farm has attracted bottlenose dolphins to the area, and that this species has subsequently displaced spinner dolphins.

Popular shoreline access points are located at: Kailua Bay, Kealakekua Bay, Two-Steps at Hōnaunau Bay, and Ho'okena State Beach Park at the north end of Kauhako Bay. Other less frequently used access points include: Waipi'o Bay, adjacent to a remote valley located 22 miles north of Waimea on the northeast facing side of the island; Honomalino Bay, about 10 miles south of Miloli'i; and Kehena Black Sands Beach, 20 miles south of Pāhoa on the southeast coast.



Map 2-1 Areas of Known Spinner Dolphin Encounters and Primary Points of Departure for Tour Operations: Hawai'i Island

Kailua Bay is perhaps the most popular area for underwater dolphin encounters in the MHI. During morning hours when dolphins are often present, one can frequently observe as many as 12 vessel operators and their passengers in close proximity to spinner dolphins, many well within 50 yards of the animals – some in the water, some viewing from the vessels. Stand-up paddle boarders, kayakers, and swimmers are also typically in the immediate vicinity.

Spinner Dolphins as Seen from a Tour Vessel in Kailua Bay

Data of observation and interviews with knowledgeable informants make clear that Kealakekua Bay is particularly popular shore access point for underwater dolphin encounters in the MHI. Kealakekua means "pathway of the gods" in Hawaiian. This remains a place of cultural significance to the descendants of the original inhabitants of the islands. Many archaeological sites and various heiau (shrines) of stated contemporary importance to Hawaiians and other local residents are located here.

Kealakekua Bay is also a well-trafficked area. The 315-acre bay and its facilities are used extensively by local residents, including Native Hawaiian fishermen. The bay and surrounding lands are administered as the Kealakekua Bay State Historical Park. A memorial to explorer Captain James Cook is a popular tourist site. Extensive reef snorkeling opportunities can be found in Kealakekua, and it is popular among kayakers. Three kayak concessions are authorized to operate here. Motorized vessels are regulated in a variety of ways. For instance, all boats must maintain 'no wake' speeds and there can be no launching or landing from the wharf at Napo'opo'o landing or transporting of passengers around Ka'awaloa Flats.

Tour Boats, Snorkelers, and Kayakers Crowd Kealakekua Bay, Summer 2017

Traveling south, Hōnaunau Bay, also commonly referred to as Two-Steps, is the next popular access point for underwater dolphin encounters. Reefs areas are accessed by tour boats and from the shoreline. The bay is used extensively by Native Hawaiian fishermen. Land to the south is part of the Pu'uhonua o Hōnaunau National Historical Park.

Hōnaunau Bay: Mixed use Fishing and Snorkeling

A sandy beach at the predominately Native Hawaiian village of Ho'okena also affords relatively easy shoreline access to the ocean for underwater dolphin encounters. Traditional fishing activities associated with ōpelu (*Decapterus macarellus* or mackerel scad) and akule (*Selar crumenophthalmus or Bigeye scad*) have long been conducted adjacent to the village above nearshore ko'a (areas of mounded reef). These activities involve the use of: special foods to lure

and habituate the fish to a given ko'a; nets to harvest the fish; cultural arrangements for sharing the fish in family and community settings; and unique recipes for preparing the fish for consumption (cf. Glazier 2007).

Hawai'i County maintains a campground at Ho'okena, and a concession stand and kayak rental operated by Friends of Ho'okena Beach serve visiting tourists. Conflicting uses and value systems have been reported in previous years as increasing numbers of visitors seek to recreate or conduct commercial activities, including spinner dolphin tours, in ocean areas of great importance to local residents (cf. Glazier 2007). During the summer months of 2017, certain volunteers working at Ho'okena Beach Park reported that the area is often used by persons from other parts of the Big Island who swim with dolphins despite the presence of signs requesting otherwise.

Operational Tendencies of Commercial Boat Tours. Table 2.2 provides an overview of marine tourism and wildlife viewing opportunities and points of departure, as indicated by commercial permit data provided by the Division of Boating and Ocean Recreation.[25] The tally reflects the number of permitted vessels per category rather than number of businesses.

Table 2-2 Kona Coast Commercial Use Permits by Viewing Activity and Point of Departure: 2016*

Location	Dolphin-Related	General Snorkel	Whales	Manta Rays
Kawaihae (north)				
Moored at facility	0	3	2	0
Access by boat ramp	0	1	1	0
Kawaihae (south)				
Moored at facility	0	4	5	0
Access by boat ramp	0	0	0	0
Puako				
Access by boat ramp	3	4	4	1
Access from shoreline	0	0	0	0
Honokohau				
Moored at harbor	19	26	25	17
Access by boat ramp	15	27	26	18
Kailua				
Moored at pier	2	13	10	2
Access by boat ramp	2	2	2	2
Moored in bay	0	1	0	0
Keauhou				
Moored at facility	0	6	1	2
Access by boat ramp	13	16	11	10
Mauna Kea Beach	0	1	0	0
Mauna Lani	0	1	0	0
Total	**54**	**105**	**87**	**52**

Source: Basic permit data from Hawaii Division of Boating and Ocean Recreation – categories determined by field observations.

[25] Commercial use permits do not dictate what kinds of ocean recreation activity business owners can provide, and it is up to the permit holder how many activities are listed or denoted. As such, DOBOR data may not necessarily reflect the full or actual extent of participation in any given activity by any given business. Therefore, it is not possible to use these data to confidently identify which dolphin operations also facilitate other activities for their patrons.

Based on archival and field research conducted for the present study, approximately 41 commercial tour boat businesses offer underwater dolphin encounters along the Kona Coast. One business offers tours along the leeward coastlines of both O'ahu and Hawai'i Island.[26]

Three vessels are operated in association with water sports programs administered by large resorts or exclusive real estate associations (each a distinct business). Several fishing charter operators also occasionally offer underwater dolphin encounters as part of combination trips or private charters. Given the reportedly limited contribution of dolphin encounters to the overall business, and the difficulty of parsing the relative contribution of such encounters from other inputs, these two types of operations were not included in the study.

Seven vessels operating from Honokōhau are periodically leased by operators of retreat businesses, and three are hired by corporate incentive groups on a regular basis. All such tours involve underwater dolphin encounters.

The number of businesses offering underwater dolphin encounters along the Kona Coast has increased since data were last compiled for the 2007 economic data report (Impact Assessment, Inc. 2007). The increase is due in part to a court decision that increased the number of allowable commercial use permits for Honokōhau Harbor and Keauhou Bay.[27] Observing the interest of tourists in dolphins, many existing business owners also diversified to facilitate underwater dolphin encounters. This is particularly the case for businesses that historically specialized in providing general dive tours. Some spatial conflicts between tour boat operators have been reported, particularly in the increasingly crowded waters of Kailua Bay.

It should be noted that, in addition to dolphin viewing, almost all Kona Coast tour companies also provide opportunities for night-time manta ray viewing, afternoon reef snorkeling, winter whale watching, and/or scuba diving. Relative degree of dependence on underwater dolphin encounters and degree of diversification of activities vary across the fleet – patterns of which are particularly difficult to meaningfully characterize given ongoing and day-to-day operational flexibility and opportunism. Tour companies use a range of vessels, including rigid inflatables; single-hull motorized vessels ranging from ~23’ to ~45 feet length overall (LOA); motorized catamarans; and motorized-sail catamarans. The fleet is comprised of both moored and trailered vessels.

Ocean tours businesses active along the Kona Coast tend to offer morning trips that depart between 7:30 and 9:00 a.m., and return between noon and 12:30 p.m. Although two businesses advertise the availability of afternoon dolphin encounters, these are typically run only to meet overflow demand, and often involve extensive snorkeling rather than dolphin viewing.

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[26] Distinct gross revenue and employment figures are provided for business on each island.

[27] The number of commercial use permits available for ramp use at Honokōhau Harbor and Keauhou was previously informally limited by DOBOR managers to 35 and 11, respectively. A lawsuit filed in 2013 questioned the legality of the informal limit, with the result that a total of 24 additional permits were approved. Limits were legally established per HAR 13-231-67 in September 2014.

Captains who do not consistently operate in resting bays typically travel for between 10 and 30 minutes to locate dolphins. Certain captains will communicate with each other regarding the location of the pods.

Once dolphins have been located, the operators generally spend about one hour of tour time facilitating the encounters. Of the four tours observed by research staff along the Kona Coast, three involved one or more guides who assisted the patrons in the use of snorkeling equipment, effective positioning, and spotting the dolphins. After the completion of the underwater dolphin encounter, most captains will move to a general snorkeling site and crew members will serve snacks or lunch.

As reported by vessel owners and operators, trip expenditures include: fuel, wages for crew members and other assistants, and food and drinks for the patrons. Fixed costs include: vessel maintenance, insurance, permits, and snorkeling equipment, among others. Table 2.3 and 2.4 below depict information regarding select vessel and operational characteristics among Kona-based businesses that facilitate underwater encounters.

Table 2-3 Characteristics of Fleet Providing Underwater Dolphin Encounters: Kona Coast, 2016-2017

Sample Size	Total Number of Vessels	Capacity Range (persons)	Average Vessel Capacity	Median Vessel Capacity
n=27	38	5-35	11.4	10

Table 2-4 Operational Characteristics of Underwater Dolphin Tours: Kona Coast, 2016-2017

Sample Size	Ave. Trips Per Day	Ave. Trip Fees per Patron*	Median Trip Fees	Range of Trip Fees
n=24	1	$147	$145	$99-216

*Fees charged to patrons reflect variation in: the kind of experiences offered by the operator; duration of the trip; translation services; among others.

Operational Tendencies of Kona Coast Retreat Businesses. Six local businesses offer dolphin-oriented spiritual retreats or seminars in individual and group settings along the Kona Coast. Additionally, a drug addiction treatment center offers clinical therapy involving underwater dolphin encounters. Three of these local businesses provide opportunities for non-resident retreat leaders to guide patrons through underwater dolphin encounters.

Although once a small category of tour operations, international demand for spiritually-oriented encounters with dolphins has grown considerably. Retreat leaders collectively report catering to guests from nations throughout much of Europe, the Americas, Asia, Africa, and Oceania.

Numerous retreats are hosted by leaders from the mainland U.S., Europe, Japan, South Africa, and Australia. Such persons have their own clientele and work out arrangements to bring them to Hawai'i and facilitate the dolphin experience, often in collaboration with a locally based tour and captains. Retreat leaders living on Maui and Kaua'i and along the windward side of the Big Island also reportedly bring patrons to encounter dolphins in the typically calm waters of the Kona Coast.

Retreats are advertised via both the internet and by word of mouth. An internet search conducted for purposes of the current project identified 33 non-local retreat operations offering spiritually-

oriented dolphin encounters along the Kona Coast. Resident retreat leaders confirmed these and provided the names of 12 additional non-local retreat operators.

For the majority of retreat owners/operators contacted in 2017, dolphins reportedly are central to the transformative experiences being offered. For others, dolphins reportedly are used partly as a marketing tool to attract customers to potentially engage not only in dolphin interactions, but other activities as well. These reportedly include: yoga, meditation, massage, reiki, qigong, channeling of guides/angels, and counselling, among others. Other activities are also facilitated, such as whale-watching, manta ray dives, volcano tours, and visiting peace gardens, parks, heiaus, coffee plantations, and farmer's markets.

Dolphin-focused retreat businesses offer vessel-based and/or shore-based access to dolphins. Shore-based access (swimming out from the beach) lowers the cost of the retreat, though areas where sheltered bays can be accessed without a boat tend to be crowded, and a relative lack of mobility (sans boat) means that underwater encounters cannot be guaranteed. Most retreat leaders offer at least one vessel-based tour as part of their repertoire. Table 2.5 provides information regarding modes of underwater dolphin encounters as reported by a total of 13 spiritual retreat facilitators active along the Kona Coast.

Table 2-5 Modes of Access to Underwater Dolphin Encounters Reported by Spiritual Retreat Leaders in 2017

Access Mode (n=13)			
Shore Only	Shore Primarily	Boat primarily	Boat only
2	3	2	6

Informants report that Kona Coast spiritual retreats tend to be relatively more active in the winter season, December through May. Notably, it is during this part of the year that patrons can also view and listen to the vocalizations of humpback whales (*Megaptera novaeangliae*), which frequent the region during their annual migrations from more northerly reaches of the Northern Pacific Ocean. This can be an additional draw for patrons.

Dolphin-oriented retreats vary considerably in terms of number of years in operation. At least one business has been active since 1989. The number of retreat held during the year prior to the interview ranged from 1 to 12. Retreats varied in length from 5 to 14 days, and the number of patrons ranged from 1 to 20.

Economic Aspects of Relevant Businesses on the Kona Coast

A total of 41 operations known to offer underwater dolphin encounters with spinner dolphins were identified along the Kona side of Hawai'i Island. Nine resident individuals lead or facilitate spiritual retreats. Field staff interviewed 24 commercial tour boat owner-operators, along with all resident and 8 non-resident spiritual retreat owner-operators. Field staff also interviewed three owner-operators of kayak operations, one dive-only operator, and two dolphin watch/snorkel operators. As none of these operators offered or promoted underwater dolphin encounters, they were not the primary subjects of the economic data collection process.

Gross Revenue. Tables 2-6 and 2-7 below depict gross revenues reported by owners or operators of commercial boat tours providing underwater encounters tours along the Kona Coast for the year prior to the study. The data do not include spiritual retreat-related revenue. Of note,

economic data from eight companies are not included in the figures below – owners and/or operators of these firms were either unavailable or unwilling to participate in this study. Based on archival and interview data, the eight firms that did not participate operate 11 vessels with a combined capacity of 181 passengers. The 21 business owners/operators who provided revenue data operated 29 vessels with a total combined capacity of 320 passengers.

Table 2-6 Gross Revenues Reported by Commercial Boat Tour Owners/Operators Providing Underwater Dolphin Encounters along the Kona Coast: 2016-2017

Sample Size	Fleet Gross	Average Gross Revenue	Median Gross Revenue	Gross Revenue Range
n=22	$ 5,404,757	$245,670	$155,250	16,800- 789,357

Table 2-7 Percentage Distribution* of Total Gross Revenues Attributed by Owners/Operators to the Underwater Dolphin Encounter Component of their Businesses: Kona Coast, 2016-2017

Sample Size	Less than 25%	25%-49%	50%-74%	75-100%
n=21*	4	7	7	3

*Sample sizes may vary between tables if a given respondent does not provide information for a given variable; in this case, one informant who provided gross revenue subsequently was unable to parse dolphin-specific revenue from that generated from other tour services he provides.

Table 2.8 below provides estimated gross revenues associated with retreats/counseling centers that offer underwater dolphin encounters along the Kona Coast. The amount of gross revenue generated by Big Island-based spiritual retreat businesses is generally inclusive of accommodations, tour fees (if boat encounters are provided), and some or all meals. Non-resident retreat leaders report that retreat costs generally cover flights, accommodations, and assorted activities while on island.

Table 2-8 Gross Revenues Reported by Spiritual Retreat Owners/Operators Providing Underwater Dolphin Encounters along the Kona Coast: 2016-2017

Type	Total Gross Revenue	Average Gross Revenue	Median Gross Revenue	Gross Revenue Range
Locally Owned (n=6)	$2,273,543	$378,924	$157,580	$47,920 -1,540,463
Operated by Non-Residents (n=8)	$388,611	$48,576	$37,407	$8,500 - $ 130,497

Employees and Wages. Interview data indicate that most tour operations that facilitate underwater dolphin encounters along the Kona Coast are relatively small (Table 2.9). This is logical in that fewer crew members are required to operate the smaller vessels that are characteristic of the local fleet. Additionally, numerous employees work on a part-time or seasonal basis. Owners and operators contacted during this study report that wages are generally paid on a per-tour rather hourly basis, though both arrangements occur. Relatively few crew members or assistants are salaried employees. Employees who support dolphin tour operations in the islands tend to be the same employees who support other aspects of the operation.

Detailed examination of the demographic attributes and residence patterns of employees who contribute to spinner dolphin tour operations is a study in itself.

Table 2-9 Employees and Hourly Wages among Operations Providing Underwater Dolphin Encounters along the Kona Coast: 2016-2017 (n=21)

Total Employees in Sample*	Average Number Employees	Wage Range for Captains**		Wage Range for Crew and Guides**	
		Hourly	Per Tour	Hourly	Per Tour
166	8	$19 - $25	$120 - $135	$12 - $14	$75 - $100

*Includes full-time, part-time, and seasonal employees; **Not including tips

Hawai'i Island's resident and non-resident retreat businesses provide income for vessel captains and mates; swim guides, photographers, caterers, speakers (who variously offer presentations on dolphins, Hawaiian history, hula, and lei making); massage therapists, and owners and operators of local accommodations. With regard to swim guides, retreat owners customarily hire guides to assist guests in the ocean and to ensure dolphin swim etiquette is followed. Hourly wages of between $15 and $37 are typical.

Customers Served Annually, and Patron Point of Origin. Facilitated underwater dolphin encounters, along with nighttime manta ray tours, generalized reef snorkeling, scuba tours, and seasonal whale watch tours comprise the five principal ocean-based eco-tourism opportunities available on the Big Island. In conjunction with the large charter fishing fleet that is active along the West Hawaii coastline and its offshore waters, these activities are the mainstay of Hawai'i Island's marine tourism industry.

As reported by research participants, underwater dolphin encounters are enjoyed by visitors from all over the world, including numerous visitors from Japan. In fact, four commercial tour companies solely or primarily serve a Japanese clientele. As noted above, non-resident retreat leaders from various parts of the world bring clientele from their home countries and elsewhere.

Tables 2.10 and 2.11 below depict the nature and extent of patronage among businesses providing underwater dolphin encounters along the Kona Coast. It should be noted that passenger numbers for commercial tour boat operations represent one tour per day, whereas numbers for retreats can represent patronage numerous days. Length of stay at Big Island retreats varies widely. Weekend and week-long stays are most common, though some visitors stay longer.

Table 2-10 Patronage among Commercial Boat Tours Providing Underwater Dolphin Encounters, Kona Coast: 2016-2017

Sample Size	Total Number of Passengers	Average Number of Passengers per Operation	Median Number of Passengers per Operation	Passenger Count Range, all Operations
n=23	40,066	1,742	1,200	168 - 5,300

Table 2-11 Patronage among Spiritual Retreats Facilitating Underwater Dolphin Encounters, Kona Coast: 2016-2017

Type of Operator	Approx. Total Patrons	Average Patrons Per Operation	Median Patronage	Patron Count Range
Resident-Owned (n=6)	1,222	204	225	24 - 350
Non-Resident (n=8)	322	40	18	3 - 200

Variation in Trip and Retreat Fees. As depicted in Table 2.12 below, fees paid by patrons to undertake commercial boat tours on Hawai'i Island were highest for those providing underwater dolphin encounters. In this case, fees reportedly vary in relation to expertise of the operator and guides, the target clientele, vessel amenities, and designated length of trip. Relatively high prices for snorkel tours at Kealakekua Bay reportedly relate to the cultural history and ecological attributes of the area.

Table 2-12 Trip Fees by Type of Commercial Boat Tour Activity, Kona Coast: 2016-2017

Type of Activity	Big Island Trip Fees		
	Average ($)	Median ($)	Range ($)
Underwater dolphin encounter (n=24)	148	145	99 - 216
Reef snorkeling with or w/o dolphin viewing from beyond 50 yds (n=9)	125	129	106 - 139
Manta viewing – snorkel (n=13)	109	105	87 - 175
Whale watching (seasonal) (n=9)	101	99	60 - 139

Range in retreat fees reflect differing costs for accommodations and modes of access for underwater encounters. Retreats also encompass a range of holistic experiences and in some cases, individual attention/treatment from the leader. See Table 2-13 below for information regarding fees for retreats and counseling center that provide underwater dolphin encounters.

Table 2-13 Spiritual Retreat Fees, Kona Coast: 2016-2017*

Type of Activity	Retreat Fees		
	Per Day Average	Per Day Mean	Per Day Range
Resident retreat (n=4)	$306	$322	$180 - 400
Non-/part-time resident retreat (n=8)	$374	$355	$223 - 516

* Retreats noted here include accommodations, meals, and transportation.

Respondent Perspectives on Regulatory Impacts and Alternatives

Here we provide a summary of respondent's stated views on the potential effects of public policies that are intended to protect spinner dolphin populations around the MHI. Respondents' perspectives on the likely nature of their reactions to a spatial buffer, and their ideas about other regulatory strategies are also discussed. The perspectives were elicited using a systematic approach and standardized cue. The data provide PIRO with an additional source of insight into perspectives of key stakeholders on the proposed spatial buffer and related management issues.

Effects of the Proposed Spatial Buffer as Reported by Boat Tour Operators. As depicted in Table 2.14 below, nearly all tour boat owners and operators who facilitate underwater dolphin encounters and who discussed potential regulatory impacts asserted the likelihood of a negative effect on their business operations.

Table 2-14 Reported-as-Likely Business Impacts of a 50 Yard Buffer, Kona Coast Tour Boat Owners and Operators: 2017 (n=17)*

Reported-as-Likely Effect	Frequency
Would go out of business	6
Would incur "major debt"	1
Would diminish overall profitability	3
Would devalue business, boat, and/or permit	3
Would impact ability to undertake planned expansion	1
Would diminish number of clients potentially available to engage in evening manta ray tours	1
Would have to lay off employees	3
Would have little impact	1

*Data derive from open-ended discussion of likely impacts.

Likely Reactions to the Regulatory Change as Reported by Boat Tour Operators. Respondents were prompted to describe operational changes they were considering in response to the proposed buffer. One participant reported that he would likely convert the operation's morning underwater dolphin encounter to a snorkeling trip. But three respondents expressed concerns about the fleet in general converting to snorkeling tours since it was felt that this could lead to further concentration of boats and swimmers in already crowded areas. Four operators reported that they did not think a morning snorkel tour would succeed, either because the activity was not deemed "sufficiently popular" or because the best snorkeling areas are too distant from their points of ocean access.

One respondent reported that he may attempt to move offshore to facilitate boat-based viewing of spotted and bottlenose dolphins. Other respondents reported that moving offshore would not be satisfactory for much of the fleet since: (a) only certain (large and/or well-suited) vessels would be able to undertake the venture on a regular basis; (b) the behaviors of the cetaceans in question and offshore environment do not lend to underwater encounters; and (c) the heavy ground swell and intense wind swell that characterize the offshore zone would raise safety concerns for patrons.

One respondent reported that he would likely diversify his operations by adding opportunities for scuba diving. Other respondents asserted that scuba generally has a limited market since patrons must possess special training and certification.

The option of switching from underwater activities to vessel-based viewing from a distance, in the manner of the Dolphin Watch program, was also discussed by various informants. But most claimed that such tours would be difficult to market, given their own belief that a 50 yard buffer would not enable suitable viewing opportunities of the relatively small cetacean. Two owner/operators who provide vessel-based dolphin viewing opportunities reported that the new regulations would constrain their operations since they customarily slow or stop their boats when encountering milling dolphins. A dive boat operator asserted that the dive industry could be impacted when dive sites coincide with dolphin resting areas.

Some respondents expressed doubts about the prospective effectiveness of the proposed spatial buffer, including concerns about the capacity of government agencies to enforce the policy.

Other concerns included: the (perceived as "fuzzy") wording of the ruling as this relates to captains' intent when approaching or encountering dolphins in transit; the potential inability of lay persons to accurately judge distance or respect regulations; and the feasibility of effective government enforcement of area closures. One respondent asserted that up close interactions between humans and dolphins would continue in certain areas irrespective of official policies.

Certain respondents noted that manta ray viewing policies currently under consideration by the State of Hawaii (c.f. Division of Boating and Ocean Recreation 2016) may prevent spinner dolphin tour operators from shifting to this activity as an economic alternative. Of note, approximately 12 business owners and/or operators participating in the current study reported that they could be concurrently impacted by pending manta ray and spinner dolphin regulations. One informant asserted that an additional five business owners who offer underwater dolphin encounters but who did not participate in the study could be affected by pending manta ray and spinner dolphin regulations.

Likely Effects of the Proposed Spatial Buffer as Reported by Spiritual Retreat Operators. As indicated in Table 2.15 below, the proposed buffer has the potential to affect directly persons involved in the provisioning of underwater dolphin encounters as part of spiritual retreats operated by locals and non-residents. The secondary support sector logically also would be impacted; this is comprised of accommodation purveyors, swim guides, facilitators, and vessel captains.

Table 2-15 Reported-as-Likely Effects of a 50 Yard Buffer, Kona Coast Spiritual Retreat Operators: 2017 (n=14)*

Reported-as-Likely Effect	Frequency
Would go out of business	5
Would create a different kind of retreat	2
Would move retreat off-island	8

*Data derive from open-ended discussion of likely effects.

It should be noted that seven retreat owners or facilitators interviewed during this study currently also operate retreats in other parts of the world, including cetacean-focused retreats in Tonga, Tahiti, Aruba, Mexico, and Mozambique. Others operate differing kinds of retreats elsewhere.

Regarding the perceived effectiveness of a 50 yard buffer, respondents generally were uncertain about the capacity of government agencies to adequately enforce the policy, and the likely effectiveness of shore-side signage. Additionally, certain respondents reported concerns that if the proposed buffer is enacted, tourists would continue to swim with dolphins but now in an uncontrolled environment.

During the interview process, many respondents gave thought to ways in which the industry would ideally be managed. As a result, the research protocol was amended to elicit such perspectives when respondents didn't voluntarily introduce the topic. As noted in the tables below, vessel operators focused on the idea of limiting entry into the industry and managing dolphin interactions at various times and places. Spiritual retreat leaders frequently referred to what they considered successful rules and systems implemented in other countries that permit underwater cetacean encounters, and vessel owner/operators frequently referred to rules currently being created by the community for the management of manta ray viewing. At the same time, there was recognition that measures are needed to limit the growth of the fleet,

particularly in certain presently crowded areas. There was also recognition that dolphins need to be protected, and that any human behaviors that negatively impact dolphins in the water column must be avoided.

Perspectives on Management as Reported by the Spiritual Retreat Sector. Numerous owners and operators of spiritual retreat businesses were keen to offer their perspectives on the management of underwater dolphin encounters. The perspectives were therefore consistently elicited and documented (Table 2-16), and the exercise was also implemented during discussions with boat tour owners and operators.

Guidelines said to be widely implemented at present in the spiritual retreat sector include: no overarm swimming, no above water kicking, no touching of dolphins, no swimming above dolphins when they are surfacing, and no chasing dolphins. Notably, a coalition of persons in the Captain Cook area is said to be building community consensus about how best to interact with dolphins so that disturbance is avoided.

2-16 Perspectives on Management as Reported by the Spiritual Retreat Sector in 2017 (n=14)

Ideas for Best Management	
Shore-based access	Frequency
Creation of shore-based kiosks to educate swimmers	3
Establishment of fee to support shoreside education	2
Wrist bands to identify swimmers that have received education	4
Partial bay closures	1
Underwater behavior	
Establishment of standardized dolphin swim etiquette	7
Mandatory viewing of video regarding dolphin swim etiquette	4
Mandatory use of swim guides with established ratio of guides to swimmers	2
Vessel operations	
Boating guidelines to lessen boat/swimmer density and crowding	1
Limitation on hours for morning tours	2
Establishment of boat permit system that would dedicate operators to certain areas	1

Perspectives on Management as Reported by Commercial Tour Owner/Operators. Many respondents in both the boat tour and spiritual sectors assert the need for measures that would ensure the economic vitality of their businesses while also enabling what for many is perceived as a unique inter-species relationship. While most recognize the practical challenges involved, there is also widespread interest in an interagency and inter-sectoral education campaign that would focus on new and developing knowledge about dolphin behavior, and tractable measures for precluding any detrimental impacts to the creatures. Many tour boat operators also call for measures that would limit expansion of the industry and require best practices certification.

2-17 Perspectives on Management as Reported by the Dolphin-Oriented Kona Coast Commercial Boat Tour Sector in 2017 (n=15)

Ideas for Best Management Broached by Interviewees	Frequency
Limit number of swimmers in water at any given time	1
Mandatory guide-to-swimmer ratio	2
Limit tours to before mid-morning	7
Limit amount of time each vessel stays with dolphins	1
Establish permit system limiting number of boats and/or companies (limited entry)	10
Create interaction guidelines and/or certification program for vessel operators	8
Limit number of boats allowed in any given area	1
Close certain areas for underwater dolphin encounters	2
Mandatory "swim" rules for all guests	2
Mandatory use of snorkel board for viewing	1

Kealakekua Bay, Hawai'i Island

Economic & Operational Aspects of Underwater Dolphin Encounters: O'ahu

This section describes relevant aspects of commercial tour businesses based on O'ahu. Owners and/or operators of six of the seven O'ahu-based spinner dolphin businesses were interviewed for purposes of the present study. Brief discussion of the physical settings where underwater spinner human-dolphin encounters are known to occur, and of the areas from which tour operations depart, is followed by description of the operations themselves. The section ends with a review of operators' perspectives on the present nature of the industry and ideas for diminishing any detrimental effects on cetaceans.

Human-Geographic Context

Ancient Hawaiians referred to O'ahu as "the gathering place." Contemporary O'ahu continues to be the primary point of arrival and departure for visitors, with nearly 5,462,000 persons travelling by air to the island in 2016, and some 4,146,000 remaining on the island for the duration of their stay in Hawai'i (DBEDT 2016).

The O'ahu economy is based primarily in tourism-related services. Much of this activity involves ocean-specific eco-tourism. For instance, according to a survey conducted by the Hawaiian Tourism Authority in 2015, 12.1 percent of domestic tourists participated in a whale watching tour during their visit. Similarly, 10.4% of Japanese tourists participated in such a tour, as did 11.7% of tourists from Europe, and 13.4% of tourists from Canada.

O'ahu, encompassed by Honolulu County, was home to an estimated 984,178 persons in 2015 (U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates). Population densities are high, with approximately 460 persons per square mile. Some 35 percent reside in urban Honolulu. The population of Wai'anae, on the leeward side of the island where most dolphin tour operations occur, was approximately 13,632 persons in 2015 (U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates). Operations are also conducted from Ko'olina, which is immediately adjacent to Wai'anae. Socioeconomic conditions along the Leeward Coast are challenging for many residents. Based on American Community Survey 5-Year Estimates, rates of poverty in the Wai'anae area were 28 percent in 2015, well above the national rate of 15.5 percent. There is, therefore, a notable degree of socioeconomic variability between tourists who visit the Leeward Coast and much of the resident populace.

Table 3-1 Select Demographic Data for O'ahu and Leeward Communities: 2015

Location	Population	Median Household Income	% Persons Below Poverty Line
State of Hawai'i	1,406,299	69,515	11.2
Honolulu County	984,178	74,460	9.7
Ko'olina	1,872	97,463	2.4
Wai'anae	13,632	60,345	28.0

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Commercial tour boat operations involving interaction with spinner dolphins are conducted along the leeward side of O'ahu, also known as the Leeward Coast. Visiting tourists land at the Honolulu International Airport. Many stay at resorts in Waikīkī, some 30 miles from Wai'anae. Resorts at Ko'olina are also popular with tourists, and new facilities in Kapolei also provide lodging alternatives.

Relevant Ocean Tourism Activities and Locations on O'ahu

Areas of Known Interaction and Primary Points of Departure of Commercial Boat Tours.

Underwater spinner dolphin encounters enabled by boat-based tour operations are known to occur in a variety of locations along the Leeward Coast (Map 3-1). These are as follows:

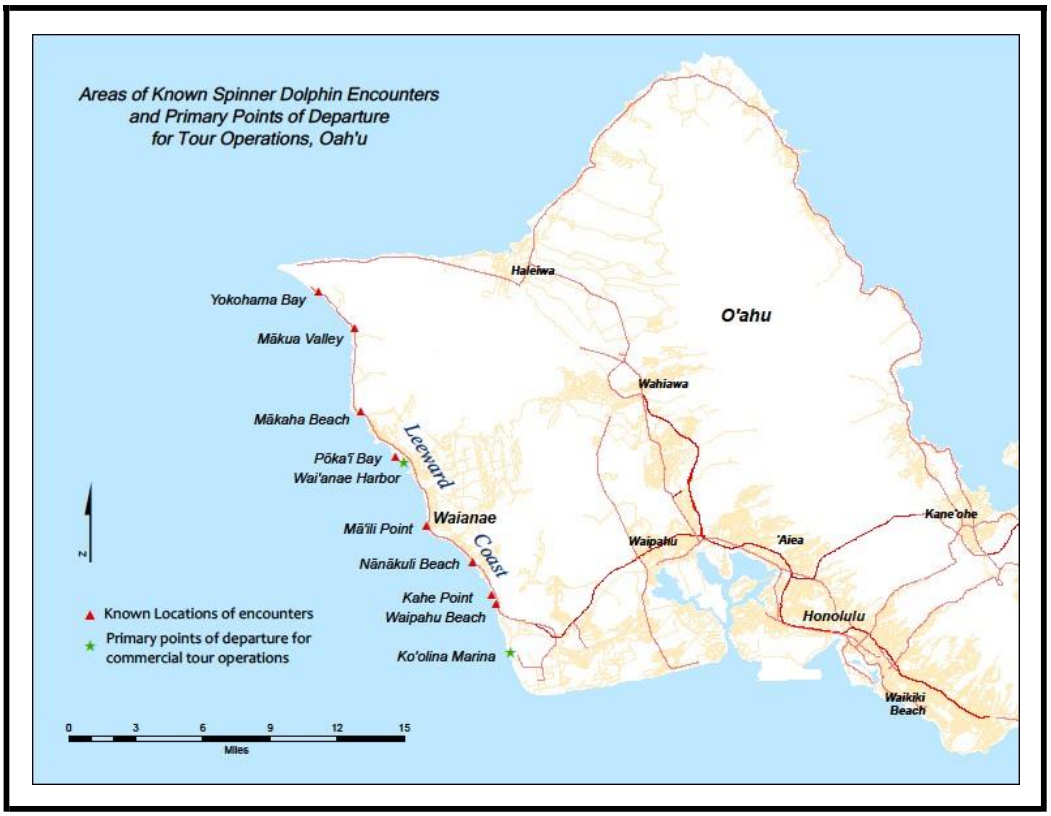
1) Yokohama Bay, located at the northern terminus of Farrington Highway on the far northwestern reaches of the Leeward Coast;
2) Mākua Bay, located roughly 7 miles north of Wai'anae and just south of Yokohama Bay;
3) Mākaha (point and bay), a popular surfing break, located two miles north of Wai'anae;
4) Pōkaʻī Bay, an historic ocean access area, located adjacent to Wai'anae Harbor and about 30 miles from Waikīkī;
5) Mā'ili Point, a popular surfing break, located approximately five miles south of Wai'anae;
6) Waipahu Beach/Nānākuli, located roughly eight miles northwest of Makakilo City and some 25 miles from Waikīkī; and
7) Kahe Point, also known as Electric Beach/Power Plant, located about three miles south of Nānākuli.

Commercial tour boat operators enabling interaction with spinner dolphins along the Leeward Coast are based at either the state-operated Wai'anae small boat harbor or the privately-owned Ko'olina Marina. Six firms offering underwater dolphin encounters were based at Wai'anae at the time of this study. Harbor facilities here include 109 berths, seven access ramps, and the harbor office.

One tour company operates from Ko'olina Marina. This facility can accommodate vessels up to 150 feet in length and maintains 330 full-service slips, a restaurant, and a fuel dock. Guests staying at Ko'olina Resort comprise a large portion of patrons on tour vessels operating from this marina. Shore distances between Ko'olina Marina and dolphin viewing areas reduce transportation costs for vessel operators.

Eco-tourism activities are increasingly popular along the Leeward Coast of O'ahu. The clarity of the nearshore water is appealing to divers and snorkelers. Swells can affect recreational boating, but wind waves typically are minimal, since the prevailing trade winds blow offshore along the leeward side, smoothing the ocean surface to a glass-like condition.

Numerous white sandy beaches and areas of coral interspersed with sand in the nearshore zone afford a pleasant experience for swimmers, surfers, snorkelers and other recreationists who frequent such areas along the Leeward Coast. Calm bays also appear to attract spinner dolphins and persons who wish to view them. Larges stands of coral reef in adjacent zones support various reef fishes and other sea life. Finally, the green pali (sheer cliffs) of the Wai'anae Range soar above these settings, creating what some term “breathtaking scenery.”



Map 3-1 Areas of Known Spinner Dolphin Encounters and Primary Points of Departure for Tour Operations on O'ahu

Operational Tendencies of Commercial Boat Tours. The fleet that presently offers underwater dolphin encounters along the Leeward Coast includes: rigid inflatable vessels (from ~35 to 45 feet LOA) and single and double deck catamarans. The tour companies exhibit varying degrees of operational diversity. Three offer differing types of marine tours, including "sandbar tours," whale watching, sunset tours, and snorkel only. Three also offer tours/adventures on land, and one conducts a variety of activities on both O'ahu and Hawai'i Island. All firms provide transportation to and from Waikiki and/or Ko'olina, and each retains an on-board photographer. Four companies retain Japanese translators since many patrons are from Japan.

The rapid growth of eco-tourism in the early 2000s, ensuing conflicts with local fishermen who primarily target akule[28] in the nearshore zone, and state agency concerns about the potentially adverse impacts of tours on spinner dolphins resulted in a House Concurrent Resolution that led to a 2005 moratorium on new commercial use permits in Leeward Coast small boat harbors (Tetra Tech 2009).[29] The size of the fleet has not increased in recent years, and subsequent to our 2007 study, one business ceased offering underwater dolphin encounters.

Spinner dolphin tour businesses active along Leeward O'ahu offer morning and early afternoon trips. The progression of tour events for O'ahu-based companies is similar to that of tours conducted along the Kona Coast, with a few notable differences. Most patrons arrive at the

[28] Akule or big-eyed scad (*Selar crumenophthalmus*) constitute an important food source for many local residents.

[29] As of 2014, commercial use permits for state waters are regulated irrespective of point of origin.

vessel staging area after a shuttle bus ride from Honolulu. The ride takes approximately 40 minutes. During this time, crew members speak with the guests about the tour activities, the dolphins they will be observing, and appropriate snorkeling protocol. Six of the seven operators depart from Wai'anae Harbor, and generally try to stagger their departure times to reduce congestion. When captains do arrive concurrently, they typically also arrange for staggered viewing of the dolphins.

O'ahu-based operators require that guests wear flotation devices during underwater encounters. This effectively prevents guests from diving and impedes swimming-related movements, both of which are thought to disturb the cetaceans. These practices are followed through an informal agreement. Tours are not conducted during stormy conditions, or during large swell events, which are common in winter.

As is the case along the Kona Coast, after completing the dolphin encounter, tours will move to a site where patrons engage in general snorkeling activities. Food is served to those who remain onboard. Catamaran vessels have the capacity to carry a variety of ocean sports gear, including stand-up paddle boards and kayaks.

Major expenditures reported by O'ahu-based vessel owner/operators include: hotel and booking agent fees, fuel, wages, catering, and maintenance of buses and vessels. Two respondents reported that booking fees range from 20 to 35 percent of the ticket price. Tables 3.2 and 3.3 provide select information regarding the local fleet.

Table 3-2 Characteristics of the Fleet Providing Underwater Dolphin Encounters along the Leeward Coast of O'ahu: 2016-2017 (n=6)

Total Businesses Operating	Average Vessels per Business	Capacity Range (persons)	Average Vessel Capacity	Median Vessel Capacity	Mean Number of Support Vehicles*
7	1.5	22-45	34	35	2.7

*These tours include a shuttle service from Honolulu to leeward staging areas – typically a ~40-minute drive.

Table 3-3 Operational Characteristics of Underwater Dolphin Tours, Leeward O'ahu: 2016-2017 (n=6)

Ave. Trips per Day	Ave. Trip Fees per Patron	Mean Trip Fees	Trip Fee Range
2	$134	$134	$109-156

Economic Aspects of Relevant Businesses on the Leeward Coast

In addition to six of the seven businesses known to offer underwater dolphin encounters with spinner dolphins on O'ahu, field staff also contacted one owner-operator of a kayak operation located in Waianae. The operator led general vessel-based wildlife viewing and therefore was included in the economic data collection process. No spiritual retreats involving underwater dolphin encounters were identified on O'ahu in 2017. Fieldwork led to the identification of a guide who occasionally brings visitors to resting bays to view dolphins. It was not made clear whether this constituted an official business, and thus the resulting data were not included in the study.

Gross Revenue. Table 3.4 below depicts gross revenues generated and reported by owners and operators of businesses offering underwater dolphin encounters along the Leeward Coast of O'ahu in 2017.

Table 3-4 Gross Revenues Reported by Commercial Tour Boat Owners/Operators Providing Underwater Dolphin Encounters along the Leeward Coast: 2016-2017 (n=6)

Total Gross Revenue	Average Gross Revenue	Median Gross Revenue	Gross Revenue Range
$11,511,809	$1,918,635	$1,935,000	$999,999-2,971,810

Employees and Wages. Interview data regarding number of employees indicate that most tour operations offering underwater dolphin encounters along the Leeward Coast of O'ahu are larger than those along the Kona Coast of Hawai'i Island (see Table 3.5 below and Table 2.10 above). Numerous crew members are required to serve the larger capacity vessels that are characteristic of the O'ahu-based fleet. Four and five crew members per trip are common. Additional employees are also hired to provide transportation from Waikiki and Ko'olina, and to provide translation to the relatively large number of Japanese patrons.

Table 3-5 Employees and Hourly Wages among Boat Tours Providing Underwater Dolphin Encounters along the Leeward Coast: 2016-2017 (n=6)

Mean Number of Employees	Wage Range Captains*	Wage Range Crew*	Wage Range Shuttle Drivers*
22	$15-30/hr.	$12-16/hr.	$9.25-20/hr.

*Not including tips

Customers Served Annually, and Patron Point of Origin. Table 3.6 below depicts patronage among commercial tour boat operations that provide underwater dolphin encounters along the Leeward Coast. While patrons as a whole hail from points of origin around the world, especially North America and Europe, owners of two companies report that they cater primarily to Japanese patrons.

Table 3-6 Patronage among Commercial Boat Tours Providing Underwater Dolphin Encounters along the Leeward Coast: 2016-2017 (n=6)

Approx. Total Patrons	Avg. Annual Patrons	Median Annual Patrons	Annual Patron Range
88,457	14,743	15,000	8,33-21,124

Variation in Trip Fees. As indicated in Table 3.7 below, fees associated with tours offering underwater dolphin encounters along the Leeward Coast are considerably higher than those for charged for more generalized boat tours operating from Waikiki. Variation within each business category in this case tends to relate to the type of vessel, duration of time on the ocean, and type of food provided.

Table 3-7 Leeward Coast Trip Fees* by Type of Activity, Dolphin Fleet: 2016-2017

Type of Activity	Trip Fees $		
	Average	Median	Range
Underwater dolphin encounters (n=6)	134	134	109 - 156
Vessel-based dolphin watch (n=3)	126	111	66 - 225
Turtle/fish reef snorkel (n=6)	97	90	39 - 185
Whale watch (seasonal) (n=5)	70	70	37 - 119
Shark watch (n=3)	128	120	115 - 150
Non-certified diving activities (n=3)	138	99	99 - 216

Respondent Perspectives on Regulatory Impacts and Alternatives

The following sections summarize respondents' views on the potential effects of public policies that are intended to protect spinner dolphin populations around the MHI. Perspectives on likely reactions to the proposed spatial buffer and other regulatory strategies are also discussed.

Effects of the Proposed Spatial Buffer as Reported by Boat Tour Operators. As indicated in Table 3.8 below, respondents report the potential for economic impacts should a 50 yard buffer be established to protect the cetaceans.

Table 3.8 Reported-as-Likely Business Impacts of a 50 Yard Buffer: Leeward Coast Tour Boat Owners and Operators, 2017 (n=6)

Reported-as-Likely Impact	Frequency
Go out business	2
Temporary loss of business but will recover	1
Loss of business already noted	3
Devaluation of investment in vessel	1

Four Leeward Coast respondents reported that they have already developed a plan for responding to the prospective regulatory change. One stated that he has purchased an observation platform that will both enhance the dolphin viewing experience and increase the overall capacity of his vessel. Another business owner plans to expand the amount of tour time allocated to snorkeling, other water sports, and on-board dining. He also intends to expand his operations by developing hiking opportunities and customized tours. Much of this diversification was planned to provide options to the existing customer base during bad weather but is now also anticipated to reduce potential regulatory impacts moving forward. A third business owner is also diversifying for various reasons and has initiated a land-based tour that he believes would reduce the effects of prospective new regulations on underwater spinner dolphin tours. A fourth business owner is considering the possibility of modifying and moving his tour operation to the North Shore where there is less competition. This would require a different focus since spinner dolphins are not readily observable in North Shore waters. Two respondents stated that they intend to challenge the proposed regulations through litigation and lobbying.

The concept of switching to vessel-based dolphin encounters and/or focusing on snorkeling activities is untenable for two of the Leeward Coast business owners. One asserts that the 50 yard no-approach rule would not allow a suitable dolphin viewing experience for his patrons, at least from his vessels. The second asserted that he would not be able to compete with snorkel tours and the lower prices available for such tours in Waikiki.

Perspectives on Management of Human-Dolphin Interactions. Regarding informant perspectives on the proposed spatial buffer, one respondent on O'ahu expressed concerns that underwater dolphin encounters will continue to be pursued by individual boaters and swimmers regardless of any new regulatory strategy. Two respondents suggested that the proposed spatial regulation lacked sufficient clarity in terms of how and at what distances vessel operators could allowably react to resting or transiting spinner dolphins. That is, the informants felt that it would be difficult for enforcement officials to objectively judge the intent of vessel operators who happen upon dolphins that suddenly surface in resting bays or suddenly appear in their bow-wakes on the open ocean. With regard to informant's perspectives on best management practices, business owners commonly asserted the value of: (a) educating swimmers on how to avoid disturbing dolphins, and (b) ensuring that vessel captains and guides receive training and certification prior to facilitation of underwater dolphin encounters. Three operators expressed the perspective that scientific research did not clearly justify implementation of a 50 yard buffer.

Dolphin Tour Vessel at a Leeward Anchorage, Summer 2017

Relevant Aspects of Commercial Boat Tours around Maui

Given the potential for economic impacts to accrue to Hawai'i businesses that facilitate encounters with spinner dolphins in the water column, the current study has focused especially on this sector of the industry. While ocean conditions and local social norms[30] reportedly have *not* fostered the growth of such activity in the waters around Maui and Kaua'i, ocean tour vessels do encounter spinner dolphins around these islands and such operations are described in the following pages for that reason. The description focuses especially on basic characterization of vessel-based dolphin encounters, and respondent perspectives on the proposed spatial buffer and its potential effects on vessel-based encounters and related marketing processes.

Of note, archival research undertaken as part of this study has indicated that certain Maui-based spiritual retreats offer vessel-based dolphin encounters. But fieldwork has made clear that local retreat operators travel to the Kona side of Hawai'i Island to facilitate such activities. Such persons were not included in the Maui portion of the current study.

Human-Geographic Context

Maui is located 30 miles northwest of Hawai'i Island across the 'Alenuihāhā Channel, and 9 miles east of Moloka'i across the Pailolo Channel. The estimated 2015 population of Maui County was 160,863 persons ((U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates). Maui County encompasses Maui, Moloka'i, Lāna‘i, and Kaho'olawe. Maui is the second largest island in the chain, encompassing over 1,159 square miles of land. The population density is roughly 111 persons per square mile. Much of the eastern and upland portions of the island are sparsely populated. Kahului, Kīhei, Wailuku, and Lahaina are the principal population centers, with respective year 2015 populations of 28,476; 22,401; 16,064; and 12,118 persons.

Numerous oceanfront resorts and tourist services are available along the West Maui coastline. These are also scattered around Kīhei. Most visitors arrive at the Kīhei International Airport, some 20 miles northeast of Lahaina. DBEDT (2016) reports that over 2,540,000 persons travelled by air to Maui in 2016. According to the Hawaiian Tourism Authority’s 2015 Visitor Satisfaction & Activity Report, 31.7% of domestic tourists participated in a whale watching tour during their stay on Maui, with 9.8% of tourists from Japan, 27% of tourists from Europe, and 29.7% of tourists from Canada similarly engaging in whale watching tours. These figures are provided as general indications of visitor interest in marine eco-tourism –similar figures are not available for spinner dolphin tours.

Lahaina and Kā'anapali are popular tourist destinations in the West Maui region. Numerous ocean recreation opportunities are available from Mā'alaea Harbor on the southernmost portion of West Maui, and from Lahaina, the capital city of old Hawai'i. Charter fishing and commercial based in both locations tour boat operations periodically encounter spinner dolphins, especially on the leeward West Maui coast. Many visiting tourists patronize these businesses as they make half- and full-day ocean recreation and sightseeing forays from their places of lodging in Lahaina, Kā'anapali, Kīhei, and elsewhere on the island. West Maui and southwest portions of

[30] The evolution and nature of social norms regarding treatment of cetaceans, and how such norms may vary between islands and island communities constitutes a study in itself.

East Maui (such as around remote La Perouse Bay – see map) are leeward coastlines and hence favorable for boating, snorkeling, and other ocean activities. Table 4-1 below provides basic demographic data for the main population centers on Maui.

Table 4-1 Select Demographic Data for Maui's Main Population Centers: 2015

Location	Population	Median Household Income	% of Persons Below the Poverty Line
State of Hawai'i	1,406,299	69,515	11.2
Maui County	160,863	66,476	11
Kihei	22,401	64,747	9.6
Lahaina	12,118	67,362	9.3
Kahului	28,476	66,625	11.5
Wailuku	16,064	69,768	12.7

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Relevant Ocean Tourism Activities on Maui

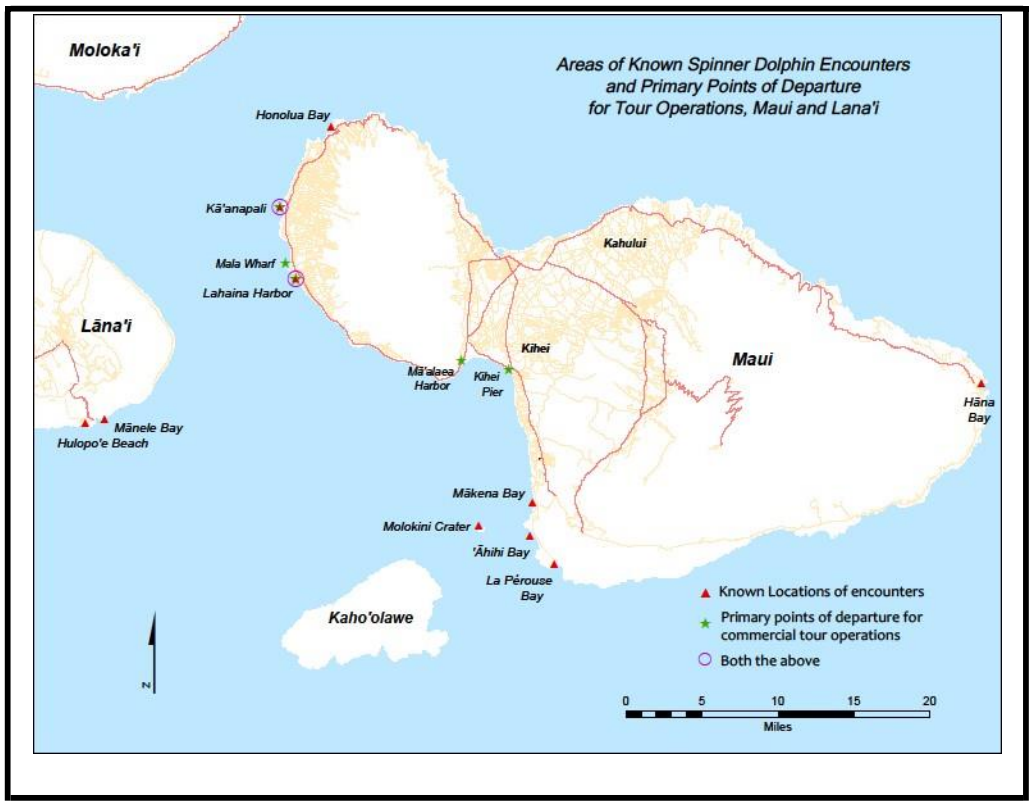
Areas of Known Interaction and Primary Points of Departure for Commercial Boat Tours.
Tour boat operations that advertise and/or occasionally involve encounters with spinner dolphins are conducted in numerous locations along West Maui and portions of southwest Maui (Map 4-1). Limited operations sometimes also occur at remote Hāna Bay and La Pérouse Bay along East Maui. Some captains explore 'Au'au Channel between Maui and Lāna'i, and the bays along the coastline of Lāna'i. As Maui is closest to Lāna'i than other adjacent islands, Maui-based operators are the source of commercial boat tours around that neighbor island. Vessel-based encounters between humans and spinner dolphins are known to occur primarily at, or *en route* to, the following locations:

1) Honolua Bay, also a popular surfing break, located ~14 miles north of Lahaina;
2) Kā'anapali, located some 5 miles north of Lahaina and just south of Kapalua;
3) Around Lahaina Harbor, which is located 21 miles west of Wailuku across the West Maui Mountains;
4) Hulopo'e Beach and Mānele Bay along the southern coastline of Lāna'i;
5) Mākena Bay, ~10 miles south of Kīhei;
6) Molokini Crater, a popular snorkeling destination ~3 miles east of the Mākena-La Pérouse Bay State Park (dolphins are often seen *en route*);
7) 'Āhihi Bay, located between Mākena and La Pérouse Bays;
8) La Pérouse Bay, five miles south of Mākena, amid a rugged volcanic landscape.

Commercial vessel operators advertising vessel-based dolphin encounters operate from the following harbors and launch ramps:

1) Kā'anapali Beach;
2) Māla Wharf and ramp;
3) Lahaina Harbor;
4) Mā'alaea Harbor; and
5) Kīhei boat ramp.

Vessels operating from Kā'anapali Beach tend to travel to the north side of the island. Those operating from Kihei boat ramp and Mā'alaea Harbor tend to travel to Molokini and/or the south-west coast.



Map 4-1 Areas of Known Spinner Dolphin Encounters and Primary Points of Departure for Tour Operations: Maui

Operational Tendencies of Commercial Boat Tours on Maui. Based on the results of archival and field research conducted for purposes of the current study, 28 tour businesses are known to advertise spinner dolphin encounters and/or encounter them as the vessels transit to or arrive at their destinations. An additional three businesses operate in areas where spinner dolphins are known to occur, but do not utilize dolphins in their marketing efforts. Two local operators participate avidly in NOAA's Dolphin SMART program.

Researchers involved in this project used a combination of archival research and the recommendations of public officials and business peers to identify a subset of Maui-based tours that were most likely to regularly encounter and/or interact with spinner dolphins. Owners of the firms were then contacted by email and subsequently interviewed to develop an up-to-date understanding of Maui operations, to gain an understanding of owners and operators' perspectives on the potential effects of a 50 yard buffer, and to gauge perspectives on related matters.

In contrast to the situation among tour boat operators on Hawai'i Island and O'ahu, it was found that many Maui-based business owners were not well-informed about the prospective regulations. Field staff contacted 21 businesses and interviewed 15 individuals representing 16 businesses. One business owner declined to participate, and five businesses did not respond to our inquiries.

NOTE: Despite repeated efforts on the part of the research team, an insufficient number of Maui operators provided detailed economic information about their operations to allow for reporting under the 'rule of three' (which, as specified in section 402 (b), 16 U.S.C. 1881a, of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, safeguards proprietary business information and the well-being of business owners).

An estimated 58 vessels comprise the contemporary Maui-based fleet whose operators advertise or report the encounters with spinner dolphins. The fleet consists of a range of vessels, including basic center consoles, rigid inflatables, single and double decker catamarans, and mono-hull sailing vessels. The largest vessels operate from Kā'anapali Beach, Lahaina, and Mā'alaea Harbor. Smaller vessels tend to operate from Māla Wharf and ramp, and from Kihei.

Information regarding fleet characteristics is provided in Table 4.2 below.

Table 4-2 Characteristics of Commercial Tour Businesses Advertising or Reporting Vessel-Based Dolphin Encounters around Maui in 2017 (n=28)

Total Number of Tour Vessels	Vessel Capacity Range	Average Capacity	Median Capacity
58	6 – 149 persons	37 persons	49 persons

The boat tour companies operating around Maui exhibit various degrees of diversification. All operators offer whale watching tours during the winter months. This is the mainstay of many Maui tour operations. Tours offered on large vessels typically involve sunset viewing and dinner, and tours offered by large catamarans typically involve a variety of recreational activities, live music, and dining. Four companies advertise sport fishing options.

The possibility of vessel-based dolphin encounters is widely marketed. Such encounters can be intentional in the sense that captains search for and change navigational course to enable guests to observe the creatures, or they may be more unintentional, and routine – in the sense that captains can be fairly assured that during their regular course of transit, dolphins will be encountered and attracted to play in the wake of the vessel. The term "dolphin chasers" is regularly used by tour marketers to indicate operations that encourage or frequently have dolphins interacting with the vessel's bow wake.

The degree to which dolphin encounters are central to marketing and operations tends to vary by location. Research participants report that morning tours that depart from Lahaina Harbor and Māla Wharf/Ramp for Lānaʻi have the highest probability of encountering dolphins *en route*.

One operator guarantees such encounters for his Lahaina-Lā-naʻi tour. Other operators advertise a high percentage likelihood that dolphins will be encountered. Tour boats traveling to Molokini, Makena Bay, and Honolua reportedly have a lower probability of encountering spinner dolphins. Many firms will typically advertise "occasional" encounters or note that the tour takes place in and/or travels through "dolphin habitat."

Three different kinds tours to Lānaʻi are offered: (1) circumnavigation of the island with multiple snorkel stops; (2) a traverse of the east and south coastlines with snorkel stops; and (3) a landing on the island, with guided or unguided snorkeling at Hulopo'e Bay and Marine Preserve. Spinner dolphins frequent Hulopo'e Bay, and although signs request that people do not swim with or disturb the animals, beach staff report that tour patrons frequently snorkel out to interact with the pods when present.

Seven vessel operators from Maui asserted that they frequently slow or stop their vessels either to allow guests to observe dolphins and/or out of safety concerns as guests are drawn to view the cetaceans from the bow. Operators report minimal concern for the well-being of the dolphins in this situation since it is widely known that the creatures are so agile when swimming as to be rarely harmed by any given vessel. Some operators report that they trade information about the location and movement of dolphins. Others avoid this practice. Much like fishermen, willingness to trade information depends in large part on the potential for reciprocal exchange, and the likely validity of the information itself.

As noted above, commercial boat tour operations on Maui reportedly do not advertise or offer *underwater* encounters with spinner dolphins. But reportedly unplanned or unintentional underwater encounters apparently do occur. Indeed, certain operators reported that they have allowed guests to enter the water when a pod of dolphins is in the vicinity, and others reported that dolphins will sometimes pass through when snorkelers are already in the water and/or when vessels are already moored in certain areas.

Table 4.3 provides fees for Maui-based tours that advertise and/or report vessel-based dolphin encounters. Fees vary in relation to location, vessel size and amenities provided, and length of tour. Most tours are half-day tours.

Table 4-3 Trip Fees for Commercial Tour Boats Advertising or Reporting Vessel-Based Dolphin Encounters along the Maui Coastline in 2017 (n=27)

Ave. Trip Fee per Patron	Median Trip Fee	Trip Fee Range
$123	$130	$47 - 205

Respondent Perspectives on Regulatory Impacts

The following summarizes respondents' views on the potential effects of public policies intended to protect spinner dolphin populations around the islands. Perspectives regarding likely reactions and best regulatory strategies are also discussed. Of note, the interview methodology in this case was open-ended in nature, allowing respondents to discuss perspectives they deemed most salient. Respondents who offer tours to Lānaʻi, described a variety of potential outcomes that in their view could follow from the proposed buffer (Table 4.4 below).

Zodiac-Type Dolphin Tour Vessel, 2017

Table 4.4 Reported-as-Likely Impacts of a 50 Yard Buffer: Maui Tour Boat Owners and Operators Offering Trips to Lāna'i in 2017 (n=25)

Reported-as-Likely Impact	Frequency
Would generate no or little negative effect	4
Would have to find a different market niche	1
Customer experience would remain the same	2
Would lead to some negative impact	1
Would pose a hindrance to navigation	1
Would cause detrimental economic impacts	4
Would generate a loss of marketability	4
Would not allow for a satisfactory viewing experience	4
Would lead to citations	2
Would generate positive impact	1
Would bring customers displaced from underwater experiences along Kona Coast	1

Notably, two business owners who operate Molokini and Honolua tours asserted that they would not be able to quickly establish or maintain the required buffer should dolphins swim into existing mooring and snorkeling areas.

Five respondents expressed concerns that a 50 yard buffer would be difficult to enforce. One expressed his perspective that the rule was "cut and paste" from humpback whale regulations and unsuitable given differing species behaviors. Yet another respondent felt that the rule would not be effective for patrons already in the water because they would not be able to accurately judge or adjust their actual distance from swimming dolphins. Finally, one respondent expressed concerns that the larger ecosystem could be affected by the proposed spatial buffer. He asserted that tours could subsequently focus on, and disturb, spotted dolphins on the kona side of Lānaʻi.

A Basic Summer Snorkel Tour in Scenic Honolua Bay, West Maui

Relevant Aspects of Commercial Boat Tours around Kaua'i

This section describes select aspects of commercial tour businesses that enable vessel-based dolphin encounters along the coastline of Kaua'i. We begin with an overview of the settings where human-dolphin interactions are known to occur, and points of departure for commercial tours. This is followed by brief description of the operational tendencies of the fleet. The discussion concludes with a summary of respondents' views regarding the potential impacts of the proposed spatial buffer.

Human-Geographic Context

Kaua'i is the northernmost of the MHI. It is also the fourth largest of the main islands, encompassing some 622 square miles of primarily volcanic terrain. Kaua'i's Mt. Wai'ale'ale is the wettest spot on earth. Lush mountainous areas and broad sandy beaches attract tourists from around the world. Numerous boat tour operations transport sightseers along the rugged Nā Pali coastline when swell conditions are amenable to such activities. The Nā Pali coast faces northwest into swells emanating from winter storms in the North Pacific.

With the exception of scattered centers of population and a variety of resorts and associated subdivisions, much of Kaua'i is characteristically rural in nature. The estimated population density for 2015 was 113 persons per square mile. Kapa'a is the largest town. Its 2015 estimated population was 10,794 persons. Waimea, a small town located along the southern shoreline, had a year 2015 estimated population of 1,690 persons. The year 2015 estimated population of Hānalei was 210 persons.

Ni'ihau is located some 17 miles west of Kaua'i across the Kaulakahi Channel. The privately-owned island is inhabited primarily by Native Hawaiians. The island encompasses 70 square miles of rugged terrain, and 45 miles of coastline.

1,187,476 persons travelled by air to Kaua'i in 2016 (DBEDT 2016). According to a survey conducted by the Hawaiian Tourism Authority, 2015 Visitor Satisfaction & Activity Report, 25.5% of US tourists participated in a boat/submarine and whale watching tour during their stay on Kaua'i. Participation for other tourists ranged from 11.1% for tourist from Japan, 21.6% for tourists from Europe, and 26.8% for tourists from Canada. These figures are intended to indicate general interest in marine-based tourism. No such figures are available to indicate visitor patronage of spinner dolphin tours.

Visitors to Kaua'i land at Līhu'e airport and may find lodging at resorts located primarily along the southeast or northern shorelines of the island. Many boat tour operations tend to focus on the Nā Pali experience. Subsequent to establishment of state regulations in 1998 that limited the number and type of operations conducted from Hānalei Bay on Kaua'i's north shore, most vessels now depart for Nā Pali tours from the Port Allen and Waimea areas.

Field and archival research indicate that at least two businesses offer vessel-based dolphin encounters and/or healing sessions in dolphin habitats. Initial research indicates that the operations do not involve underwater activities.

Table 5-1 Select Demographic Data for Kauai's Main Population Centers: 2015

Location	Population	Median Household Income	% of People Below Poverty
State of Hawai'i	1,406,299	69,515	11.2%
Kaua'i County[31]	69,691	65,101	10.7%
Lihue	7,360	59,640	14.3%
Kapa'a	10,794	63,609	13.3%
Hanalei	210	41,563	13.8%
Elelee (Port Allen)	2,604	68,750	11.2%
Kekaha	2,915	55,833	5.4%

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Relevant Ocean Tourism Activities and Locations on Kaua'i

Areas of Known Interaction and Primary Points of Departure for Commercial Boat Tours.

Vessel-based encounters reportedly occur during Kaua'i boat tour trips that involve a wide range of snorkeling and/or sightseeing activities. Encounters between tour operations and spinner dolphins are known to occur at, or *en route* to the following locations on Kaua'i (see Map 5-1 below):

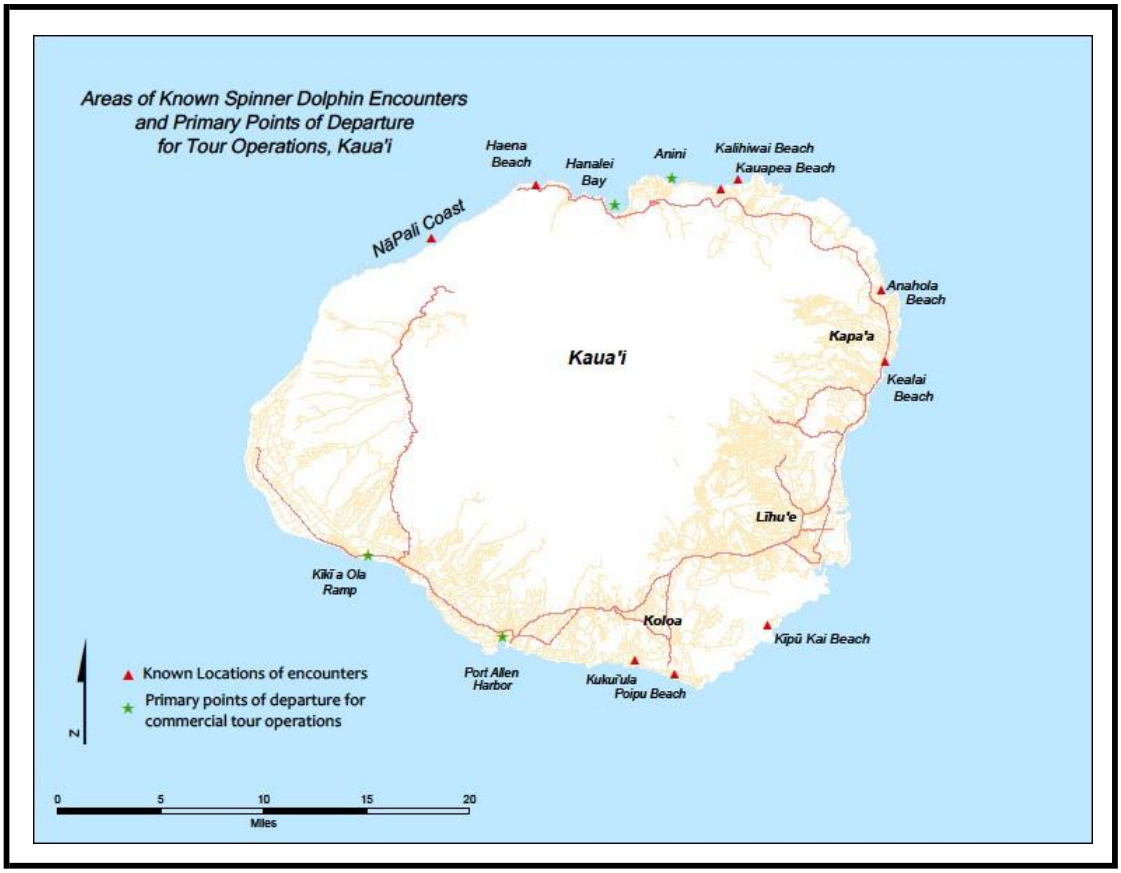
1) Hānalei Bay, a popular surfing area, located on the north shore of the island roughly five miles west of Princeville and some 30 miles northwest of Līhu'e,
2) Po'ipū Beach Park, a popular surfing area, located on the southern tip of Kaua'i, 14 miles south of Līhu'e and 19 miles east of Waimea;
3) Kīpū Kai Beach, accessible only be boat and approximately five miles south of Līhu'e;
4) Nā Pali Coast, known for dramatic sea cliffs, along the northwestern coast of Kaua'i; and
5) Lehua Crater, a remnant volcanic tuff cone location about one mile north of Ni'ihau.

Known shore access points for occasional underwater dolphin encounters include the following beaches on the east and north shore of the island: Kealia Beach, Anahola Beach, Kauapea Beach, Kalihiwai Beach, and Haena Beach. Commercial tour boat operators enabling vessel-based encounters with spinner dolphins along the Nā Pali Coast are based at Port Allen and Kīkī a Ola small boat harbor on the south coast, and at Hanalei Bay and Anini ramp on the north coast.

Certain operators who conduct boat tours on south shore advertise occasional dolphin encounters These operations are based at Kukui'ula small boat harbor.

The Nā Pali coast is the most popular and heavily advertised area for vessel-based dolphin encounters on Kaua'i. Operators report that the existence of a large resident pod of spinner dolphins enhances the odds for dolphin encounters at some point during the 17-mile roundtrip tour. One Port-Allen based operator guarantees dolphin sightings on all morning tours. One operator is a member of NOAA's dolphin SMART program.

[31] Kaua'i County encompasses the island of Ni'ihau.



Map 5-1 Areas of Known Spinner Dolphin Encounters and Primary Points of Departure for Tour Operations on Kaua'i

Operational Tendencies of Commercial Boat Tours. Based on archival and field research conducted for purposes of the present study, approximately 23 companies utilizing 42 vessels advertise, incorporate, or regularly experience vessel-based dolphin encounters during their tours around Kaua'i. But as noted previously, none of the tours facilitate underwater encounters with dolphins.

Field staff contacted 21 businesses, though six did not reply to our inquiries. Interviews were conducted with 15 respondents representing 17 companies. Diving operations and fishing charters known to encounter dolphins were not included in the study.

Tour companies advertising or reporting vessel-based dolphin encounters around Kaua'i primarily use rigid inflatables, motorized catamarans, and catamaran-style sail boats. The fleet is comprised of both moored and trailered vessels. Small rigid inflatables and catamarans accessing the Nā Pali coast typically operate primarily out of Kīkī a Ola harbor and boat ramp, and occasionally from Hanalei Bay. The larger catamarans utilize facilities at Port Allen. Two companies that offer south coast snorkel tours market the possibility of seeing dolphins. Fleet characteristics are summarized in Table 5.2.

Table 5-2 Characteristics for Commercial Tour Businesses Advertising or Reporting Vessel-Based Dolphin Encounters around Kaua'i in 2017 (n=23)

Total Number of Vessels	**Vessel Capacity Range** (persons)	**Average Capacity**	**Median Capacity**
42	6-49	22	16

Businesses operating rigid inflatables from Kīkī a Ola harbor and Hanalei Bay offer one or two departures (morning or afternoon). Afternoon departures reportedly involve relatively fewer dolphin encounters. Tours operating large catamarans from Port Allen typically offer a single morning departure for dolphin encounters but also operate afternoon snorkeling and evening sunset/dining cruises. Two companies operate tours that transit the Nā Pali coast and Lehua Crater off Ni'ihau. Large swells from the west and northwest limit activity during the winter months, November through March. As such, some companies offer south shore tours during winter, while those operating from Hanalei typically close for the season.

Points of departure and size of vessel influence the nature of the Nā Pali coast tours. Weather and swell permitting, small vessels will travel close to the cliffs and occasionally enter the larger sea caves. In the absence of large swells or strong currents, patrons may be permitted to snorkel at Nu’alolo Kai, a protected reef area. Larger vessels traverse the coast farther out and moor at Makana Point, typically for snorkeling and dining. Guides provide narrative description of local geology, the history of Hawaiian fishing villages, facts about movies filmed on the coast, and aspects of the challenging Kalalau hiking trail.

Tour operators report that dolphin encounters, although short, are typically an important draw for passengers and an important highlight of the overall tour. The possibility of enhanced social media reviews and gratuities inspire knowledgeable captains to find dolphins and enable a satisfying vessel-based dolphin viewing experience for the passengers.

Nine of 13 operators offering Nā Pali Coast tours reported that the normal procedure was to slow the vessel upon seeing dolphins, and navigate parallel to the pod, gradually joining or allowing the pod to swim along or behind the vessel. Captains will sometimes put the engine in neutral and float with the dolphins. The encounter will either occur directly in line with navigational course or involve a slight divergence to adjust for the behavior of the dolphins. Many interactions occur within 50 yards.

Given the length of the Nā Pali coastline, captains must keep a tight schedule to undertake all planned activities. As such, dolphin encounters typically last between 10 and 15 minutes.

Captains occasionally ask passengers to help spot dolphins, and typically communicate the location of pods to other captains in their firm’s fleet.

Calm Morning at a Popular Snorkeling Site near Nu'alolo Kai, Nā Pali Coastline

Economic Aspects of Relevant Businesses on Kaua'i

Table 5.3 below provides trip cost figures for tour operations that advertise vessel-based dolphin encounters around Kaua'i. Fees for boat tours on the island vary primarily in relation to destination of the tour and size of vessel. Tours conducted along the south coast, which also advertise the possibility of seeing dolphins, are considerably cheaper than those centered on the Nā Pali coastline. Most trips to the Nā Pali coast involve extensive travel time. Fees therefore incorporate additional fuel costs for the lengthy trip.

Table 5-3 Operational Characteristics of Commercial Tour Boats Advertising Vessel-Based Dolphin Encounters: Kaua'i Island, 2016-2017 (n=21)

Average Trip Fee	Median Trip Fees	Trip Fee Range
$151	$149	$99-199

Gross Revenue. Table 5-4 below provides basic revenue figures for a sub-sample of boat tours that were providing vessel-based dolphin encounters around Kaua'i during 2017.

Table 5-4 Gross Revenues Reported by Commercial Boat Tour Owners/Operators Providing Vessel-Based Dolphin Encounters around Kaua'i, 2016-2017 (n=5)

Total Gross Revenue	Average Gross Revenue	Gross Revenue Range
22,165,804	$4,433,161	$612,000-11,999,804

Employees and Wages. Table 5-5 below depicts employee and wage figures derived from a small subset of tours that enabled vessel-based dolphin encounters around Kaua'i in 2017.

Table 5-5 Employees and Hourly Wages among Boat Tours Providing Vessel-Based Dolphin Encounters around Kaua'i, 2016-2017 in 2017 (n=5)

Total Employees in Sample	Mean Number Employees	Hourly Wage Range Captains*	Hourly Wage Range Crew*
162	18	$20 - 35	$10-18

*Not including tips

Patronage. Table 5-6 below depicts patronage information for tours providing vessel-based dolphin encounters around the island of Kaua'i during 2017.

Table 5-6 Patronage of Tour Operations Providing Vessel-based Dolphin Encounters around Kaua'i, 2016-2017 (n=5)

Approx. Total Passengers	Average Annual Passengers	Annual Passenger Range
158,215	31,643	3,672-86,567

Respondent Perspectives on Regulatory Impacts

The following table and descriptive section briefly summarize the perspectives of Kaua'i-based boat tour owners and operators on the potential effects of regulations intended to protect spinner dolphin populations around the MHI.

Table 5.7 Reported-as-Likely Impacts of a 50 Yard Buffer: Kaua'i Tour Boat Owners and Operators, 2017 (n=21)

Reported-as-Likely Effects	Frequency
No effect, operation currently in accordance with proposed spatial buffer	4
Dolphins would be a hindrance to navigation	4
Loss of marketing ability	6
Fifty yard buffer will not provide satisfactory guest experience	5
Fear of citation	2

Although Kaua'i-based tours do not provide underwater dolphin encounters, various tour owners and operators offer the perspective that a 50 yard buffer would affect their business operations. The primary reason given is that this distance would diminish their ability to provide a satisfactory viewing experience to patrons. It should be noted that dolphins reportedly are an important element of the typical marketing strategy, one that can provide a competitive edge over other ocean- and/or land-based tour options. As one respondent reported, “If that selling

point [close-proximity dolphin viewing] is taken away, there's plenty of other competition – ziplines, helicopters, ATV, kayaking, tubing, [and so forth]."

Two Kaua'i-based owner-operators reported fears that they could receive citations for coming too close to the cetaceans without intending to do so. This was further amplified by concerns that prospective patrons could hear about such citations through various social media and consequently engage other tours. One business owner asserted that the wording of the regulation is problematic since enforcement agents would be required to determine the intent of the captain and the desired course he was taking without being able to truly know whether the up-close encounter in question was accidental or intentional. For two long-time owner-operators, concerns about potential enforcement challenges stemmed from previous experience with regulatory changes and problematic interpretation of rules on the water.

Four research participants asserted that the proposed buffer could lead to navigational challenges. This relates to their reported fears that if captains are forced to avoid the cetaceans on short notice, other vessels in the area will also be forced to quickly react, with greater potential for collision. The captains also offered the perspective that heightened protection of dolphins in the nearshore zone would force them to transit in less protected waters farther offshore.

One respondent expressed the perspective that a spatial buffer could lead to conflicts within the fleet in that certain highly competitive captains may report violations and be found out by those receiving the citations. Another argued that the regulation may encourage certain tourists to seek a dolphin experience with the assistance of unlicensed captains and guides. Six respondents expressed doubts regarding the need for the regulation given what they argue is a healthy dolphin population along the Nā Pali coast.

Nā Pali

Summary Conclusions

Overview. Previous sections of this report describe short-term field research undertaken to support analysis of the potential economic effects of regulating human interactions with wild spinner dolphins in the MHI. A variety of pertinent economic and operational data requested by NOAA were collected, compiled, and presented in summary form for this purpose. The intent was not detailed analysis of potential economic impacts, but rather production of specific information of value to PIRO as the agency addresses various aspects of the EIS and rulemaking processes.

Ocean-based tour businesses in Hawai'i typically offer a variety of viewing and recreational experiences to their clients. This is certainly true of large tour vessels, the owners/operators of which typically provide sightseeing, snorkeling, diving, dining, and various other experiences, primarily to patrons visiting from other parts of the U.S. and abroad. Owners and operators of smaller vessels also typically facilitate a range of activities. Indeed, most commercial boat tours in Hawai'i provide numerous options to their clients. Such operational diversity increases the overall appeal to patrons and provides some insurance against economic loss should one or more activities be constrained in some fashion – by day-to-day or long-term environmental changes, government regulations, or increasing levels of competition within or across fleets or sectors, for example.

The benefits of operational diversity notwithstanding, certain businesses primarily offer highly specific experiences to their clientele. Operations that facilitate scuba-diving represent one such specialized kind of ocean-oriented business active in the MHI. A high degree of specialization certainly also characterizes ocean tours that offer close-proximity spiritual experiences with dolphins, and commercial boat tours that provide an eco-tourism type experience with dolphins at close quarters in the water column. In both of these cases, tour operators do provide some additional amenities and activities to their clientele as needed, but these are subsidiary to the high-priority underwater dolphin experience. A third type of dolphin operation facilitates encounters from vessels at a distance, with such encounters constituting one of a larger array of activities offered to clients.

This project documents clear operational differences and regulatory implications between tours that facilitate interactions between people and dolphins in the water column (underwater tours) and those that offer vessel-based encounters only. The former must and do universally occur in close proximity to the dolphins since a reasonably satisfying viewing experience in the MHI cannot occur underwater beyond around 100 feet, with much shorter distances reportedly and observably providing ideal viewing experiences. A high degree of specialization on the part of both spiritual tours and commercial boat tours that focus on underwater dolphin encounters, along with an inherent operational requirement for up-close interaction, puts each of these operations at special risk from the proposed spatial buffer. This is not to say that vessel-based tours may not be affected by a buffer, but rather that: (a) human vision is such that dolphins can be viewed from beyond 50 yards, with varying levels of satisfaction on the part of clients;[32] (b) some such tours have already been operating from such distances; (c) it is difficult for both owners/operators and analysts to confidently parse the relative value of the dolphin encounter, or

[32] As noted in the FEIS (U.S. Department of Commerce 2016:44), the prospective 50 yard buffer is intended to "accommodate a reasonable level of spinner dolphin viewing while minimizing potential detrimental impacts from close human interactions."

advertisement of the encounter, from other parts of the operation, such as generalized sightseeing or various recreational activities, for instance.

Variable Environs and Operations. Tour operators who facilitate underwater encounters with dolphins tend to be more clearly focused on finding and enabling close interactions with the cetaceans than those operating vessel-based tours. It is typically the case that much of an underwater tour is devoted to locating the creatures and enabling the interactive dolphin experience in specific resting bays. In contrast, the more diversified tours often encounter dolphins that are in transit and provide encounters of a different visual nature, conducted as they are from above the water column.

Notably, many tour operators of all sorts report a "gray area" between truly random dolphin encounters and encounters that result because captains know that dolphins are likely to be present in a specific location, during a certain time, or under specific environmental conditions. A social element of camaraderie can be involved in locating dolphins, as observed in certain island areas and industry sectors. That is, captains in both the underwater and vessel-based sectors will readily discuss the location of dolphins with others in their respective fleets, occasionally without regard to whether the recipient of the information is working for a competing business.

Island-specific environmental conditions can influence the nature of tour operations. For instance, the highly varied marine ecosystem around Maui has led to the development of a highly diversified tour fleet. In a setting of extensive coral reefs, sandy bays, lava formations, migrating whales, spinner dolphins, and close-proximity to Molokini and Lāna'i, Maui operators are able and prepared to offer a variety of eco-tourism experiences to visiting tourists. Here, the centrality of dolphins to the tourism experience is often superseded by other objects and activities of interest. Nevertheless, a fleet of small capacity vessels operating from Lahaina and Mala wharf regularly travel to Lāna'i specifically to facilitate vessel-based dolphin encounters.

Owners and operators of such tours assert that the proposed spatial buffer may constrain their profitability as "dolphin chasers," and require renewed emphasis of other marketing strategies and tour experiences to remain viable in a competitive market. Given extent diversity in operations among this group, and challenges inherent in assessing the value of advertising dolphin encounters, it will be difficult for PIRO to clearly assess economic effects potentially resulting from establishment of a spatial buffer among this fleet.

The natural environs of Kaua'i have also played a pivotal role in the development of the region's tour boat fleet. Indeed, the vertical green cliffs, azure ocean, and cultural resources of the Nā Pali coastline are accessible only by boat, and many thousands of tourists come to the island each year primarily to visit this scenic area. Notably, Nā Pali is also frequented by a particularly large pod of spinner dolphins, and thus a variety of tour operators combine the allure of the pali and the dolphins to successfully market and implement vessel-based tours. This has resulted in a fleet that presently operates in a relatively small nearshore zone populated by many cetaceans.

In the absence of facilitated underwater encounters, the principal challenge posed by the proposed buffer for Kaua'i operators is that it may lead to concentration of vessels in areas where dolphins are not directly adjacent. This may help ensure the well-being of the dolphins, but also limit the viability of the viewing experience for patrons while possibly introducing some new navigational challenges. Again, given the importance of the generalized sightseeing portion of the trips offered by this fleet, and the difficulties of assessing the value of dolphin advertising, accurate assessment of regulatory effects will be particularly challenging.

Tourists Attempting an Underwater Dolphin Photo

The sandy beaches and sheltered bays along the Leeward Coast of O'ahu are highly conducive to underwater dolphin encounters in the morning hours. Of note, a limited number of commercial use permits in conjunction with high demand on the part of tourists, has resulted in an O'ahu fleet that is at once small in terms of number of vessels, but large in terms of overall capacity.

Business is consistent in this ideal marine setting, and many thousands of island visitors experience close interaction with spinner dolphins each year during the relatively calm months of the Hawaiian summer. Some respondents here report that the considerable distance between the Leeward Coast and Waikiki, coupled with the availability of other tourist attractions "in Town" will challenge Leeward Coast operators seeking to adapt to the proposed spatial buffer. Others have begun to formulate and undertake new business plans in anticipation of new regulations.

The Kona Coast of Hawai'i Island is also ideal for facilitated dolphin interactions. Numerous sheltered bays and coves, extensive spinner dolphin populations, and a large and directly proximate tourist industry make this region highly attractive for persons seeking underwater dolphin encounters. The prevalence of small vessel operations along the Kona Coast is notable and relates in part to the fact that such vessels are well-suited for providing an intimate experience in and around the pods. Small vessels also allow for rapid loading and unloading of swimmers, and easy pursuit of moving pods. Whereas large vessel operations tend to be diversified and therefore potentially preadapted to regulatory change, some captains believe that small vessels may also bear some advantage inasmuch they could potentially enable rapid transit and mooring at other sites of interest. Whether tourists may be interested in such trips remains an important uncertainty since implementation of the proposed spatial buffer would likely make facilitation of close proximity dolphin interactions around the Big Island an historical activity.

O'ahu and Hawai'i Island Compared. Differences between the underwater encounters provided by tour operations on O'ahu and the Big Island are notable. The many dolphin-oriented spiritual retreats available on Hawaii Island represent a kind of boutique industry, wherein small groups of patrons experience dolphins in specifically tailored settings. Such operations are unique in the islands, and according to retreat owners and operations, patrons travel from around the world for this specific experience. Eco-tourism type dolphin experiences are similar in operational terms between O'ahu and Hawai'i, though as noted above, a small number of relatively large O'ahu vessels accommodate many passengers. In comparison, Hawai'i Island vessels affording underwater tours are smaller but greater in number. Tables 6.1 through 6.3 provide select comparative sample-based figures for O'ahu and Hawai'i Island-based spinner dolphin tour operations.

Table 6-1 Patronage of Boat Tours Providing Underwater Dolphin Encounters: Hawai'i Island and O'ahu, 2016-2017

Island Region	Approx. Total Passengers	Average Annual Passengers	Median Annual Passengers	Annual Passenger Range
Hawai'i Island (n=23)	40,066	1,742	1,200	168 - 5,300
O'ahu (n=6)	88,457	14,743	15,000	9,000 - 21,124

Table 6-2 Gross Revenues for Boat Tours Providing Underwater Dolphin Encounters: Hawai'i Island and O'ahu, 2016-2017

Island Region	Total Gross Revenue	Average Gross Revenue	Median Gross Revenue	Gross Revenue Range
Hawai'i Island (n=25)	$5,404,757	$245,670	$155,250	$16,800 - 789,357
O'ahu (n=6)	$11,511,809	$1,918,635	$1,935,000	$999,999 - 2,971,810

Table 6-3 Characteristics of Fleets Offering Dolphin Encounters by Island: 2016-2017

Vessel Characteristics	Total Number of Vessels	Vessel Capacity Range	Ave. Vessel Capacity	Median Vessel Capacity
Hawai'i Island (n=27)	38	5-35	11.4	10
O'ahu (n=6)	9	22-45	34	35
Maui (n=28)	58	6-149	37	49
Kaua'i (n=23)	42	6-49	22	16

Conclusion. The bulk of the data that inform this report were generated through primary source research with spiritual retreat leaders and tour boat owners and operators who facilitate encounters with dolphins as a business enterprise in various locations around the MHI. We believe the samples of business owners and operators to be sufficient for representing the operational tendencies and select economic attributes of these principal sectors. Given temporal limitations to implementation of fieldwork, and the unavailability of non-resident spiritual tour guides, we were unable to fully assess this sector despite that it is a rapidly growing part of the industry. Similarly, extensive in-depth interview work with patrons of all sorts was beyond the scope and time limitations of this study.

As noted elsewhere in this report, it is difficult to assess the frequency of incidental, opportunistic, or fortuitous dolphin encounters and the extent to which such encounters and

related advertising strategies contribute economic benefits to the firms in question. It is also difficult to assess the potential for success among owners/operators who may retreat from close-proximity underwater viewing to vessel-based viewing from beyond 50 yards and/or to heightened corollary emphasis on alternative sightseeing, recreation, or ecotourism options for their patrons. A clue in this regard is provided in Table 2-7 of this report, which tabulates the percentage distribution of total gross revenues that Hawai'i Island-based owners/operators attribute to the underwater dolphin encounter component of their business operations.

Moreover, while we do not attempt to generate multipliers for gauging the secondary economic impacts of operations and businesses that provide direct encounters, as this was beyond the scope of the current study, we do imbed in each chapter select information to aid in understanding categories of linkages between the spinner dolphin tour industry and other economic sectors.[33]

An important consideration for any analysis of marine resource use in Hawai'i is subjective valuation of the experience in question. In the case of guided dolphin encounters, the experience of seeing and being in the water with wild dolphins in a natural setting is reportedly and observably highly valued in subjective terms by many participants. But the actual value of that experience is not easily expressed in dollar terms, and additional work would be needed to do so with any validity. Similarly, numerous spiritual retreat leaders speak of the transformative and healing power of dolphin interactions, and some have configured their lifestyles and developed identities based on their capacity to effectively facilitate the interactions. Such factors and social processes also are not readily quantified.

This report has focused on description of relevant economic aspects of human-protected species interactions as recalled by owner-operators active in the MHI during 2017. The data are temporally unidimensional in this respect, and it should be kept in mind that dolphin tours are but a small, albeit integral, part of overall commercial tour boat patronage across the islands.

While the project was not intended to analytically relate the spinner dolphin industry to the larger MHI tourism economy, data regularly generated by the Hawaiian Tourism Authority suggest that the percentage of visitors participating in the Hawai'i tour boat industry in recent years has remained steady in a context of increasing visitation to the islands. Public officials interviewed during this project suggest that spinner dolphin tours are part of this trend, particularly on Hawai'i Island.

The capacity of tour businesses to adapt to the prospective regulatory change is likely to vary based in part on the nature of the tour in question. Business owners who offer in-ocean dolphin encounters as an eco-tourism activity and to persons attending spiritual retreats will unavoidably be impacted since a 50 yard buffer would preclude effective underwater viewing of the cetaceans. Various supporting business entities, such as swim guides, caterers, accommodation purveyors, and vessel maintenance and repair businesses logically would also be affected.

Scenario-based predictive assessment of regulatory impacts among these sectors was not specified in the SOW for this project.

Owners and operators of tours that presently offer in-ocean dolphin encounters discussed a variety of prospective adaptive strategies, including: (1) diversification of their businesses to include land tour options; (2) offering vessel-based dolphin encounters in lieu of in-ocean

[33] Aspects of the work undertaken by Utech (2000) and Wiener (2016) regarding economic valuation of whale-watching and dolphin encounters in the MHI may be useful to analysts seeking to assess economic impacts, including secondary economic linkages and impacts.

encounters; (3) offering reef snorkeling tours in lieu of dolphin encounters; (4) offering boat tours in other (scenic) locations; and (5) moving tour locations offshore to focus on other cetacean species. Factors such as vessel size, location of the operation, and vessel speed influence the ability of operators to undertake such strategies. Some strategies may induce effects on other marine resources. Due to lower average market ticket prices for remote vessel-based viewing of other marine/wildlife, it may be that owner-operators of vessel-based dolphin tours operating from beyond 50 yards will be forced to lower their prices. Again, this outcome remains speculative. Notably, strategies currently under consideration by regional agencies to regulate manta ray viewing could prevent Hawai'i Island-based dolphin tour operators from entering this sector in response to a newly regulated spinner dolphin tour industry. Economic effects may be heightened among industry participants who reside in communities with notably high rates of poverty, such as Wai'anae on O'ahu.

Certain operators who offer vessel-based dolphin encounters between Lahaina and Lāna'i, and along the Nā Pali coastline on Kaua'i, have expressed concern about potential regulatory effects. Such concerns relate to the perceived potential for diminished ability to provide a satisfactory viewing experience to patrons, and the possibility of receiving citations for unintentionally close encounters with dolphins. The research process revealed that many operators on Kaua'i and Maui are not fully aware of the nature of the proposed spatial regulations or cannot readily interpret them. More specifically, certain operators may need clarification regarding the proposed spatial regulation and how it compares with existing dolphin SMART guidelines.

Whether spinner dolphin operators can retreat from facilitation of close or otherwise potentially disruptive interactions with wild spinner dolphins and still provide a meaningful and economically viable viewing experience to patrons remains to be seen. Discussions with business owners and operators provide insight into current perspectives on this matter, but these perspectives and related strategies can and will change. Predictions about how businesses that presently facilitate underwater dolphin encounters and interactions will react to the proposed spatial buffer remain speculative in nature. Some owners and operators will adapt by offering a more remote viewing experience. Others will emphasize alternative sightseeing, recreational, or ecotourism options. Some will exit the industry. Only a thorough follow-up assessment can determine actual regulatory outcomes and contribute empirically-based lessons for policy-makers charged with addressing the delicate human-cetacean interface in the years to come.

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Appendix A: Interview Protocol (Example)

- Number and type of business owned and operated, years in business
- Number and types of vessel(s) used, capacities
- Trip fees by activity facilitated
- Areas where tours are conducted, variability
- Level of fleetwide use of key areas
- Nature of marketing
- Categorization of business as “small” or “large”
- Number of employees by position, wages paid, seasonal variation
- Gross revenue
- Gross revenue attributed to dolphin encounter portion of business
- Annual patronage, seasonal variability, long-term trends, residents/non-residents
- Nature of the operation in terms of experiences provided to patrons
- Nature of cetacean interactions afforded by the operation, spatial considerations
- Adjustments to establishment of spatial buffers
- Business-specific impacts potentially resulting from operational adjustments
- Categories of patron expenditures directly and indirectly related to services provided
- Perspectives on management

Appendix B: Trends in the Number of Active Tour Operations: 2007-2017

Type of Business	Hawai'i		Maui		O'ahu		Kaua'i	
	2007	2017	2007	2017	2007	2017	2007	2017
Spiritual Retreats Facilitating Close Proximity Underwater Encounters	5	47	1	0	0	0	1	0
Commercial Boat Tours Facilitating Close Proximity Underwater Encounters	6	47	0	0	8	7	0	0
Commercial Boat Tours Known to Opportunistically Provide Dolphin Viewing Experiences from Above the Water Column	9	*	~20	16	~28	*	~11	15
Universe of Commercial Tour Boats that May Encounter/Interaction with Spinner Dolphins During Routine Operations	100†	266††	117†	123††	196†	28††	59†	49††

*Enumeration of the generalized commercial boat tour fleet that opportunistically provides dolphin viewing experiences from above the water column was not a focus of the 2017 study as it was undertaken on Hawai'i Island or O'ahu; †Data from the Division of Boating and Ocean Recreation for 2003; †† Data from the Division of Boating and Ocean Recreation for 2016-2017 for West Hawai'i, West Maui, Leeward O'ahu, and Nā Pali region of Kaua'i only.

Appendix G – List of Agencies, Organizations, and Persons to Whom Copies of this Statement Were Sent

State and Federal Agencies

HI Department of Business, Economic Development, and Tourism
HI Department of Land and Natural Resources
HI Department of Land and Natural Resources, Division of Aquatic Resources
HI Department of Land and Natural Resources, Division of Aquatic Resources, Hawaiian Islands Humpback Whale National Marine Sanctuary
HI Department of Land and Natural Resources, Division of Boating and Ocean Recreation
HI Department of Land and Natural Resources, Office of Conservation and Coastal Lands
HI Department of Land and Natural Resources, Division of State Parks
U.S. Marine Mammal Commission
NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary
NOAA Office of National Marine Sanctuaries
NOAA Office of National Marine Sanctuaries Pacific Islands Region
HI Office of Environmental Quality Control
HI Office of Hawaiian Affairs
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency - PICO
U.S. Environmental Protection Agency Region IX (CED-2)
U.S. National Park Service Pu‘uhonua O Hōnaunau National Historical Park
United States Coast Guard
USFWS Hawaiian and Pacific Islands National Wildlife Refuge Complex
USFWS Pacific Islands Ecological Services Field Office
Western Pacific Fishery Management Council

Elected/Appointed Officials

City and County of Honolulu, Office of the Mayor	The Honorable Kirk Caldwell
County of Hawai‘i, Office of the Mayor	The Honorable William Kenoi
County of Kaua‘i, Office of the Mayor	The Honorable Bernard Carvalho
County of Maui, Office of the Mayor	The Honorable Alan Arakawa

NGOS & Advocacy Groups

Center for Biological Diversity	Hawai‘i Wildlife Fund
Conservation Council for Hawai‘i	Whale and Dolphin Conservation
EarthJustice	KAHEA
Earth Trust	Marine Conservation Institute
The Nature Conservancy	National Wildlife Federation
Dolphin Ecology Project	The Marine Mammal Center

Individuals

Gregory Wong	Dore Dokos-Loewenthal	Karen Adams-Thomas
SDK Naluai	DariSann and Michael Ball	Janet Brinkman
Walterbea Aldeguer	Vernon Keawe	Cindy Walsh
Richard A. Davison	Emily Burt	Rachail Baxter
Lara Kozloff	Fred Duerr	Sandiann K. Nago
Nicole Milne	Kit Kelly	Patricia McCarver
Kalei Tringali	Kimo Santos	Kamala Dockstader
Alexia Pihier	Michael and Melainah Yee	Michael Brown
Sam Pae	Margit Mayra Fuchs	Josephine Keliipio
Cynthia K.L. Rezentes	Susan Scott	John Smith
Jo Jordan	Joan Ocean	Mikahala Roy
Lucy Gay	David Shoup	Curt Colby
Carl Jellings	Alex Aquino	Elaine Valois and Les Gall
Lee Kehaulani Harper	Marie Burns	Debra Herring
William and Melva Aila	Kilinahe and Kaliko Grace	Randy Lawrence
Alan E. Nelson	Cynthia Hankins	Kimokeo Kapahulehua
Manuel M. Kuloloio	Elaine Blank	Rebecca Goff
Maureen Kleaver	David and Leinani Loa	Greg Howeth
Steve Burton	Rick Jones	Alastair Hebard
Jimmy Meideros	Iyvie Cooper	Caitlin Kielhorn
Michael Hyson	Lara Mukleburt	Alison Cohan
Kater Bourdon	Bernie Middleton	Joseph Fell-McDonald
Nancy Emery	Jeffrey Cooper	Jean Souza
Janna Shackeroff	Jack Womack	Kawika and Yolanda Cutcher
Linda Dohemann	Stephen Cornacchia	Dave Fletcher
Mark Chesler	Kalani Nakoa	Mimi Olry
Andrew Barfoot		Susan Chapman

Appendix H – Public Comments and Responses

RESPONSE TO PUBLIC COMMENTS

For the Draft Environmental Impact Statement for Enhancing Protections for Hawaiian Spinner Dolphins to Prevent Disturbance

Topic	Sect #	Comment	Response
Effects of the increasing number of human interactions with Hawaiian Spinner dolphins	1.2	COMMENT 1: Many commenters raised questions about the scientific information used to support the spinner dolphin protections in this rule. Scientific information on the impacts of close approach was called biased, inconclusive, incomplete, or wrong. Some commenters noted their personal observations were not consistent with the published studies, asserting that they have not seen spinner dolphins changing their behavior in response to vessels and swimmers, nor have they seen spinner dolphin populations decreasing. Additionally, some commenters suggest that scientific studies are not complete since most peer reviewed studies include shore-based or vessel-based observations as opposed to underwater observations.	We relied on the best available science to develop the proposed regulations to protect spinner dolphins in Hawai‘i. The majority of information used to develop the proposed rule and DEIS came from peer reviewed scientific publications (Norris *et al.* 1994; Lammers 2004; Danil *et al.* 2005; Courbis 2007; Courbis and Timmel 2009; Timmel *et al.* 2008; Forest 2001; Heenehan *et al*. 2017; Ostman-Lind *et al*. 2004; Ostman-Lind 2009; Thorne *et al*. 2012; and Wiener 2016). To a lesser extent, unpublished data, personal accounts, and other anecdotal information was used. We gave greater weight to empirical studies published in scientific journals than to personal observation and interpretation because such scientific studies use established scientific methods, test hypotheses, employ statistical analysis, and have been peer reviewed. These steps in the scientific process reduce the potential for bias in results. Reviewing best-available information from multiple independent scientists limits concerns about potential bias related to any one individual researcher, and provides a complete, robust set of information from which a decision can be made. Reported behavior changes observed in scientific studies may not be obvious to an observer who is not systematically observing the behavioral patterns that support spinner dolphins throughout the day. Many independent scientists studying varying areas, have reported changes in spinner dolphin behavior and reduced time spent engaging in resting behavior when in the presence of human activity (Courbis, 2007; Courbis and Timmel, 2009; Forest, 2001; Heenehan et al., 2014; Heenehan et al., 2017; Ostman-Lind et al., 2004; Ostman-Lind, 2009; Thorne et al., 2012; Tyne, 2013; Tyne, 2014; Tyne, 2015; Tyne, 2016; and Tyne, 2017; Weiner, 2016). These studies utilize multiple data collection techniques to observe dolphin behavior in the presence of human users and vessels, including shore-based observations, vessel-based observations, and in-water passive acoustic monitoring. Additionally, Weiner (2016) conducted in-water surveys of human and dolphin behaviors using Go-Pro cameras at 14 known spinner dolphin resting sites and found that, while interacting with dolphins, aggressive behaviors from humans (defined as active pursuit of interaction by chasing, diving, or deliberate approach) accounted for 27% of in-water human behavior. Combined, the above studies provide multiple lines of evidence regarding vessel and swimmer impacts on the behavior of spinner dolphins. Additionally, while underwater observations can yield insights into dolphin mating behaviors, they are not required to record evidence of disturbance, as disturbance can be seen in acoustic activity of

			dolphins, as well as behaviors visible from shore and from vessels. An overview of the scientific literature used in our decision making is available in the Final EIS, Section 1.4 "Scientific evidence of impacts of small cetaceans caused by human interactions." Regarding population abundance and declining trends, it is not possible to gain a thorough understanding of spinner dolphin abundance from observations in one or two bays. Factors such as habitat displacement, the movement of prey species in offshore waters, or season can account for increases or decreases in the number of spinner dolphins observed using a particular bay. Analysis of long term trends has not been conducted with the available data, as research conducted in the 1980s did not include year-round surveys and used different methods and a different survey area than more recent 2010-2011 surveys (SAR 2013). That said, other investigations have examined the relationship between cumulative vessel exposure and female dolphin reproductive success, such as Bejder (2005 and 2006a), which observed bottlenose dolphins and cautioned that dolphin tourism has potential for long-term consequences on female dolphin productivity, and that impacts may be amplified for small, closed or isolated, resident cetacean populations. While Bejder does not focus his studies on spinner dolphins, it is important to note here that Hawaiian spinner dolphins fit this description of small, closed, or isolated, resident cetacean populations. Further, the reguations are intended to prevent take of spinner dolphins and the impact of take on individual animals. These negative impacts occur regardless of the population trend and the MMPA prohibits take of individuals, regardless of whether the take results in population changes.
Proposed prohibited and exempted activities	2.4.1	COMMENT 2: One commenter stated he is against commercial swim-with-dolphin programs and proposed a 5-year moratorium on all commercial aspects of swimming with dolphins. Several commenters suggested that commercial swim-with-dolphin	First, we note that all of our alternatives, except the no action alternative, would prohibit swimming with dolphins. One reason for this is that, while commercial operations may occur at a larger scale and may appear to be more egregious, scientific studies have shown that any vessel or person approaching near dolphins can cause the dolphins to change their behavior (Forest 2001, Courbis and Timmel 2008, Ostman-Lind et al. 2004, Courbis 2004). Therefore the regulations were written

		operators need to be regulated/restricted but are not in favor of limiting non-motorized vessels or individuals' rights to swim with the dolphins. Commenters suggested that approach distance regulations should be applied to only commercial tour operators, rather than individual swimmers. One commenter noted that large boat loads of people cause most of the trouble for spinner dolphins. Additionally, one commenter suggested that the 50 yard approach distance only apply within designated essential daytime habitats.	to apply to any person or vessel that would approach a Hawaiian spinner dolphin within 50 yards. As noted in the proposed rule and the DEIS, Hawaiian spinner dolphin take (including harassment and disturbance) is not a problem that is specific to one ocean user group or one area of the Hawaiian Islands. Take of Hawaiian spinner dolphins occurs as a result of close approach by a variety of ocean users including commercial tour operators, non-commercial motorized and non-motorized vessels and swimmers in many areas of Hawai'i's nearshore waters (see Section 3.1.8 of the DEIS describing the Affected Environment and targeted areas across the MHI). While tour operations may be the primary cause of disturbance in some areas (e.g., Makako Bay), in other areas shore-based swimmers or recreational users are the primary concern (e.g. Kauhakō Bay). Therefore, we must apply any prohibitions designed to limit take to all user groups. Although specific essential daytime habitats are often targeted for close approach activities, spinner dolphins may travel between these areas and be found in many nearshore locations throughout the day. We are concerned that applying approach limits only within certain heavily-used areas, will displace human interactions with dolphins to other areas. In addition, in some areas, dolphins do not predominantly use discrete bays for their resting habitat as they do in other locations. , For example, the 10-fathom isobath off O'ahu's west coast was nicknamed the "spinner expressway" because dolphins are often found moving back and forth between sites throughout the day. Only protecting discrete areas would leave the dolphins vulnerable to take in areas outside of designated essential daytime habitats.
Proposed prohibited and exempted activities	2.4.1	COMMENT 3: Some commenters claimed harassment of spinner dolphins is not a problem because swimmers and tour operators police themselves.	Observations of human interactions with dolphins from the studies mentioned in response to Comment 1 show that Hawaiian spinner dolphins are demonstrating responses to disturbance by humans and that this disturbance is happening on a regular basis, especially in known resting areas. Further, the swim-with-dolphin tour industry has grown tremendously over the last decade (Weiner, 2016), thus exacerbating

			such disturbance. Individual and tour self-policing may help limit harassment, but it has not been sufficient to avoid negative effects to the dolphins and, given the potential for long-term impacts such as habitat displacement, adverse impacts to reproductive fitness, and population declines, there is a need for enhancing protections beyond self-policing.
Proposed prohibited and exempted activities	2.4.1	COMMENT 4: One commenter argued that the federal government does not have authority to regulate coastal waters. The commenter argues that this is a local issue, and should be governed by local government authorities.	NMFS does have the authority to publish and enforce these rules under Section 103 of the MMPA and its implementing regulations (16 U.S.C. 1373 §103 (a)). While the State of Hawai‘i has title and jurisdiction over submerged lands within 3 nm from shore, the navigable waters are under joint federal and state jurisdiction. Under the MMPA, the federal government has authority to protect marine mammals from take within all waters, ports, harbors, and lands under the jurisdiction of the United States. The MMPA defines “waters under the jurisdiction of the United States” to include the “the territorial sea of the United States,” as well as the waters included within the U.S. EEZ (which extends 200 nm from the shoreline). This regulation extends 2 nm from shore in addition to the connecting waters between Maui, Lāna‘i, and Kaho‘olawe, which is fully within both the territorial sea and the U.S. EEZ.
Proposed prohibited and exempted activities	2.4.1	COMMENT 5: Some commenters expressed concern that exceptions #1 and #2 in the proposed rule (which provide exceptions for people who inadvertently come within 50 yards of a dolphin or are approached by a dolphin, and for vessels that are underway and approached by a dolphin, provided the person or vessel makes no effort to engage the dolphin and continues normal navigation) will “hollow-out” the rule and specifically make enforcement difficult as it will allow those approaching dolphins within 50 yards to claim that the	In developing this rule, NMFS understood that spinner dolphins, as fast-moving marine mammals, may approach swimmers and boaters who, through no fault of their own, are placed in apparent violation of the 50-yard approach regulation. NMFS intends this rule to deter humans from approaching and disturbing spinner dolphins; it is not intended to punish individuals who come into inadvertent contact with spinners and then take all necessary and appropriate action to withdraw. While we appreciate that some individuals might abuse this defense, we believe that the NOAA enforcement proceeding is the appropriate forum for resolving these questions on a case by case basis. With regard to the “affirmative defense” portion of the proposed rule found in section 216.20 (d), NMFS has identified certain affirmative defenses to liability so that persons and vessels who come into inadvertent contact with spinners will not be subject to sanction.

		animal approached them. Additionally, commenters asked how NMFS will distinguish between an interaction that was inadvertent and one that was purposeful. One commenter suggested that subsection (d) of the proposed rule "affirmative defense" be eliminated in its entirety from the proposed rule because it places too much burden on a vessel operator and makes the exceptions difficult to be successfully invoked.	
Proposed prohibited and exempted activities	2.4.1	COMMENT 6: We received comments requesting specific exemptions from this proposed rule for fishing vessels. In particular, Hawai'i Fishermen's Alliance for Conservation and Tradition (HFACT) requested that NMFS consider the following exception, "Any fishing vessel that is anchored or adrift and is approached by a spinner dolphin, provided the vessel makes no effort to engage or pursue the animal." In addition, the Hawai'i Longline Association (HLA) noted that the longline fisheries do not threaten spinner dolphins with "chronic disturbance" and that, to the extent that the fisheries could interact with spinner dolphins, these interactions are already regulated under the MMPA. To minimize confusion for these	NMFS added an exception that specifically addresses commercial fishing vessels: Commercial fishing vessels that incidentally take spinner dolphins during the course of commercial fishing operations, provided such vessels operate in compliance with a valid marine mammal authorization in accordance with MMPA Section 118(c). Regarding HFACT's requested exception, a vessel that is adrift is, in accordance with COLREGS Rule 3, a vessel underway powered by the prevailing current, a scenario which is included in exception (2). However, HFACT has identified that a vessel at anchor may not be able to avoid coming within 50 yards of spinner dolphins if approached by these animals, and we agree that this scenario should be included in the exceptions to prohibitions. As a result, we have added an exception to the final rule, which exempts the following category from the regulation: "any vessel that is anchored or aground and is approached by a Hawaiian spinner dolphin, provided the vessel makes no effort to engage or pursue the animal" (50 CFR §216.20 (c)). We believe that the addition of this exception will not affect the overall purpose of this rule and will provide allowances for vessels that are not engaged in dolphin-directed activities, but find themselves within 50 yards of approaching animals.

		commercial fishing vessel operators, HLA requested an exemption for "vessels that are duly licensed to fish in the Hawai'i-based commercial longline fisheries."	
Proposed prohibited and exempted activities	2.4.1	COMMENT 7: Several commenters suggested that as part of this regulation, NOAA should require all vessels to participate in the Dolphin SMART program and should include Dolphin SMART guidelines in the regulation. One particular commenter stated that the tour company they operate follows Dolphin SMART guidelines and has successfully maintained a stable business.	This regulation adopts a 50 yard approach buffer around spinner dolphins, which is the same approach distance recommended by the Dolphin SMART program and our Responsible Marine Wildlife Viewing guidelines (publicly available at https://www.pifsc.noaa.gov/outreach/). Additionally, refraining from feeding spinner dolphins, which is also recommended by the Dolphin SMART program, is already prohibited under the MMPA (50 CFR 216). While we appreciate the commenters' support of the Dolphin SMART program, this program is a voluntary recognition and education program designed specifically for tour operators and is therefore, not appropriate for all vessels, including vessels such as fishing vessels and personal recreational vessels. Other Dolphin SMART guidelines associated with the program may not be applicable to private vessels, such as the guidelines for vessels to engage in responsible advertising and to provide outreach materials on responsible viewing to customers. Therefore, NMFS supports maintaining the Dolphin SMART program as part of a comprehensive outreach and engagement effort, rather than making all of the guidelines part of this regulation.
Whether 50 yards is the most appropriate distance for swim-with and approach restrictions to reduce take of spinner dolphins	2.4.1	COMMENT 8: Several commenters expressed concern that the proposed rule will be difficult to enforce and will be easily arguable since the burden will be on enforcement officials to show that a human user was within 50 yards and that a violation occurred. Commenters also noted that it can be difficult to judge distance, making it difficult for people	Because the rule has an objective approach distance, we believe that this rule can be effectively enforced. This approach prohibition clarifies protections in the MMPA by establishing a clear, objective distance requirement, thus facilitating enforcement activities while preventing take of spinner dolphins. Members of the public can envision the 50 yard distance as approximately the length of half a football field or the length of three large tour buses parked end-to-end. Enforcement officials are trained at judging the distances and have experience through enforcement of other approach regulations, such as the 100 yard approach rule for humpback whales in Hawai'i (81 FR 62010). In

		in the water and for enforcement officials to determine if people in the water are within 50 yards.	addition to visual observations, enforcement officials will use other evidence, such as photographic evidence, video evidence, and/or eye-witness accounts, when determining if a violation of the rule occurred
Whether 100 yards (91.4 m) or another distance is the most appropriate distance for swim-with and approach restrictions to reduce take of spinner dolphins	2.4.2	COMMENT 9: We received comments in favor of decreasing or increasing the proposed approach distance to lessen the impact on the viewing industry and to increase protections for Hawaiian spinner dolphins, respectively. Specifically, three commenters suggested that a 50 yard approach distance is too strict, and would not allow for any dolphin viewing activities to take place at that distance. One commenter suggested a 25 yard approach distance be used instead, and others suggested 20 yards or even 10 yards. Over 17,900 commenters suggested that a 100 yard approach distance is more appropriate than 50 yards. These commenters, many submitting comments through a form letter, argued that a 100 yard approach distance would be easier to comply with because it is consistent with the humpback whale approach rule in Hawaiian waters (81 FR 62018). Commenters argued that this consistency would lead to greater compliance and easier enforcement. Additionally, commenters argued that a 100 yard buffer zone would provide spinner dolphins in Hawai‘i increased	As stated in the rationale of the proposed rule and in the DEIS, we selected the 50 yard approach regulation because this distance will reduce the threat of take occurring (including harassment and disturbance) to Hawaiian spinner dolphins from close approaches by vessels and swimmers, while placing the least restrictive burden on human activities, such as meaningful dolphin watching opportunities. The 50 yard viewing distance has been recommended in NOAA's Watchable Wildlife Viewing guidelines for many years, and is also used by the Dolphin SMART program. We disagree that this distance is overly restrictive as many tour operators in Hawai‘i and elsewhere around the country have been certified in the Dolphin SMART program and have been able to run successful dolphin watching operations while complying with the 50 yard approach distance. We evaluated the effects of a 50 yard and 100 yard approach distance and discussed scientific literature regarding other distances. As indicated in the proposed rule (81 FR 57856) and the DEIS, scientific literature indicates that changes in spinner dolphin behavior are detectable when vessels or swimmers are found at distances ranging out as far as 500 m (Ross 2001, Forest 2001, Danil et al. 2005, Courbis and Timmel 2008, Timmel et al. 2008, Symons 2013, Johnston et al. 2014) and that effects generally increased as distance from the dolphins decreased (Ross 2001). We also recognized that there are scientific studies indicating that swimmer presence within 150 m (164 yds) reduces the likelihood of spinner dolphins being in a resting state, although vessel presence within this distance did not appear to cause disturbance. This research illustrates the complexity of the issue and why selecting one distance that will provide protection from disturbance can be difficult. However, we also recognized that not all approaches within 100 or 150 yards are likely to result in take of spinner dolphins, and that swimmers may have difficulty judging and achieving greater

		protection from exposure to human disturbance. Over 2,600 commenters suggested that 150 yards is a more appropriate buffer distance because it conforms to scientific evidence that dolphins can detect a disturbance within 150 yards. Several commenters suggested different approach distances based on the type of human user or the location. Finally, one commenter claimed that dolphin tour boats on the Waiʻanae coast of Oʻahu are chumming the waters to attract dolphins, honu, and fishes, which also attracts sharks. They therefore felt that 50 yards is not enough and that a radius of 1 mile is required so as to protect humans from what they perceived as an increased frequency in shark attacks.	distances around these animals because they are fast moving and relatively small (81 FR 57862). In comparison to viewing distances for larger whales, the 100 yard distance, or greater, was expected to decrease viewers' ability to actually see spinner dolphins without using visual aids such as binoculars. Although consistency with the humpback approach regulation (which prohibits getting within 100-yards of humpback whales) may be easier to remember and thus simplify compliance, our selection of 50 yards was guided by the most appropriate distance to prevent take of spinner dolphins from occurring, while placing the least restrictive burden on the viewing public Finally, NMFS regulations do prohibit the feeding of wild dolphins (50 CFR 216.3), so any chumming that may be taking place should be dealt with by reporting the activity to NMFS Office of Law Enforcement. These regulations prohibiting feeding, while not specifically designed to prevent shark attacks on humans, should serve as a deterrent for any person considering chumming to attract dolphins.
Research recommendations and priorities for better understanding how human disturbance affects Hawaiian spinner dolphins	1.4.1	**Comment 10:** Several commenters suggested that we should instead take different actions, such as working directly with experts in dolphin communication, or instituting a 2-year moratorium, or monitoring the change in spinner dolphin behavior/population health.	We agree that additional research is necessary to better understand spinner dolphin ecology. However, we believe that research is a necessary complement to, and not a substitute for, regulatory measures to reduce the impact of take on spinner dolphins. While we appreciate that there may be other actions that could be taken to address take of spinner dolphins in their resting habitat, we note that voluntary measures have been tried in the past and, while helpful, they have not been sufficient. Additionally, the purpose and nees of the proposed action were used to determine the range of alternatives.
Research recommendations and priorities for better	1.4.1	**Comment 11:** Several commenters suggested that monitoring the effectiveness of the regulations would be an important step to assess	We agree that monitoring the effectiveness of the final rule would be an important step to assess compliance with the rule. We are considering various means of monitoring to help us determine the extent to which this rule is effective in protecting Hawaiian spinner dolphins. Citizen

understanding how human disturbance affects Hawaiian spinner dolphins		compliance with the rule. One commenter suggested that we conduct a review of the proposed rule's effectiveness after 2 years, requesting feedback from local stakeholders. Other commenters requested that we utilize "citizen scientists" as part of spinner dolphin monitoring.	science in the form of volunteer data collectors may be one aspect of a multi-pronged approach to gathering the data necessary to determine such an impact. This multi-pronged approach could include data collection by volunteer observers, by spinner dolphin researchers (through passive acoustic monitoring equipment), and by NOAA OLE and State of Hawai'i's Department of Conservation and Resource Enforcement, or DOCARE, enforcement officials. In short, we recognize the need for monitoring and are working to implement it. If anyone is interested in staying up-to-date regarding our work to protect and monitor spinner dolphins, they can e-mail SpinnerDolphinProtections@noaa.gov to receive occasional updates directly from us.
Research recommendations and priorities for better understanding how human disturbance affects Hawaiian spinner dolphins	1.4.1	**Comment 12**: One commenter states that we did not consider a study that shows there are no harmful effects when dolphins remain vigilant for extended periods of time. The research article cited is Branstetter et al., (2012), and entitled, "Dolphins Can Maintain Vigilant Behavior through Echolocation for 15 Days without Interruption or Cognitive Impairment."	The research to which the commenter refers was conducted on captive bottlenose dolphins and looked at the impacts to their cognitive abilities, in the form of their ability to detect objects via echolocation, after 5 days and 15 days of constant engagement by researchers. The researchers found that there was no detectable loss of the dolphins' cognitive ability after maintaining a vigilant state for these extended time periods. Their results seemed to demonstrate that bottlenose dolphins can continuously monitor their environment and maintain long-term vigilant behavior through echolocation. The commenters believe that this research provides evidence that Hawaiian spinner dolphins do not suffer harm from disturbance by human interactions due to their ability to sleep with one half of their brain while the other half remains vigilant. However, there are several points that we would argue against this assertion. First, captive bottlenose dolphins have already been habituated to human disturbance by their very state of captivity, and may have even been subjected to other research projects over the course of their captive lives. Captive bottlenose dolphins cannot, therefore, be readily compared to wild dolphins. Second, bottlenose dolphins are a much more robust animal than are spinner dolphins, and they have a much more fluid life history strategy. They are adaptable to being held in captivity, whereas spinner dolphins have never been

			successfully held in captivity. Bottlenose dolphins are larger than spinner dolphins, both in size and weight, and forage opportunistically throughout the day on a large variety of prey species. Spinner dolphins forage only on the mesopelagic species that are hunted at night, and are only able to rest and nurture their young during the day, making them more susceptible to the impacts of human disturbance on their essential daily behaviors. Finally, this study looked only at cognitive impacts to the dolphins, and did not consider physical impacts to their well-being and fitness from maintaining a constant state of vigilance.
Research recommendations and priorities for better understanding how human disturbance affects Hawaiian spinner dolphins	1.4.1	**Comment 13:** Many commenters suggested that NMFS should focus rulemaking efforts on other factors that they perceive as having a greater impact on the health of Hawaiian spinner dolphins than close approach from humans. These commenters identified overfishing of prey species, pollution (such as stormwater runoff, trash, and trace chemicals from sunken, decommissioned military ships), captive dolphin swim-with programs and hotel exhibits (an activity they suggested that NOAA should ban), and acoustic impacts from military operations (such as Exercise Rim of the Pacific (RIMPAC) and military use of sonar equipment). Further, one commenter suggested that new regulations should not be implemented until NMFS understands how each of the above-mentioned factors impacts spinner population health.	Commenters are correct in noting that many factors can negatively affect the health of Hawaiian spinner dolphins. There are a variety of external factors or actions that have affected, may be affecting, or may have future impacts on Hawaiian spinner dolphins. As noted, many of these external factors are beyond the scope of this rulemaking, which is addressing close approach by humans as a specific threat to spinner dolphin health. Additional information about the effects of these external factors on Hawaiian spinner dolphin health is included in Section 4.5.1.1 of the Final Environmental Impact Statement (FEIS) ("Cumulative Effects of External Factors") and some are discussed below. Regarding commenter concerns about overfishing of spinner dolphin prey species, we work closely with the Western Pacific Fishery Management Council to reduce impacts of Federal fisheries to marine mammals through regulations and management actions, and work with the state and other fishery councils where our concerns overlap with nearshore fisheries. Regarding exposure to marine debris or trace chemicals from decommissioned ships, existing federal laws and regulations regulate or prohibit the discharge of oil, garbage, waste, plastics, and hazardous substances into ocean waters under a variety of laws, including the Clean Water Act; Oil Pollution Act of 1990; MARPOL 1973/1978; and the Marine Protection, Research and Sanctuaries Act. These laws have strict civil and criminal penalties for violations. Additionally, if trace

			chemicals were to occur in waters surrounding decommissioned military vessels, we would expect them to be quickly diluted or dispersed and not affect spinner dolphins. Regarding concerns about human interaction with dolphins in captivity, this rule only applies to wild Hawaiian spinner dolphins, not dolphins in captivity. NMFS issues permits for the removal of marine mammals from the wild, the import of marine mammals, the transfer of "releasable" rehabilitated marine mammals, and maintains the National Inventory of Marine Mammals, which tracks acquisitions, dispositions, and transfers/transports of marine mammals. However, the United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) has jurisdiction over animal care and maintenance for all marine mammals held for public display purposes under the Animal Welfare Act. This includes space, veterinary care, transport, and public interaction programs. Research recommendations and priorities for better understanding how human disturbance affects Hawaiian spinner dolphins Regarding the use of sonar in the marine environment and its impact on spinner dolphins, the extent to which sonar systems may affect marine life depends on the system in question, the environment in which it is operated, and the animals exposed to them. NMFS can permit certain limited activities, and has done so in the past for military activities. Such permits are provided after careful review of proposed activities and the geographies where they will take place to ensure the protection and viability of protected species stocks. Regardless of the other factors potentially affecting Hawaiian spinner dolphins, peer-reviewed scientific studies have shown that close approach by humans can result in negative impacts on Hawaiian spinner dolphin health, and multiple studies have shown an increase in the intensity of human interactions with dolphins in recent years. While we recognize that close approach by humans is not the only threat to dolphin health, this rule seeks to mitigate this real and increasing threat

			by reducing the impact of human viewing and interaction on resident stocks.
Research recommendations and priorities for better understanding how human disturbance affects Hawaiian spinner dolphins	1.4.1	**Comment 14:** One commenter stated that the information published in the DEIS does not comply with Office of Management and Budget (OMB) requirements under the Information Quality Act (a.k.a. Data Quality Act) by not adequately presenting a balance of best and worst case scenarios, a lack of bias and exhibited transparency, and by not adequately fulfilling the public notice requirements. Additionally, the commenter provided additional scientific articles that they believe need to be included in the rule's Environmental Impact analysis.	Under NOAA's Information Quality Guidelines, which fulfill OMB requirements under the Information Quality Act (IQA), the spinner dolphin proposed rule does not qualify as Influential Scientific Information (scientific information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions) or Highly Influential Scientific Assessment (influential scientific information that the agency or the Administrator of the Office of Information and Regulatory Affairs in the Office of Management and Budget determines to be a scientific assessment that: (i) could have a potential impact of more than $500 million in any year, or (ii) is novel, controversial, or precedent-setting or has significant interagency interest). As to the science supporting the rule, we relied on published reports and studies, most of which would have been peer reviewed prior to publication under independent processes, dependent upon the terms of the publication. We have reviewed the articles referenced by the commenter for their applicability to this proposed rule and address them here. The article cited as Christiansen and Lusseau (2015) describes studies that were done to determine if disturbance corresponded to changes in female reproductive success. The researchers developed a mechanistic model for minke whales (Balaenoptera acutorostrata) to measure the effects of behavioral disturbances caused by whalewatching activities on fetal growth. The model illustrates the pathway through which behaviorally mediated effects of anthropogenic disturbance might influence female reproductive success. They found that, although the behavioral disruptions caused by whalewatching interactions were substantial, the cumulative exposure of individuals to whalewatching boats was low, resulting in an effect on fetal growth no different from natural variability. For the minke whales studied in this research, the whalewatching took place at their feeding grounds and even the highest

			exposure to whalewatching vessels amounted to a total of only 427.5 minutes during the feeding season. The authors concluded that female minke whales would have to spend a large proportion of their day with whalewatching boats during each day of the feeding season, for them to start having a biologically important effect on fetal growth. This research is not directly applicable to the issue being addressed by the proposed rule, which is chronic exposure to human disturbance experienced by Hawaiian spinner dolphins. The cumulative exposure of spinner dolphins to human disturbance is occurring on a daily or near-daily basis throughout the year, and also occurs during times and at places that they would normally be resting and nurturing their young, not during feeding times. These essential daytime behaviors are needed to replenish and restore their energy and provide the nourishment needed for calves to reach maturity. The research cited as Hartel and Torres (2015) studied exclusion zones designed to protect bottlenose dolphin habitats. The research found that, over time, the bottlenose dolphins did not use the designated exclusion zones, and that they were therefore ineffective in providing habitat protection. While this research may seem to be applicable to the proposed alternative to implement time-area closures to protect Hawaiian spinner dolphins' essential daytime habitats, we note that there are significant differences in the behaviors and life history strategies of bottlenose and spinner dolphins. Spinner dolphins have a very rigid, predictable behavior pattern of hunting at night and resting and nurturing their young during the day. They return from their offshore feeding grounds to the same protected bays and shallow, sandy bottomed habitats and are found there with regularity. This is one of the main reasons why the swim-with-dolphin industry has been so successful, as the tour vessels are consistently able to locate the dolphins at the same sites on a daily basis. Researchers believe Hawaiian spinner dolphins choose these areas because of their proximity to their offshore feeding grounds and the protection they afford from predators, providing a safe place to rest. In contrast,

			bottlenose dolphins are much more fluid in their behaviors, feeding and resting throughout the day and foraging over much wider areas. They do not exhibit the same site fidelity to a particular area that spinner dolphins do. Indeed, this site fidelity is why time-area closures were considered as an alternative in the DEIS.The research cited as New et al. (2013) explored the response by bottlenose dolphins to a scenario in which vessel traffic increased from 70 to 470 vessels a year in response to the construction of a proposed offshore renewables' facility. Despite the more than six fold increase in vessel traffic, the dolphins' behavioral time budget, spatial distribution, motivations and social structure remained unchanged. They found that the dolphins are able to compensate for their immediate behavioral response to disturbances by commercial vessels. The research showed that if the increased commercial vessel traffic is the only escalation in anthropogenic activity, then the dolphins' response to disturbance is not biologically significant, because the dolphins' health is unaffected, leaving the vital rates and population dynamics unchanged. The authors note that behavioral change should not automatically be correlated with biological significance when assessing the conservation and management needs of species of interest. Again, this study centered on the responses of bottlenose dolphins to increased vessel traffic. For the same reasons stated above, the differences between bottlenose and spinner dolphins needs to be taken into consideration when looking at the results of this study. Bottlenose dolphins are much more resilient and fluid in their daily behavioral patterns. Spinner dolphins, by contrast, have very rigid and stable behavioral patterns of daily rest and socialization and nighttime foraging, and are therefore much more susceptible to disturbance of their essential daytime behaviors.
Research recommendations and priorities for better understanding	4.5.5	**Comment 15:** Two commenters expressed the need for NMFS to address climate change in the environmental analysis.	**Response:** We provided a complete analysis of climate change impacts associated with this rulemaking in Section 4.5.5 of the DEIS ("Impacts of Climate Change"). In this section, we detailed the cumulative effects that climate change may have on Hawaiian spinner dolphin health, including impacts on abundance and distribution of prey species,

how human disturbance affects Hawaiian spinner dolphins			impacts of sea level rise, and impacts associated with rising ocean temperatures (see section 4.5.5.1 of the DEIS). Additionally, we considered and evaluated impacts that the proposed alternatives could have on climate change (see section 4.5.5.2 of the DEIS).
Research recommendations and priorities for better understanding how human disturbance affects Hawaiian spinner dolphins	1.4.1	**Comment 16:** We received comments that questioned the credibility of some of the research used to support the proposed rule and the analyses of alternatives in the DEIS. Specifically, commenters noted that the SAPPHIRE Project received partial funding from Dolphin Quest, which profits from swim-with captive dolphin programs. Commenters suggested that this presents a conflict of interest as findings that support prohibitions for approaching wild dolphins could support Dolphin Quest's business.	To clarify, the research effort to which the commenters refer (which resulted in several publications by Tyne et. al.) received a portion (less than 25%) of their funding from Dolphin Quest. Tyne et al.'s work included spinner dolphin population abundance information off of West Hawai'i, pointed out the significance of the resting bays for spinner dolphin rest, and raised questions about the quality of rest that the Hawai'i spinner dolphin population achieves within these habitats. First, we note that our decisions associated with this rulemaking do not rest solely on the studies from the SAPPHIRE project. Rather we relied on the many scientific publications, including multiple in Hawai'i, that indicate that intense human pressure can have negative effects on local wild dolphin populations (Ostman-Lind *et al*. 2004; Courbis 2008; Timmel *et al.* 2008; Heenehan *et al*. 2017). A comprehensive list of journal articles and information sources are referenced in the Final EIS. Second, researchers in many fields rely on funding from various sources to conduct their work, including government grants, NGOs, and private sources, and we cannot assume that the acceptance of funds from specific entities would compromise the research being conducted. In our review of the studies associated with the SAPPHIRE project, we found no information to suggest that the credibility of these works were compromised. The academic papers in question were peer-reviewed, which is a process by which research is checked by a group of experts in the same field to ensure that the scholarly work meets necessary standards before it is published in an academic journal, such as those where Tyne's papers were published: Royal Society Open Science, Biological Conservation, and the Journal of Applied Ecology. The abundance information was reviewed closely by PIFSC researchers and currently provides the most rigorous estimate for our local spinner dolphin populations. Tyne et al.'s work indicating the significance of

			resting habitat in supporting spinner dolphin resting behavior confirmed findings presented by earlier works by Ken Norris in the 1990s. Additionally, Tyne et al.'s work questioning the quality of rest that this population receives echoes concerns expressed by other researchers, such as Courbis and Timmel (2009), Heenehan et al.(2015 and 2016), Forrest (2001), and Danil et al. (2005). As a result, we determined that these studies by Tyne et al. are well supported, including them in our analysis of the best available science.
Information on responsible viewing of marine mammals	1.3.3	**Comment 17:** Several commenters expressed concern that limiting interaction with spinner dolphins may displace the impacts of human interaction onto other wild marine mammals, or onto captive bottlenose dolphins. Additionally, commenters specifically suggested that to avoid this displaced impact, NOAA should expand the scope of this rule to protect all marine mammals in Hawai‘i, including dolphins in captivity.	All marine mammals are protected from take by the MMPA, defined as "to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal" (16 U.S.C. 1362). While this regulation regulation implements necessary and appropriate measures to prevent take in the form of harassment of spinner dolphins, other wild marine mammals are still protected from take (including harassment) under the MMPA. Spinner dolphins are unique, in that they are a charismatic species that spends time resting in areas close to shore, and therefore easily accessible to human users of the nearshore environment. Their predictable daytime behavior has made it possible for the swim-with-wild-dolphin industry to develop and be economically viable. With regard to other marine mammals in Hawaiian waters, we note that we have approach distance regulations for some other species of marine mammals, such as humpback whales in Hawai‘i (50 CFR 216.19). However, each rule is based on the ecology of the specific animal, as well as the best available scientific information on the nature of the threats. Regarding dolphins in captivity, the United States Department of Agriculture has jurisdiction over animal care and maintenance for all marine mammals held for public display purposes under the Animal Welfare Act. For additional information regarding captive dolphins, please see the response to comment 13.
Additional information on	1.4.1	**Comment 18:** Many commenters suggest that Hawaiian spinner dolphins choose to interact with	We recognize that dolphins are curious and may approach humans in the water. Indeed, there was an exception in the proposed rule, which remains in the final rule, that allows humans to be within 50-yards of a

spinner dolphin behaviors		human users and vessels. Additionally, commenters suggest that if dolphins did not want to interact with human users and vessels, the dolphins have the ability to swim away. As a result, some commenters assert that people can't swim with dolphins; rather, it is the dolphins who swim with people, because the dolphins could swim away at any time.	dolphin if the dolphin approaches them, provided that they do not purposefully place themselves in the path of oncoming dolphins, that they make no effort to engage or pursue the animal, and that they take immediate steps to move away from the animal. That said, there is ample evidence that humans often approach dolphins in their daytime resting areas, and this may have negative biological impacts on spinner dolphins. While dolphins can indeed swim faster than humans, the choice for dolphins to swim away from humans interrupts their rest, keeps them in a state of vigilance, and requires energetic expenditures that could be used for something else. Even within a resting area, swimming away to avoid humans who want to interact with them both interrupts rest and forces the dolphins to expend energy to increase their swimming speed and/or change direction. This increase in their energetic expenditures for purposes of avoidance could lead to decreased energy needed for other important behaviors, such as foraging and nurturing their young. Over the long term, this could affect the fitness of individual dolphins, and their ability to forage as a group. Further, their ability to swim away is limited by the fact that avoiding humans or leaving their preferred resting habitat altogether can lead to a greater risk of predation, and may involve greater energetic demands because they may need to travel farther distances to reach their feeding grounds. Finally, peer reviewed studies on the island of Hawai'i suggest that dolphins are unlikely to rest outside of resting bays (Tyne et al., 2015; Lammers 2004; Norris et al., 1994). If dolphins are displaced from their preferred resting habitat due to intense human presence in those bays, there is no guarantee that they will find habitat close to their night time feeding grounds that has fewer human users or less anthropogenic noise, and they may not be able to rest.
Additional information on spinner dolphin behaviors	1.4.1	**Comment 19:** Many commenters argued against the proposed rule, stating that NMFS fails to understand the consciousness of dolphins and that	There is a growing body of scientific evidence documenting the negative effects of dolphin-directed activities on spinner dolphins, especially activities that involve close approaches by humans, regardless of the intent of the humans, and there is no scientific

		NMFS perceives a problem with humans swimming with dolphins where none exists. Additionally, one commenter suggested that humans swimming with dolphins is important to both species, while another commenter argued that those who attend spiritual retreats to swim with dolphins attest that the experience is life-changing.	evidence to suggest that Hawaiian spinner dolphins receive a long-term health benefit from prolonged, close interactions with humans. Peer-reviewed scientific literature documents dolphin-directed human activity as causing disturbance to individual spinner dolphins, as well as changes to spinner dolphin group behavioral patterns. Individual dolphin responses to these activities vary and, in some cases, may not be apparent to an observer (e.g., elevated heart rates or increased watchfulness). However, discernible responses include aerial displays, tail-slapping, or other visible behavior changes when closely approached by vessels and swimmers (Forest 2001, Courbis and Timmel 2008); avoidance behaviors, including increased swimming speed, directional changes, moving around and away from swimmers and vessels, or leaving the area in response to human pursuit (Ostman-Lind et al. 2004, Courbis 2004, Courbis and Timmel 2008); and aggressive behaviors directed at people, including charging or threat displays (Norris et al. 1985, Norris et al. 1994). Effects have also been documented in the form of changes to spinner dolphins' behavior patterns in essential daytime habitats, including the amount of time spent within resting habitat, distribution within the habitat, and changes to patterns associated with aerial behaviors (Courbis 2004, 2007; Timmel et al. 2008; Östman-Lind 2007; Danil et al. 2005; Forest 2001). Swimming with Hawaiian spinner dolphins has become a popular activity in Hawai‘i, because Hawaiian spinner dolphins are charismatic animals, are easily accessible to humans while in their resting habitat, and may even approach humans swimming in coastal areas. However, as stated in our response to comment 13, spinner dolphins that interact with swimmers endure an energetic cost, and the time for restorative or fitness-enhancing behaviors — particularly rest — is lost due to these disruptions. People are often unaware that changes in dolphin behavior take away from daytime fitness-promoting behaviors with other dolphins.
Other human activities affected	3.5; 5.3.1	**Comment 20:** Many commenters expressed concern that this rule would	In response to concerns raised that the economic data used for the analysis in the DEIS is outdated, we have updated the economic

by the proposed rule that were not discussed		have a large impact on the local economy. Some commenters representing the tour industry specifically indicated that they anticipate this rule to have a large impact on their businesses. Additionally, 17 commenters argued that the data used in our economic impact analysis, presented as part of the DEIS, was insufficient, out-of-date, and needed to include additional data in order to analyze the potential economic impact of this rule's implementation. One commenter specifically suggested a need for more data on the tour industry on West O'ahu.	analysis and we considered the new data in our decision-making process for the final rule and in the Final EIS. There has been an approximately 6-fold increase in the number of tours and spiritual retreats offering swim-with-wild-dolphin experiences, as well as a corresponding increase in the gross revenues generated by these businesses, in the 10 year span between the original economic data report and the updated report, However, we are confident that most, if not all, dolphin-associated businesses will be able to continue operations in the dolphin viewing industry, as Dolphin Smart tour operators have been able to stay in business even with competition from "swim with dolphin" tours and, with a level playing field for all operators to offer similar experiences to their guests, we anticipate this will be even more likely. It is possible that there may be some loss of revenues due to differences in the amounts charged for a swim-with-dolphin experience versus a general marine tour/wildlife viewing experience, but we are unable to project how much loss may occur as a result of the regulations going into effect.
Other human activities affected by the proposed rule that were not discussed	4.4.3.1	**Comment 21:** One commenter indicated that they receive "life force" from dolphins and whales and that this regulation would violate the commenter's constitutional rights.	The purpose of this regulation is to prevent encounters that result in disturbance to and harassment of Hawaiian spinner dolphins. Although the regulation is not intended to interfere with anyone's spiritual beliefs or safe viewing practices, it is our duty to implement the conservation purposes of the MMPA, including necessary and appropriate regulations that protect spinner dolphins from take. As described in the preamble, human encounters with Hawaiian spinner dolphins may have long-term adverse effects that may not be immediately apparent to the observer. We considered evidence that human behavior can result in take at distances of 100 and 150 yards, as well as no swim with and approach regulations, and also considered such requirements as time area closures in certain bays. We do not believe that the status quo provides adequate safeguards for these marine mammals. One of the considerations in choosing a 50 yard approach rule, as opposed to 100 or 150 yards, was that it was the minimum appropriate distance to prevent disturbance to them, while still allowing people to view the

			dolphins. At this time, we believe that a 50 yard approach buffer provides the least restrictive means for accomplishing the important conservation purposes of the regulation, while accounting for the interests of the observing public, including the commenter.
Other human activities affected by the proposed rule that were not discussed	4.3.1	**Comment 22:** One commenter noted that spotted dolphins (*Stenella attenuata*) often interact with fishing vessels for long periods of time and have intensive feeding requirements similar to those of spinner dolphins, but the need for spotted dolphins to have uninterrupted sleep is not a concern to NMFS. Additionally, this commenter notes that Bottlenose dolphins have long been harassed by fishermen off the Kona coast for stealing live bait from marlin and tuna fishermen and market fish from bottom fishermen, yet NMFS has not established protections for Bottlenose dolphins.	As described in several comment responses above, as well as the "SUPPLEMENTARY INFORMATION" section of the Final Rule, wild marine mammal harassment is prohibited by the MMPA. This includes Level A harassment (any act of pursuit, torment, or annoyance which has the *potential to injure* a marine mammal), and Level B harassment (any act that has the *potential to disturb* a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering). As a result, harassment of any wild dolphin species, including spotted dolphins and bottlenose dolphins, is illegal under the MMPA. While NMFS is concerned about spotted and bottlenose dolphins, this rule focused on spinner dolphins because their unique habitat preferences and resting behaviors make them particularly vulnerable to disturbance. More detail about spinner dolphin vulnerability to disturbance is available in the response to comment 24, as well as in section 3.1.4 of the FEIS "Ecology and Behavior."
The temporal and geographic scope (i.e., 2 nm from shore) of the approach regulation	2.1.3	**Comment 23:** Multiple commenters suggested that we should implement a rule that extends 10 nm from shore to encompass the entire range of the main Hawaiian islands island-associated resident stocks. Some commenters suggested that people may seek encounters with the dolphins outside of the 2 nm, leaving the dolphins unprotected outside of this boundary.	As marine mammals, spinner dolphins continue to be protected by the MMPA throughout their range, including near coastal and ocean waters. Extending the effective area of the regulations out to 10 nm from shore was considered in the DEIS (see section 2.1.3 in the DEIS). As stated in the rationale for the rule and in the EISs these regulatory measures are intended to prevent take of Hawaiian spinner dolphins from occurring in marine areas where viewing pressures are most prevalent. We have no information to suggest that these stocks of Hawaiian spinner dolphins face any kind of regular exposure to wildlife viewing activities that cause take outside of 2nm from shore. Further, because the locations where spinner dolphins might be found beyond 2 nm is not predictable, as it is closer to shore, we do not anticipate that encounters with

			dolphins outside of 2 nm will become common after the rule is finalized. MMPA take prohibitions will continue to apply in the US EEZ and high seas where these regulations do not apply. To encompass the range of dolphin-directed activities that are likely to result in take, we focused on where people are most likely to encounter Hawaiian spinner dolphin groups, i.e., where dolphins are known to occur during the day when they are engaged in nearshore resting and socializing activities. We reviewed information from scientific literature about Hawaiian spinner dolphin daytime habitat preferences and information from over 400 sightings of spinner dolphins collected around the MHI since 1992 from various members of the Pacific Islands Photo Identification Network (PIPIN) to determine that the 2 nm boundary sufficiently covered the dolphins' daytime habitat use. Because almost all viewing and interaction pressures occur during the day within 2 nm from shore and in the designated waters between Lānaʻi, Maui, and Kahoʻolawe, expanding the scope to include the resident's stocks entire range would provide negligible additional protection from take by approach within 50 yards.
The temporal and geographic scope (i.e., 2 nm from shore) of the approach regulation	2.1.3	**Comment 24:** The State of Hawaiʻi DLNR commented that it supports the proposed rule but believes it should be expanded to apply to the entire U.S. economic exclusion zone (EEZ) within 200 nm from shore, to simplify compliance for users and streamline enforcement efforts.	As described above in our response to comment 23, we considered the geographic scope of the rulemaking in our EIS, including applying it to the entire EEZ, and determined that a 2nm boundary provided the protections from daytime disturbance needed for spinner dolphins. These proposed regulatory measures are intended to prevent take of Hawaiian spinner dolphins from occurring in areas where viewing pressures are most prevalent. We therefore felt it was unnecessary to extend the reach of the regulations to areas where take is less likely to occur. Enforcement efforts will be concentrated within the 2nm boundary rather than spread across a much larger area, thereby increasing the effectiveness of these efforts.
The temporal and geographic scope (i.e., 2 nm from shore) of the	2.1.3	**Comment 25**: A commenter suggested that the regulations should be applicable to all dolphin species and all U.S. citizens or nationals	The purpose of this rule is to address the increase in human pressures on spinner dolphins in coastal waters around the state of Hawaii. A no-approach regulation with national application is beyond the scope of this rule. Additionally, swim-with tours have not been identified as a

approach regulation		anywhere in the world (and also advocated for a 100 yard approach rule).	major threat for other dolphin species in the areas surrounding MHI at this time. While this rule does not apply to other dolphin species, other species may benefit as public ocean users become aware of the potential impacts of close approach and would keep their distance from all wildlife. We do not find, at this time, that the enhanced protections in this rule are necessary seaward of 2 nautical miles off the Hawaiian islands, or in other regions of the United States. The MMPA's general moratorium on the taking of marine mammals, which applies in waters under U.S. jurisdiction as well as to persons and vessels subject to U.S. jurisdiction on the high-seas, continues to protect dolphins that may be found outside the boundaries of this rule. With regard to the specific comment that the regulation should include a 100 yard approach rule, see our response to Comment 9.
The temporal and geographic scope (i.e., 2 nm from shore) of the approach regulation	2.1.3	**Comment 26:** Many commenters suggested that the geographic action area for the proposed rule should be limited to one or two islands, rather than all waters within 2 nm of each of the main Hawaiian islands and in the designated waters between the islands of Lāna'i, Maui, and Kaho'olawe. Specifically, commenters noted that the problem of spinner dolphin harassment from close approach by humans is greater on the islands of Hawai'i and O'ahu than it is on islands like Maui and Kaua'i. As such, the geographic action area for the proposed rule establishing protections for spinner dolphins should be limited to areas with the largest number of tour operators and human users.	The commenters are correct that islands like O'ahu and Hawai'i have a greater number of operating dolphin-directed tour companies, spiritual retreats and individuals swimming to the dolphins from shore due to factors such as easily accessible essential daytime habitats. However, Hawaiian spinner dolphins utilize sandy, protected bays and nearshore areas for resting and socializing across the Hawaiian Islands. While the largest number of human users are concentrated on one or two islands, close approach by humans occurs statewide (Sepez, 2006) (see section 1.6 of the FEIS, "Description and Scope of the Proposed Action"), and affects all of the island-associated spinner stocks. Limiting this rule to only one or two islands or to the geographic extent of an island-associated stock could result in displacement of dolphin-directed human activity to other areas of the state where Hawaiian spinner dolphins are present, thus undermining the protections established in this regulation. Regarding the concern by some commenters that spinner dolphin data informing this rule was only collected on Hawai'i Island, this rule was developed through a literature review of available data for Hawaiian spinner dolphins throughout the state. Many recent research efforts focused on bays on Hawai'i Island, as these bays are often used as

		Additionally, several commenters argued that, because many of the supporting studies cited by NOAA in the proposed rule and DEIS conducted their research along the Kona coast of the island of Hawai‘i, the geographic action area of the proposed rule should only include waters surrounding the island of Hawai‘i. These commenters argue that the DEIS gives too much weight to these studies, which cover a small geographic area (relative to the State as a whole), and therefore the rule does not adequately account for the behavioral or social differences between island-specific populations of spinner dolphins. One commenter suggested that the geographic action area of the proposed rule be limited to the range of one or more of the three island-associated stocks of spinner dolphins in the MHI. The commenter did not suggest a specific stock for protection.	daytime resting habitat for spinner dolphins and are a place where researchers can reliably study spinner dolphin behavior. These locations include Hōnaunau Bay, Kealakekua Bay, Makako Bay, and Kauhakō Bay, which were the sites for recent studies on the impacts of human interaction on dolphin population health, such as the SAPPHIRE studies (see SUPPLEMENTARY INFORMATION section of the final rule). While these studies focused on a limited geography, the findings regarding spinner dolphin behavior changes in the presence of human users are representative of wider scenarios where humans are in prolonged contact with resting Hawaiian spinner dolphins. Additionally, while the SAPPHIRE studies researched Hawaiian spinner dolphins on Hawai‘i Island, research has been conducted on O‘ahu, Maui, Lāna‘i, Kaho‘olawe, Molokai, and Kaua‘i, resulting in peer-reviewed journal articles that were consulted when developing this rule and FEIS as well (e.g., Norris and Dohl, 1980; Benoit-Bird and Au, 2003; Danil et al., 2005; Hill et al., 2005; Lammers et al., 2000, 2001, 2003, 2004, 2006; Mobley et al,. 2000, and Weiner 2016). In short, we consulted studies conducted across the state, and, because close approach of Hawaiian spinner dolphins by humans is occurring state-wide, we determined that the geographic extent of the rule should be state wide as well.
The temporal and geographic scope (i.e., 2 nm from shore) of the approach regulation	2.1.3	**Comment 27:** Multiple commenters submitted ideas for alternative management considerations with different combinations of geographic ranges, approach distances, and enforcement times. For example, one commenter, citing O‘ahu-based studies done by Lammers and Danil, suggests a 100 yard approach	We addressed aspects of this alternative suggestion in multiple comment responses. As stated in the response to comment 9, we determined that a 100-yard approach distance would decrease a dolphin viewer’s ability to see the animals without visual aids, such as binoculars. As a result, we determined that an approach distance of 50 yards would provide increased protection for the animals by preventing harassment, while still allowing people to observe spinner dolphins. Regarding an O‘ahu-specific regulation, we would like to direct the commenter to our response to comment 26, where we address

		regulation on Oʻahu from 11AM to 6PM. The commenter states that 100 yards is easier to judge and more enforceable than 50 yards. Additionally, the regulation should be Oʻahu-specific given habitat and behavioral differences between Oʻahu spinner dolphins and Hawaiʻi Island spinner dolphins, specifically that they often rest during the midday and early afternoon periods.	comments to limit the regulation to certain areas. In short, disturbance resulting from close approach can occur at any time of day, provided the dolphin is close to shore. With that in mind, limiting the rule to only one area, or limiting the rule to only certain time periods, could result in displacement of dolphin-directed human activity to other areas where dolphins are present or to other times of day, thus undermining the protections established in this regulation.
Whether time-area closures are necessary to address the intensity of Hawaiian spinner dolphin-directed activities in some areas	2.5	**Comment 28:** We received comments that were opposed to the implementation of time-areas closures, because they felt that closures were either unnecessary to achieve the desired protections because the proposed approach regulations would provide adequate protection, or overly restrictive to the public, restricting shore access rights or use of waters in Hawaiʻi. The State of Hawaiʻi DLNR did not support time-area closures because they feel that the 50-yard approach rule best addresses the threat posed by dolphin-directed activities across the extent of their range.	Although time-area closures provide members of the public with precise boundaries around which they may readily tailor their conduct, and they may be more easily enforceable as it would be simple to determine whether a person is within the designated closure area, we recognize that such closures can also carry undesired costs, such as imposing a burden on the public when spinner dolphins are not present. Based on consideration of public comments and revised input from the State of Hawaii, NMFS is reconsidering its prior position on time-area closures, which it will address in a forthcoming proposed rule.
Whether time-area closures are necessary to address the intensity of Hawaiian spinner	2.5	**Comment 29:** Researchers suggested looking at the time-area closures in Samadai Reef, Egypt as an example of what has been proven to be effective in protecting other dolphin species.	When determining whether to propose implementing time-area closures, we considered the Samadai Reef example, in which spinner dolphins that had abandoned the site returned to it after management measures were put in place to prevent human entry into the core resting area (see DEIS section 1.5.2). As noted in the response to comment 28, NMFS is

dolphin-directed activities in some areas			reconsidering its prior position on time-area closures, which it will address in a forthcoming proposed rule.
Whether time-area closures are necessary to address the intensity of Hawaiian spinner dolphin-directed activities in some areas	2.5	**Comment 30:** Several commenters said an approach rule is too difficult to enforce and time-area closures are a more appropriate alternative. The National Park Service also commented that, while they support the proposed rule, the data from Östman-Lind (2009) and other studies (Johnson et al. 2013) suggest that a larger buffer distance or a selection of mandatory time-area closures (with the exceptions mentioned in the DEIS) would be more beneficial to the Hawaiian spinner dolphin population, and would likely improve enforcement of the proposed rule.	Given our positive experience with enforcing the 100 yard humpback whale approach rule in Hawai‘i, we believe that this spinner dolphin approach rule can be successfully enforced. We also recognize that time-area closures provide members of the public with precise boundaries around which they may tailor their conduct and makes enforcement of such closures straightforward. We considered this comment and others that are supportive of time-area closures. We agree with these comments and believe that a combination of 50 yard no swim-with and approach regulations and mandatory time-area closures will provide the most effective overall protection for these dolphins.
The bays and times of day identified for time-area closures	2.7.2	**Comment 31:** One commenter suggested that the proposed boundaries of the time-area closures be changed to cover half of the bays so the dolphins could choose either to swim with humans or to rest.	As noted in the proposed rule and DEIS, the MMPA provides limited exceptions to the prohibitions on take (e.g., scientific research permits) and requires that people and organizations conduct wildlife viewing in a manner that does not cause take. Because close interactions with marine mammals are likely to result in take, including harassment and disturbance, we cannot support, condone, approve, or authorize attempting to swim with, pet, touch, or elicit a reaction from dolphins. In response to the commenter suggestion to change the boundaries to only cover half of the bays so that the dolphins could “choose” to swim with humans or rest, the proposed closure boundaries were already designed to cover only part of the bay while leaving other portions open.
The bays and times of day	2.7.2	**Comment 32:** Many commenters supported time-area closures, but	We considered the appropriate times for the closures, and found that the earlier studies noted the dolphins entering the bay approximately an

identified for time-area closures		suggested alternative closures times such as from 9:30AM to 4PM, from 10AM to 2PM, or from 11AM and 6PM to reduce the impacts to other ocean users. Some commenters claim that if time-area closures are chosen, the time should be expanded to when the dolphins leave, as the dolphins often stay in the bays past 3PM.	hour after sunrise and staying late into the afternoon (Norris et al. 1994). The period of 6AM to 3PM was chosen in order to encompass the dolphins' historical resting period, allowing the dolphins to enter the bay undisturbed and stay throughout the main portion of their daytime rest period, while also allowing for other human uses to occur in the areas after 3PM. We believe that the mandatory time-area closures between the hours of 6AM to 3PM and swim-with and approach regulations would provide protection to Hawaiian spinner dolphins, by reducing close encounters between spinner dolphins and humans that result in take and would reduce the intensity of activities within essential daytime habitats that are targeted by people for dolphin-directed activities.
The bays and times of day identified for time-area closures	2.7.2	**Comment 33:** Several members of the Hoʻokena community advocated closing Kauhakō Bay to swimming with dolphins with the aim of restoring their akule fishery. Anecdotal observations by community members indicate they have seen no akule in Kauhakō Bay since 1997 which coincides with the time when swimming with dolphins became popular in their bay.	While we recognize that Kauhakō bay faces intense pressure from people approaching spinner dolphins and are working with members of the Hoʻokena community to increase outreach and education to the public, we anticipate that 50-yard approach would help address disturbance issues in Kauhakō Bay. Restoration of the akule fishery is outside the scope of this rule; however, we plan to continue working with the community and the state of Hawaiʻi to address the community's concerns at this location. We expect that the mandatory time-area closure and swim-with and approach regulations would reduce the intensity of dolphin-directed activities within essential daytime habitats as much as is possible at this site.
The bays and times of day identified for time-area closures	2.7.2	**Comment 34:** Several commenters noted that La Perouse Bay banned the use of kayaks in the bay in 2006. These commenters observed that the dolphins, which used to frequent the area, no longer use that essential daytime habitat to the same extent following the ban on kayaks. The commenters suggest that the number of dolphins using La Perouse Bay has	In 2004, the State of Hawaiʻi declared the ʻAhihi-Kinaʻu Natural Area Reserve and neighboring La Perouse Bay off limits to commercial kayaking and other commercial operations. The State has not banned non-commercial operations, such as using a personally-owned kayaks, within in the Bay. Although dolphins have been observed using La Perouse Bay since 2006, if the number of dolphins using the bay for resting habitat is less than the number of dolphins using the bay prior to 2006 as the commenters suggest, it is not possible to attribute the abundance of dolphins in certain bays to one factor such as the number of kayaks. Dolphins choose their resting habitat for a number of factors,

		decreased because kayakers are no longer using the bay, leading the commenters to suggest that the dolphins enjoy the presence of kayaks.	which is described further in the response to Comment 1. Any number of these factors can cause a change in habitat preference.
Suggestions on other areas that should be considered for time-area closures.	2.7.2	**Comment 35:** NMFS received comments suggesting that if closures are implemented, time-area closures should also be considered in Hulopoʻe and Manele bays on Lānaʻi, Honolua Bay on Maui, and Makua Bay on Oʻahu because these areas are also targeted by tour operators and swimmers and, specific to Makua Bay, because they claim that it is a spinner dolphin nursery.	In a separate rulemaking we will be proposing time-area closures based on Alternatives provided in the DEIS and the 2016 proposed rule. The sites we will be proposing for time-area closures are descried in the DEIS as areas reported as having a high level of chronic human disturbance at daytime essential resting habitat. Should we consider implementing additional time-area closures other than the 5 selected sites described in the DEIS, we will look closely at the areas identified by the commenter, likely using a step-down process similar to that used in the DEIS Appendix A.
Alternate management strategies.	2.9.5	**Comment 36:** Several commenters asked why we couldn't make the Coral Reef Alliance (CORAL) West Hawaiʻi Voluntary Standards (WHVS) into enforceable regulations. The WHVS were created by the CORAL, with stakeholder input and consensus by a wide variety of Hawaiʻi Island community members, to apply to all wildlife viewing and interactions in West Hawaiʻi. This includes viewing and interaction guidelines for marine mammals, including Hawaiian spinner dolphins (WHVS 2009). Measures under section 4.6 of the document include educational information about prohibitions already outlined in the MMPA; detailed boating courtesy,	In the DEIS, we considered promulgating regulations based on the WHVS as an alternative to enhance protections for Hawaiian spinner dolphins but eliminated it from further consideration because these standards did not meet the primary criteria necessary to effectively address our purpose and need, which is to reduce the threat of take to Hawaiian spinner dolphins, including harassment and disturbance caused by dolphin-directed activities that are concentrated in coastal waters, and to address chronic interaction and viewing impacts on resident stocks of Hawaiian spinner dolphins (see Section 1.1 of the DEIS). As outlined in section 2.9.5 of the DEIS, the WHVS standards are mainly adapted for marine recreational providers (tour operators); therefore, some measures, such as restricting the number of boats surrounding a pod of dolphins to no more than three at a time, do not convert well to all user groups and may not be easily understood by other resource users. Further, the complexity of certain standards, such as no boat staying longer than 30 minutes with a pod, but boats being allowed to return to a pod for an additional 30 minute time period after a minimum of 1 hour away from the pod and as long as doing so does

		etiquette, recommendations and safety measures around marine mammals and swimmers; and detailed human activities to avoid when viewing and interacting with marine mammals. In addition, section 4.7 focuses on voluntary standards specific to spinner dolphins.	not exceed the three boat maximum, makes them difficult to follow and enforce. We also note that the measures addressed in the WHVS were narrowly focused on commercial activities and areas on the west coast of Hawai‘i Island and, although we recognize that some of the standards could be adapted to apply to waters throughout the state, not all would easily transfer to other areas. Finally, the WHVS do not apply to individuals who choose to swim, kayak, or otherwise approach the dolphins on their own apart from a commercial tour operation, leaving the dolphins vulnerable to disturbance by a large sector of the population in Hawai‘i. The combination of these factors led to the decision to eliminate this alternative from further analysis. Although the conversion of the WHVS to regulations was not fully considered as an alternative for the proposed regulations, several of the standards, such as measures that prohibit leap-frogging or promote time-area closures, were incorporated and fully evaluated in other alternatives and were considered in the proposed rule (see Alternatives 3A, 4, and 5 in the DEIS). Because this final rule promulgates the regulations outlined under Alternative 4, leap-frogging prohibitions will become an enforceable regulation.
Alternate management strategies.	2.9.3	**Comment 37:** A number of commenters suggested that it is essential to have a strong educational component in order for new regulations to be effective. Additionally, many commenters suggested that regulations would not be necessary if swimmers and vessels were educated about the impacts of close approach of spinner dolphins by humans, advocating for self-regulation rather than this proposed rule.	We agree that conducting outreach and education with the public and tour industry is essential to promote compliance with any new regulation and reduce the impacts on spinner dolphins caused by close approach by humans. We have developed a communications plan for the new regulations, which includes a robust education and outreach effort with many partners, including state and federal government partners, non-profit organizations, researchers, and community/citizen groups. Based on the lack of consistent compliance with voluntary measures to protect Hawaiian spinner dolphins to date (e.g., wildlife viewing guidelines, NMFS guidelines, and the CORAL West Hawai‘i Voluntary Standards) as well as the sheer number of people wanting to be in proximity to the dolphins, we anticipate that relying solely upon education and self-regulation would have limited success in reducing the overall intensity of dolphin-directed activities in most areas.

Alternate management strategies.	2.9.2	**Comment 38:** Multiple commenters suggested that, in lieu of the proposed rule, NMFS or the State of Hawai‘i should institute a permit program. In these comments, this permit program could take numerous forms. One suggestion is to establish a permit system for operators that would require the operators to participate in a training program on proper dolphin viewing practices before they are allowed to operate swim-with dolphin tours. Another suggestion is to establish a permit system that educates swim-with dolphin tour participants on proper dolphin viewing practices before they can participate in a guided tour. Additionally, 13 commenters suggested using a permit system to limit the total number of human users in order to limit the impact of close approach by humans on dolphins. Commenters also suggested other permitting strategies, such as limiting human activity to non-motorized vessels only, limiting the number of tour operators allowed to conduct swim-with dolphin tours, and limiting the number of people allowed per vessel. Finally, some of these commenters suggested that funding generated through the permit system	We considered and eliminated from further analysis the alternative of licensing and permitting of commercial tour operators because this alternative would not meet the purpose and need of the action, which includes reducing the threat of take to Hawaiian spinner dolphins caused by all dolphin-directed activities in coastal waters of Hawai‘i. In considering whether this should be analyzed as an alternative, we found that such a system would incur a high operational cost, would not resolve the threats from stakeholders other than tour operators (such as personal vessels and swimmers from the shore), may infringe on existing Coast Guard and State permitting systems, and does not align with authorizations provided under Section 104 of the MMPA, which only allows permitting take for certain activities, such as commercial fisheries, public display, scientific research, or enhancing the survival or recovery of a species or stock. Given these complexities and the inability to meet the purpose and need, we eliminated this alternative from further consideration.

		could be used to support research/education efforts.	
Alternate management strategies.	2.9.6	**Comment 39:** Several commenters suggested alternative solutions, such as enforcing a limit on the number of vessels and swimmers allowed in a bay at one time, with one additional commenter suggesting that a limit be enforced on the number of people allowed per tour boat.	Although particularly high numbers of swimmers and vessels can be problematic, limiting the number of human users allowed in a dolphin resting bay at any given time can still result in take if the human users closely approach the dolphins. Placing limits on the number of users allowed in a bay would also introduce uneceesary difficulties in enforcement. Therefore, we concluded that such limitations would not adequately meet the conservation purpose of this rule, which is to prevent take.
Alternate management strategies.	1.5.3	**Comment 40:** Several commenters suggested that the proposed rule was not developed with community input or recommendations and that NOAA should engage community members and tour operators to hear local concerns and to develop a new regulation. Several commenters suggested that this could take the form of a committee of local community members, which would advise NOAA on formulating a new regulation.	We recognize the importance of community and stakeholder input when creating a regulation and therefore, we took steps to solicit and incorporate community input and recommendations into the rulemaking process. The process for enhancing protections for Hawaiian spinner dolphins from human disturbance began in 2005, when we published an Advanced Notice of Proposed Rulemaking (ANPR) (70 FR 73426; December 12, 2005), which was followed by a Notice of Intent to prepare an Environmental Impact Statement for this proposed rule (71 FR 57923; October 2, 2006). In this notice, we identified five preliminary alternatives for public consideration and comment, and invited information from the public on the scope of the issues that should be addressed in a Draft EIS, the issues of concern regarding practical considerations involved in applying the proposed regulations, and identifying environmental and socioeconomic concerns to be addressed in the analysis. In 2006, we also held five public scoping meetings on the islands of Kaua‘i, O‘ahu, Maui, and Hawai‘i, and collected 4,641 public comments in response to the ANPR and the NOI. Comments submitted during this process included many that focused on cultural issues (e.g., accommodating local culture and livelihoods as well as the visitor industry) and traditional Hawaiian knowledge (e.g., recommending that researchers listen to Native Hawaiians’ knowledge instead of relying on outside research). In addition to these public scoping meetings, we attended a forum organized by State Senator

			Colleen Hanabusa's office specifically for the kupuna (elders) of the Waiʻanae community to voice their opinions. Feedback heard during this forum is summarized in the April 2007 scoping summary report, available at www.fpir.noaa.gov/PRD/prd_spinner_EIS.html. Full details regarding how we collected, analyzed, and responded to comments on the ANPR and the notice are available in section 1.5.3 of the DEIS. In addition to this scoping process to develop the proposed rule, and further addressing the comment that we should gather local concerns from community members and tour operators, we held 6 public hearings on the proposed rule in September 2016, in which 145 attendees provided their oral testimony on the proposed rule. These attendees included community members, native Hawaiian community leaders, tour operators, researchers, and government officials. We then took these 145 testimonies, along with over 22,000 additional comments received during the public comment period, and modified the final rule to address community concerns. See section titled "Changes from Proposed Rule" in the final rule background, which highlights the differences between the proposed rule and the final rule.
Alternate management strategies.	3.4.4.1	**Comment 41:** One commenter specifically mentions the Waiʻanae Baseline Environmental Study and the West Oʻahu Ocean Protocols as existing examples of community efforts to address the issue of spinner dolphin harassment and states that these two documents are not referred to in the DEIS.	The West Oʻahu Ocean Operation Protocols and the subsequent Waiʻanae baseline Environmental Study were developed with a goal of reducing conflict among multiple ocean users, not reducing spinner dolphin disturbance as a result of close human approach. These two products (the West Oʻahu Ocean Operational Protocols and the Waiʻanae Baseline Environmental Study) stemmed from Act 6, passed by the Hawaiʻi State Legislature in 2006, which directed DLNR to establish waters in West Oʻahu as an Ocean Recreation Management Area in order to "limit the locations, times, and types of permitted ocean recreation activities" (DOBOR, 2009). This state legislation was passed to minimize conflict among multiple ocean users, such as between tourism industry vessels and fishing vessels. As a result, the West Oʻahu Ocean Operation Protocols and the subsequent Waiʻanae baseline Environmental Study were developed with a goal of reducing

			conflict among multiple ocean users, not reducing spinner dolphin disturbance as a result of close human approach. Although we do reference the Waiʻanae Baseline Environmental Study in the DEIS when discussing conflicts between akule fishing and the tourism industry when those uses overlap (DEIS section 3.4.4.1), our focus in this rule is to establish protections for spinner dolphins from close approach under the MMPA, not to manage interactions between two different industries.
Alternate management strategies.	2.9	**Comment 42:** Commenters suggested our consideration of a designated swim-with area in the bays where it would be permissible to swim with the dolphins. One commenter suggested, rather than implementing swim-with and approach regulations, that we consider closing two bays to dolphin swimming for 10 years, then studying to compare the difference between dolphin health in the closed bays v. the open bays. Several commenters suggested roping off half of 2 bays to study whether the dolphins would choose to interact with people or not, believing that the dolphins are not harmed by interacting with people but rather seek them out and enjoy it.	As noted in the final rule and FEIS, the MMPA provides limited exceptions to the prohibitions on take (e.g., scientific research permits) and requires that people and organizations conduct wildlife viewing in a manner that does not cause take. Because close interactions with marine mammals are likely to result in take, including harassment and disturbance, we cannot support, condone, approve, or authorize attempting to swim with, pet, touch, or elicit a reaction from dolphins. We intend to study the effectiveness of the rule after it is implemented and recognize there are numerous ways to test hypotheses and efficacy of different management strategies. However, we have chosen Alternative 4 as the best way to immediately relieve the pressure on the dolphins in all places where they rest and engage in their essential daytime behaviors.
Hawaiian cultural concerns	3.4	**Comment 43:** One commenter expressed concern that Native Hawaiians practicing a traditional burial of a marine mammal could be fined under this regulation.	This regulation has no effect on traditional burials of marine mammals. The NOAA Marine Mammal Health and Stranding Response Program oversees and regulates all responses to stranded marine mammals in the United States, including traditional burial of a marine mammal and other cultural practices. In Hawaiʻi, we make every effort to engage Hawaiian cultural practitioners in marine mammal stranding responses, whenever possible and in compliance with the MMPA. These cultural

			practitioners can help us be culturally respectful of the individual animal and the community where the stranding occurs. In order to be in compliance with the MMPA (in addition to regulation established by this final rule), all responders must be authorized as a regional stranding network participant (in accordance with Section 112(c) and Section 403, or through Section 109(h) of the MMPA), which gives authority to state and local government employees to humanely take marine mammals in the course of their official duties.
Hawaiian cultural concerns	4.4.3.1	**Comment 44:** Some commenters expressed concern that the cultural impact analysis in the DEIS completed for this proposed rule is inadequate. One commenter states that input from Ho'okena residents has been heard and considered by NMFS, but since the proposed rule is state-wide, the cultural impact analysis needs to be expanded to include other areas in the list of proposed restricted areas. Some of these commenters recommended that, in lieu of this proposed regulation, NMFS work with local residents and elders to craft a new alternative.	We conducted a comprehensive scoping process through which we received feedback from concerned citizens including members of the native Hawaiian community, tour operators, researchers, members of the public involved in dolphin-directed activities, and other stakeholders from around the State, not just on Hawai'i island. Further detail about the public input we solicited on this regulation is available in the response to comment 40. In addition to this public input process, we initiated a separate scoping process to determine if historic properties could be affected by any of the alternatives under consideration, as required by the National Historic Preservation Act (NHPA). With assistance from Hawai'i's State Historic Preservation Division, we identified and contacted Native Hawaiian organizations, communities, and individuals, and then held four scoping meetings in 2012 with those that expressed interest in participating. Following these meetings, we contracted a consultant to conduct interviews with three lineal descendants from each of the five bays identified as potential time-area closure locations (Kealakekua Bay, Kauhakō Bay (Ho'okena), Hōnaunau Bay, Makako Bay, and La Perouse Bay), to help us identify historic properties or practices that could be affected by the suite of actions under consideration to protect Hawaiian spinner dolphins. We incorporated the findings from the initial scoping process in 2006, as well as the 2012 NHPA scoping process into the development of the various alternatives in the DEIS, and we have not received any information through the public comment period to suggest that the proposed action would hinder cultural

			practices such as those identified through the interviews with lineal descendants (e.g., fishing, canoe activities, ancestral caretaking and worship, and care of burial sites) (See section 3.4.5 in the DEIS for descriptions of activities in various bays around the state).
Enforcement	2.9.1	**Comment 45:** We received comments requesting that this rule be enforced upon all water users, including all private and commercial vessels. Conversely, we received comments requesting that the regulation be tailored so that there would be "no burden" for non-dolphin tour operators and responsible dolphin-viewing vessels, since those vessels are not harassing the dolphins.	We agree that this rule should be enforced for all water users, both private and commercial (including non-dolphin tour operators). As described in comment 1, multiple scientific studies provide evidence regarding the various and differing vessel and swimmer impacts on the behavior of spinner dolphins and how those impacts can create long term health impacts. Because spinner dolphins can be affected by numerous activities on the water, this rule applies to all water users. Exceptions are provided in the final rule (50 CFR 216.20 (c)).
Enforcement	2.9.1	**Comment 46:** Several commenters expressed concern that this rule will not be enforced, noting that DLNR has limited resources devoted to enforcement, and expressing concern that this additional regulation will not be enforced as a result. With this concern, several commenters suggested actions for NMFS to provide resources for enforcement, including providing funding to DOCARE, staffing observers in bays with lots of human activity, collecting funding from tour vessels for enforcement in the form of a licensing fee, and using fines levied on violators of this proposed rule to support enforcement.	Enforcement of the MMPA is accomplished via all available means, including through land and sea patrols conducted by the NMFS OLE, the United States Coast Guard, and DOCARE, all of whom work with us on outreach and enforcement. NMFS OLE conducts periodic patrols, which include areas with high amounts of human activity, and accepts evidence of harassment submitted by citizens observing violations. NOAA also provides funds to DOCARE through a Joint Enforcement Agreement to conduct enforcement activities, and has for some time. NMFS OLE and DOCARE are actively pursuing violations of the MMPA and will continue to do so, and OLE has recently expanded the number of agents available to do this kind of work. Regarding the suggestion to use fines levied on violators of the proposed rule to support enforcement, MMPA civil fines are currently directed into a national Asset Forfeiture Fund, which is then used to help fund enforcement activities subject to NOAA policy. Finally, with regard to the comment recommending collection of funding from tour vessel operators in the form of a licensing fee, we

			refer the commenter to our response to comment 38 regarding permitting fees.
Enforcement	2.9.1	**Comment 47:** Several commenters suggested that NMFS should focus on enforcing the MMPA, rather than creating a new regulation, since Hawaiian spinner dolphins are already protected from take by the MMPA. One commenter, noted that spinner dolphins are not threatened or endangered under the Endangered Species Act (ESA) and this regulation will set a precedent for establishing protections for non-ESA listed species, which NMFS does not acknowledge.	The MMPA protects all marine mammals in U.S. waters and on the high seas from take, which includes Level B harassment. This regulation further establishes protections for spinner dolphins under the MMPA (see the responses to comment 8 and comment 14). The commenter is correct that the spinner dolphin is not currently listed as threatened or endangered under the ESA; however, the MMPA protects all marine mammals, regardless of whether they are ESA listed, and this action is taken under authority of the MMPA to strengthen protections for spinner dolphins from increased human pressures that have resulted in observed disruption of behavioral patterns.

Appendix I – DLNR Letter of Support

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DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809
May 13, 2020

Ann M. Garrett
Assistant Regional Administrator, Protected Resources Division
NOAA Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818

Re: Support for NOAA's efforts for Enhanced Protections for Hawaiian Spinner Dolphins in Hawaii.

This letter expresses the Department of Land and Natural Resources (DLNR) support to enhance protections of Hawaiian spinner dolphins from human harassment and disturbance in Hawai'i. Specifically, DLNR supports implementation of time and area closures in key dolphin resting habitats in Hawai'i.

Hawaiian spinner dolphins hold great significance ecologically, culturally, socially, and economically throughout Hawai'i. The Department recognizes the importance of protecting Hawaiian spinner dolphins from harassment and disturbance associated with human activities.

Published studies, the Marine Mammal Commission, and numerous public comments have described the harassment and associated impacts to dolphins by swimmers and boats on the Kona coast and Maui. Studies also document negative effects of those interactions on dolphin's ability to rest, and resulting issues of foraging success, predator vulnerability, and reproductive capacity reduction.

Interestingly, during the COVID-19 Emergency Order that has suspended commercial tour operations, DLNR has received reports and observations from the public of increased spinner dolphin activity in Kealakekua Bay and other locations, including higher numbers of dolphins coming in close to shore, suggesting displacement from their natural habitat and behavioral changes during regular human operations.

While the Department recognizes the importance of sharing the native wildlife of the Islands with the public, it must be managed in a way that does not negatively impact the animals' behavior and health. As such, DLNR supports NOAA's efforts to pursue regulatory action to increase protection of Hawaiian spinner dolphins from harassment and disturbance pursuant to the Marine Mammal Protection Act and as described in alternative actions such as time and area closures in the *Enhancing Protections for Hawaiian Spinner Dolphins To Prevent Disturbance* Environmental Impact Statement.

Sincerely,

Suzanne D. Case
Chairperson

CC: Michael Tosatto, Regional Administrator, NOAA Pacific Islands Regional Office