

**Peer Review Report for  
Main Hawaiian Islands Insular False Killer Whale Distinct Population Segment  
Proposed Critical Habitat Designation:  
Draft Biological Report**

A draft biological report was prepared in support of the proposed rule to designate critical habitat designation for the Main Hawaiian Islands (MHI) Insular False Killer Whale (IFKW) Distinct Population Segment (DPS) under section 4 of the Endangered Species Act (ESA). Three peer reviewers reviewed the draft biological report: Paul Nachtigall, Ph.D., Robin Baird, Ph.D., and Mr. James Lecky. These three peer reviewers have experience working in the field of marine mammal science and management. This report provides the comments submitted by each peer reviewer and describes the actions that NMFS took to address the comments.

An anonymous number identifies each reviewer in this report and the comments are organized by the section titles of the draft biological report. Reviewer's suggested edits to text in the report are emphasized by italics. In addition to specific comments within the report, reviewer 2 submitted general comments. Most of these comments relate back to specific comments provided by this reviewer within the report. To consolidate the responses these general comments are organized within the sections where the more specific comments were raised. Comments provided by the peer reviewers helped to inform the draft biological report. The MHI IFKW DPS proposed critical habitat rule was published on November 3, 2017 (82 FR 51186). For further information visit the Pacific Islands Regional Office's false killer whale webpage:

[http://www.fpir.noaa.gov/PRD/prd\\_mhi\\_false\\_killer\\_whale.html#critical\\_habitat](http://www.fpir.noaa.gov/PRD/prd_mhi_false_killer_whale.html#critical_habitat)

## **EXECUTIVE SUMMARY**

**Referenced Text:** Section 4(a)(3)(A) of the Endangered Species Act (ESA) (16 U.S.C. 1533(a)(3)(A)) requires that, to the maximum extent prudent and determinable, critical habitat be designated for newly listed endangered and threatened species found within the United States, based on the best scientific data available.

**Reviewer 2 Comment:** Suggest paying closer attention to statutory language. The requirement is for designation “concurrently with making a determination that a species is endangered or threatened. The information standard is found in Section 4(b)(2), not 4(a)(3)(A).

**Response:** The reviewer is correct this sentence has combined information from two parts of the Act. To avoid confusing sections of the Act, this statement has been made general in the Executive Summary; however, the introduction of this report provides more detail regarding the various sections of the Act and corrects for this confusion.

**Referenced Text:** The CHRT defined the geographical area occupied by the species as island-associated marine areas in a minimum convex polygon of a 72 km radius (~39 nautical miles) extending around the MHI, with the offshore extent of the radii connected on the leeward sides of Hawaii Island and Niihau as described in Bradford et al. 2015 and the NMFS Stock Assessment Report (Carretta et al. 2016) (see Figure 3). Within the geographical area occupied, areas under consideration for critical habitat include waters

surrounding the MHI between the 45-m depth contour and the 3200-m depth contour (see Figure 5).

**Reviewer 2 Comment:** This sentence does not follow from the preceding discussion. Bradford *et al.* (2015) relies on distance from shore not depth contours. What is the source of information that supports the designation of these particular depth contours.

**Response:** The first sentence notifies the reader that the geographical area occupied by the species was determined to be equivalent to the range that is currently described by Bradford *et al.* 2015 and recognized in the NMFS Stock assessment. The second sentence separately describes the boundary of this proposed critical habitat designation. As the second sentence is not referring to the previous one, we have separated the text to avoid confusion and placed the description for the boundary determination below the discussion of the physical & biological features. We have not added additional detail to the executive summary about the depth determination; however, we have provided references to the “Specific Areas Within the Geographical Area Occupied” and the “Critical Habitat Review Team” sections of the document that provide additional detail on this topic.

**Referenced Text:** Critical habitat designations increase the protections for listed species by bringing awareness to the species’ habitat needs and by insuring that federal agency activities do not result in destruction or adverse modification of designated areas. Prohibitions against destruction and adverse modification of designated critical habitat are specific to Federal agencies. The consultation process identified in Section 7 of the ESA and outlined in joint NMFS and U.S. Fish and Wildlife regulations (50 CFR 402) establishes a method for avoiding and mitigating impacts to critical habitat. In addition to these identified protections, critical habitat designations may allow for informed natural resource planning for all stakeholders utilizing these areas.

This report summarizes the available data on MHI IFKW presence, distribution, ecological needs, and use of the identified areas and the CHRT’s process for determining these areas as meeting the definition of critical habitat for this endangered DPS.

**Reviewer 2 Suggested Edits:** Use *are not likely to result in destruction or adverse modification of designated areas* instead of do not result in destruction or adverse modification. Use *The restriction on* instead of prohibition. Reference regs as (50 CFR 402). Use *this* endangered DPS instead of the endangered DPS.

**Response:** These revisions were accepted because they align with statutory language and provide additional clarity.

## BACKGROUND

**Referenced Text:** Section 4(a)(3)(A) of the ESA (16 U.S.C. 1533(a)(3)(A)) requires that, to the maximum extent prudent and determinable, critical habitat be designated for newly listed species found within the United States.

**Reviewer 2 Comment:** The limitation of critical habitat to areas under U.S. Jurisdiction, that occurs in the regs (see 81 FR7428). Reviewer suggested the sentence be revised to read: Section 4(a)(3)(A) of the ESA (16 U.S.C. 1533(a)(3)(A)) requires that, to the maximum extent prudent and determinable, critical habitat be designated *concurrent with the listing* of species *as endangered or threatened*.

**Response:** Revisions were made to keep the language consistent with the statute.

**Referenced Text:** This report summarizes the available data on MHI IFKW presence, distribution, ecological needs, and use of the identified areas and the CHRT's process for determining these areas as meeting the definition of critical habitat for the endangered DPS.

**Reviewer 2 Suggested Edits:** Reviewer suggested swapping *this* for the before endangered DPS in the above sentence.

**Response:** Revisions accepted.

## CRITICAL HABITAT UNDER THE ESA

**Reviewer 2 General Comment:** In 2016, NMFS and USFWS completed the process of simplifying the regulations governing the process of designating critical habitat (81 FR 7413). In that process, they removed confusing and redundant terms (e.g. primary constituent elements) and relied on close adherence to the statutory language which clearly defines the process for designation. The authors of this report stray from strict adherence to the statutory and regulatory language in several areas. Of particular concern is the introduction of the undefined term: "essential feature." While this may just be convenient short hand, the term "essential feature" is not used in the ESA or the implementing regulations. The language in the statute should be used to avoid confusion or challenges.

There are also a number of issues with how the section 7 consultation process is used or referenced in the report which are highlighted in the attached copy of the report. I suggest including a discussion of the section 7 process, what it does, who it affects, and the relevance of critical habitat in the process early in the background section. There is a beginning of a discussion in the report, but it is buried on page 31 in reference to a particular risk factor. This introduction to section 7 should also include a discussion of the new definition of "adverse modification" (81 FR 7214) including consideration of the concept of "conservation value". Laying out the process and terms generally up front will facilitate understanding their use later in the report. Likewise, strict adherence to the statutory language of section 7 should be observed as well.

**Response:** We agree that using the statutory language to describe the physical and biological features will provide clarity to the reader, especially in light of our recent regulatory changes. Changes were made throughout the report to adhere to statutory terminology. With regard to the section 7 consultation process, we have included additional information in this section of the report. Specifically, we discuss the section 7 consultation process as well as new definition of "adverse modification," which includes the consideration of "conservation value."

**Referenced Text:** Section 4(b)(2) of the ESA requires NMFS to designate critical habitat for threatened and endangered species "on the basis of the best scientific data available and after taking into consideration the economic impact, impact on national security, and any other relevant impact, of specifying any particular area as critical habitat."

**Reviewer 2 Comment:** Where does this occur in this process (presumably later) and what if any role was the CHRT asked to play in assigning conservation values to particular areas for later consideration in the 4(b)(2) process.

**Response:** The 4(b)(2) Report addresses the consideration of economic, national security, and other relevant impacts of specifying any particular area as critical habitat. The CHRT did not partition the specific area or provide a conservation value for any particular portion of

this designation. The 4b2 report discusses how NMFS determined the conservation value of particular areas when weighing the benefits of exclusion v. the benefits of designation. A sentence has been added to the report to identify that these decisions are outlined in the Draft ESA Section 4(b)(2) Report and summarized in the proposed rule. The reference to this report is also cited.

**Referenced Text:** Once critical habitat is designated, Section 7 of the ESA requires Federal agencies to “insure” that they do not fund, authorize, or carry out any actions that is not likely to destroy or adversely modify that habitat. This is in addition to the requirement under Section 7 of the ESA that Federal agencies insure their actions are not likely to jeopardize the continued existence of listed species.

**Reviewer 2 Suggested Edits:** Use *is not likely* to destroy or adversely modify that habitat and *are not likely* to jeopardize the continued existence of listed species.

**Response:** Revisions were accepted to keep the language consistent with the statute.

## LIFE HISTORY AND STATUS

**Reviewer 2 Comment:** The Life history and status section could be focused better on the aspects of the life history that relate to critical habitat. There is no need to revisit the justification for listing. That can be done through reference to the listing documents.

**Response:** Information has been added to the report to direct the reader to more information about the listing and recovery process, rather than repeat information provided in the listing or recovery outline. For example, little information is provided about the genetic distinction of this population because this topic is more relevant to the determination of this distinct population segment. However, some information is repeated from the status review because it is relevant in determining the habitat that will support the recovery of this population.

**Referenced Text:** Although there is overlap in the ranges (see Figure 1), these three populations are identified as demographically independent based on genetic, photo-identification, and telemetry studies and consequently, are recognized and managed separately under the Marine Mammal Protection Act (MMPA) (Carretta et al. 2008, 2013, 2016).

**Reviewer 2 Comment:** It would be helpful to reference the origin studies rather than the summary stock assessment reports.

**Response:** Revisions made as follows: (Chivers *et al.* 2007, 2010, Martien *et al.* 2011, as referenced in Carretta *et al.* 2008, 2013, 2016).

**Referenced Text:** This population was determined to be discrete from other populations based on behavioral and genetic factors, associated with their restricted range and genetic distinctions from other surrounding false killer whale populations, respectively.

**Reviewer 1 Suggested Edits:** This population was determined to be discrete from other populations based on behavioral factors associated with their restricted range, and genetic distinctions from other surrounding false killer whale populations.

**Response:** Revisions accepted.

**Referenced Text:** This DPS was listed as endangered based on the population’s high extinction risk and the insufficient conservation efforts in place to reduce that risk (77 FR 70915; November 28, 2012).

**Reviewer 3 Comment:** What are the consequences of the isolation of this small sub-population? Some statement about the introduction of the new genetic material by the male, apparently from Australia, would be worthwhile. Genetic isolation created this subpopulation. Introduction of diverse genetic material may actually strengthen it.

**Response:** This document focuses on critical habitat and the reviewer's comment focuses on a broader recovery-related issue. To resolve this comment the following sentence was added that directs readers to more information about the DPS and recovery planning efforts with hyperlinks to our websites. "Additional information about this DPS and recovery planning may be found on MHI IFKW page of our website."

**Referenced Text:** There are no recognized morphological features that distinguish this DPS from other false killer whales; the excerpts below from the 2010 Status Review (Oleson *et al.* 2010), which reviewed the biology of this population to consider whether this population may require protections under the ESA, provides a general description of the species and [Figure 2](#) provides a depiction of this species.

**Reviewer 3 Comment:** There are no morphological or characteristic differences other than genetic?

**Response:** Kitchener *et al.* 1990 has found morphological divergence between populations from Scotland, Australia, and Africa; however, similar comparisons have not been made for Hawaii's populations. The referenced sentence is correct as stated.

### Life History and Reproduction

**Referenced Text:** Females are reported to reach sexual maturity between 8 and 11 years of age at lengths ranging from 320 to 427 cm; reports of males reaching sexual maturity range more widely in age from 5 to 19 years of age at lengths ranging from 396 to 457 cm (Kasuya 1986, Stacey *et al.* 1994, Odell and McClune 1999, Ferreira *et al.* 2014).

**Reviewer 1 Comment:** It is worth noting that body length and thus relative lengths at different ages (and at sexual maturity) varies between populations (Ferreira *et al.* 2014) and it is not known how the Hawaii DPS fit in, e.g., are the individuals on the larger or smaller end of the range. Only a couple have been measured and they have been relatively small (see Baird 2016).

**Response:** The following sentences have been added to this paragraph. Based on examining false killer whales from Japan and South Africa and reviewing scientific literature, Ferreira *et al.* (2014) noted that adult false killer whales from different geographic areas (and even from the same area) can differ significantly in mean body size. It is not clear where along the size range this DPS may fall. Only a few stranded animals have been measured from this DPS and they have been relatively small (Baird *et al.* 2016). West *et al.* 2016 reports two female false killer whales age 20 and 22 measuring 405 and 421 cm, respectively, and one male false killer whale age 24 measuring 445 cm.

**Referenced Text:** Using the annual pregnancy rates reported in Ferreira (2008), Oleson *et al.* (2010) calculated an inter-birth interval of 8.8 years for animals examined from Japan, which is low compared to other delphinids with similar life history (e.g., killer whales, short-finned pilot whales, and sperm whales).

**Reviewer 1 Comment:** Do the Oleson *et al.* calculations assume that females do not have a post-reproductive phase? If so, this should be stated, as that would be the average inter-birth

interval for all females, but since those  $> \sim 45$  are not reproducing those that are reproducing will have shorter average inter-birth intervals. It should also be noted though that the central tropical Pacific has relatively low productivity, and animals in such areas may have longer inter-birth intervals than those in highly productive areas. Include references for these other species. Delete sperm whale, which is not a delphinid, or edit the sentence to say other species.

**Response:** The following sentences have been added to this paragraph to clarify that calculations do not assume that females have a post-reproductive phase. “However, a shorter average inter-birth interval would be calculated from an annual pregnancy rate were it to exclude post-reproductive females. The inter-birth interval for the MHI IFKW is unknown; however, the relatively low productivity in the central tropical Pacific may mean this DPS has a longer inter-birth interval than false killer whales found in areas with higher productivity.” Additionally, sperm whales was removed from the list of examples of other delphinids.

**Referenced Text:** Photopoulou et al. (2017) further analyzed these samples and found both morphological and statistical evidence for a post-reproductive lifespan in false killer whales, similar to that demonstrated in short-finned pilot whales and killer whales.

**Reviewer 2 Comment:** References list this as 2016. Which is correct?

**Response:** This has been corrected in the list of references to state 2017.

### Vocalization, Hearing, and Underwater Sound

**Referenced Text:** Adapting to an aquatic habitat where sound propagates extremely well, odontocetes, such as false killer whales, have evolved highly complex acoustic sensory systems through which they produce, receive, and interpret sounds to support navigation, communication, and foraging (Au 2000, Olsen et al. 2010). Similar to bats – these animals use echolocation (or biosonar) to locate objects within their environment producing sounds, and then receiving and interpreting the returning echoes.

**Reviewer 2 Comment:** This phrase (referring to “Adapting to an aquatic habitat where sound propagates extremely well”) makes this an awkward sentence and it isn’t really necessary. Suggest deleting it.

**Response:** Revision accepted.

**Reviewer 2 Comment:** The objects don’t produce sound. Suggest deleting “producing sounds.”

**Response:** This sentence contained a typo and has been revised to read: “Commonly referred to as echolocation or biosonar, these animals – similar to bats - use their ability to produce sounds to locate objects within their environment by receiving and interpreting the returning echoes from their own vocalizations.”

**Referenced Text:** In a captive environment, Thomas et al. (1988) conducted an underwater audiogram on a young (4-year old) false killer whale and reported the most sensitive range of hearing from 16 to 64 kHz, but noted that the whale has good sensitivity (i.e., within -40 dB) from 8 to 105 kHz (Thomas et al. 1988 as cited in Thomas and Turl 1990).

**Reviewer 3 Comment:** No mention of Yuen's work whose audiograms are well published and well cited.

Yuen, M.E., Nachtigall, P.E., and Supin, A.Ya., and Breese, M. (2005) Behavioral and auditory evoked potential audiograms of a false killer whale (*Pseudorca crassidens*). *Journal of the Acoustical Society of America*, 118 (4) 2688-2695

Also

Thomas, J. Chun, N. Au. WWL, and Pugh D. (1988) Underwater Audiogram of the False Killer whale. *JASA* 936-940

It would be good to take a look at

Au, W.W.L., Nachtigall, P.E., and Pawloski, J.L. (1997) Acoustic effects of the ATOC signal (75 Hz, 195 dB) on dolphins and whales. *Journal of the Acoustical Society of America*, 101, 2973-2977.

It has data on hearing thresholds for *Pseudorca* down below 1 kHz. Later concerns are indicated about construction and windfarm sounds. Those are similar low frequency sounds. Data about low frequency sounds seem relevant.

**Response:** After review of the suggested information, the following was added to this section of the report to provide additional information about false killer whale hearing, including information about audiograms and low-frequency hearing.

“Yuen et al. (2005) conducted behavioral and Auditory Evoked Potential (AEP) audiograms on a 30-year old female and reported best sensitivity between 16 and 24 kHz and peak sensitivity at 20 kHz for behavioral data. AEP audiograms showed best sensitivity from 16 to 22.5 kHz and peak sensitivity at 22.5 kHz. Notably the researchers hypothesized that this whale may have experienced hearing loss associated with age or presbycusis, because earlier studies indicated exceptional hearing capabilities for this animal. Kloepper et al. (2010) reported a decrease in echolocation performance for this individual following the high-frequency hearing loss and suggested that hearing at ultrasonic frequencies may have evolved in response to pressures for fine-scale echolocation discrimination. Au et al. (1997) tested hearing sensitivity of this species to a low-frequency 75 Hz phase modulated, 195 dB re 1 $\mu$ Pa source level acoustic signal and reported thresholds of 140.7 $\pm$ 1.7 dB for a 75-Hz pure tone signal and 139.0 $\pm$ 1.1 dB for the phase modulated signal.”

**Referenced Text:** Nachtigall and Supin (2008) described this ability as an active ‘automatic gain control’ and note that hearing sensitivity becomes most acute while searching for targets (Supin et al. 2008, Nachtigall and Supin 2013).

**Reviewer 2 Comment:** Supin et al. 2008 is missing from references.

**Response:** The following reference was added to the list of references: *Supin, A. Y., P. E. Nachtigall, et al. (2008). "Hearing sensitivity during target presence and absence while a whale echolocates." The Journal of the Acoustical Society of America 123(1): 534-541.*

**Referenced Text:** Differences in source level and spectral dominance, as well as instances where free-ranging false killer whales used short click trains (similar to captive belugas) indicate that there is still more to learn about how these false killer whales’ employ acoustic signals within their natural environment to navigate, forage, and communicate. At a minimum both captive and free-range studies demonstrate that these animals rely on sound as a fundamental component of their habitat to navigate, communicate, avoid predators, and locate prey.

**Reviewer 3 Comment:** Suggest a look at Kloepper's work on echolocation.

*Pseudorca* has an outstanding ability to echolocate and it is reasonable to mention it.

*Kloepper, L. Gisinger, R. L. and Nachtigall, P.E. (2010) Decreased Echolocation Performance following High Frequency Hearing Loss in the False Killer Whale J Exp Biol 213, 3717-3722*

**Response:** Information from Kloepper's work was added earlier in this section when discussing hearing and the impacts of hearing loss.

**Reviewer 2 Suggested Edits:** Delete "At a minimum" from the last sentence of the above referenced text.

**Response:** Revision accepted.

**Referenced Text:** Additionally, the soundscape differs by the sources that contribute to noise within the environment; these sources may be from physical, biological, or anthropogenic noise.

**Reviewer 2 Suggested Edits:** Additionally, the soundscape differs by the sources that contribute to noise within the environment; *noise* may be from physical, biological, or anthropogenic *sources*.

**Response:** Revision accepted.

**Referenced Text:** Considering how human activities may change the soundscape and determining the biological significance of that change can be complex as it includes the consideration of many variables, such as the characteristics of human noise sources (frequency content, duration, and intensity), the animal of concern's ability to produce, receive sound, and adapt to other sounds within their environment, the physical characteristics of the habitat, the baseline soundscape, and how the animal uses that habitat (Shannon et al. 2015, Hatch et al. 2016, Erbe et al. 2016).

**Reviewer 2 Comment:** Suggest breaking this into two or more sentences.

**Response:** The referenced text was split into two sentences as follows:

"Considering how human activities may change the soundscape and determining the biological significance of that change can be complex as it includes the consideration of many variables. These variable include the characteristics of human noise sources (frequency content, duration, and intensity); the animal of concern's ability to produce, receive sound, and adapt to other sounds within their environment; the physical characteristics of the habitat; the baseline soundscape; and how the animal uses that habitat (Shannon et al. 2015, Hatch et al. 2016, Erbe et al. 2016)."

**Referenced Text:** Noise with certain characteristics may cause animals to avoid or abandon important habitat, or can mask - or interfere with the detection, recognition, or discrimination of - important acoustic cues within that habitat (Gedamke et al. 2016). In these cases, the duration of the offending or masking noise will determine whether the effects or degradation to the habitat may be temporary or chronic and whether such alterations to the soundscape may alter the conservation value of that habitat.

**Reviewer 3 Comment:** Perhaps some of the masked hearing studies with false killer whales should be mentioned in this context.

**Response:** NMFS is contacting this peer reviewer for more specificity and soliciting additional information on this topic in the proposed rule.

**Reviewer 2 Comment:** Conservation value is an important part of the recently defined term "Destruction or adverse modification" (50 CFR 402.02, 81FR 7214). A discussion of the



term in the discussion of section 7 process above would be useful in framing the use of the term here.

**Response:** Additional information has been added to the “Critical Habitat Under the ESA” section of this report as follows:

“Joint NMFS-USFWS regulations at 50 CFR 402.02 (81 FR 7214; February 11, 2016) define destruction or adverse modification as “a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of the species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.”

### False Killer Whales around Hawaii

**Referenced Text:** The Hawaiian Islands are part of the Hawaiian-Emperor Seamount Chain. These submerged mountains disrupt and influence basin-wide oceanographic and atmospheric processes, which in turn influence the productivity in the surrounding waters (Oleson et al. 2010, Martien et al. 2014, Gove et al. 2016).

**Reviewer 2 Comment:** They are not all “submerged .”

**Response:** Text has been revised in this sentence to indicate that the chain includes “submerged and partially submerged mountains.”

**Referenced Text:** Referred to as the “Island Mass Effect,” islands (land surrounded by water) and atolls (a ring-shaped reef, or grouping of small islands that surrounding a lagoon) can create a self-fueling cycle where the geomorphic type (atoll vs. island), bathymetric slope, reef area, and local human impacts (e.g., human-derived nutrient input) influence the phytoplankton biomass and the trophic-structure of the entire surrounding marine ecosystem (Doty and Oguri 1956, Gove et al. 2016).

**Reviewer 1 Suggested Edits:** (a ring-shaped reef, or grouping of small islands that *surround* a lagoon)

**Response:** Revision accepted.

**Referenced Text:** Extending for nearly 2400 km from Kure Atoll in the northwest to Hawaii Island in the southeast, differences in geographical location and landmass contribute to ecological differences between the NWHI and the MHI (Oleson et al. 2010, 2012). The NWHI include a series of low-lying atolls and islands, which are one-tenth of one percent of the land area in the entire Archipelago (Rauzon 2001). Productivity and temperatures fluctuate widely over the year and across years in this area of the chain, where ecosystems are influenced by the northern location and proximity to other shifting oceanographic features (e.g., transition zone chlorophyll front) (Baker et al. 2011). These older islands and atolls are vulnerable to the elements and to rising sea levels (Baker et al. 2006).

**Reviewer 2 Comment:** Awkward. Seems unrelated to phrase that follows. In the sentence starting with “Productivity” - Not clear what area this refers to. If it’s the NWHI, say that.

**Response:** This paragraph was revised for clarification purposes and now reads as follows: “*Differences in geographical location and landmass contribute to ecological differences between the NWHI and the MHI (Oleson et al. 2010, 2012). The Hawaiian archipelago extends for nearly 2,400 km from Kure Atoll in the northwest to Hawaii Island in the southeast. The NWHI include a series of low-lying atolls and islands, which are one-tenth of*

one percent of the land area in the entire Archipelago (Rauzon 2001). Productivity and temperatures fluctuate widely over the year and across years in *the NWHI*, where ecosystems are influenced by the northern location and proximity to other shifting oceanographic features (e.g., transition zone chlorophyll front) (Baker et al. 2011). These older islands and atolls are vulnerable to the elements and to rising sea levels (Baker et al. 2006).”

**Referenced Text:** For example, spinner dolphin populations of the NWHI demonstrate long-term group fidelity and social stability, which contrasts with the social groupings that change in size and composition in the MHI spinner dolphin populations. Researchers suggested that this difference in social structure might be in response to the remoteness, isolation, and limited resting habitats of the northwestern atolls (Karczmarski et al. 2005, Andrews et al. 2010).

**Reviewer 2 Comment:** Provide reference for the first sentence and describe which researchers suggested that this difference in social structure exists.

**Response:** The citation has been moved to more clearly articulate the appropriate researchers associated with each sentence.

For example, spinner dolphin populations of the NWHI demonstrate long-term group fidelity and social stability, which contrasts with the social groupings that change in size and composition in the MHI spinner dolphin populations (Karczmarski et al. 2005, Andrews et al. 2010). Karczmarski et al. (2005) suggested that this difference in social structure might be in response to the remoteness, isolation, and limited resting habitats of the northwestern atolls.

**Referenced Text:** Ultimately, this DPS distinction from other populations may reflect foraging specialization specific to the MHI habitats.

**Reviewer 2 Comment:** Change “this” DPS to “the MHI IFKW” DPS and provide a reference for this sentence.

**Response:** Revision accepted and Martien *et al.* 2014 is cited for this sentence.

### Population Status and Trends

**Referenced Text:** The 2015 and draft 2016 Stock Assessment Reports (SAR) report the best estimate of population size for the MHI IFKW as 151 animals (CV=0.20) (Carretta et al. 2016 and 2016b).

**Reviewer 2 Comment:** Referring to the citations - If there is a “b” shouldn’t there be an “a.”

**Response:** Correction made to first citation to indicate it is *Carretta et al. 2016a*.

**Referenced Text:** Preliminary analyses indicate abundance estimates not largely different from those reported by the 2015 SAR; however, the difference in methodology suggests these preliminary numbers may be an underestimate of true population abundance in a given year (Oleson February 14, 2017 presentation to the Pacific Scientific Review Group).

**Reviewer 2 Comment:** Referring to the SAR - Is this Carretta et al. 2015?

**Response:** Correction made to cite this as *Carretta et al. 2016a*.

**Referenced Text:** A complete history of MHI IFKW status and trends is unknown; however, the 2015 SAR provides an overview of information that suggests this DPS has experienced a historical decline.

**Reviewer 1 Comment:** In addition, Silva et al. note that sighting data off Maui County suggest a decline in that area between 1995 and 2011 (Silva et al. 2013, Aquatic Mammals 39:409-414).

**Response:** The following sentence provides additional information about encounters in Maui County waters and this reference has been added to the report.

“In addition, Silva et al. (2013) reports that the rate of encounter of false killer whales in leeward Maui County waters in 1995 was over five times greater than in 2011.”

### Range

**Referenced Text:** Overall, tracking information from 31 MHI IFKWs (23 from Cluster 1 and 8 from Cluster 3) suggested that the DPS has a much smaller range than previously thought, and that the use of habitat is not uniform around the islands (Bradford et al. 2015).

**Reviewer 1 Comment:** This is the first time that these social clusters are noted – it would be good to define them, or at least reference the next section

**Response:** A reference to the next section has been added.

**Referenced Text:** Since this analysis, a single individual from Cluster 2 was tagged and several more individuals from Cluster 3; tracking information received from these animals are contained within the revised boundary established by the 2015 SAR (Carretta *et al.* 2016; Baird, pers. communication, November 7, 2016).

**Reviewer 1 Suggested Edits:** Actually three individuals tagged, but all three remained together during the period of tag overlap, so effectively 1 group that was tagged. Since this analysis, *three* individuals from Cluster 2 *were* tagged, *as was one individual* from Cluster 3 *and two from Cluster 1*; tracking information received from these animals are contained within the revised boundary established by the 2015 SAR (Carretta et al. 2016; Baird, pers. communication, November 7, 2016).

**Response:** Revisions accepted.

### Group Dynamics and Social Network

**Referenced Text:** Globally, estimates of false killer whale group size vary widely from a couple of animals to hundreds and this variation is likely indicative of differences in sampling methods (Oleson et al. 2010).

**Reviewer 1 Comment:** This sentence is misleading and needs to be reworded. Average group sizes may naturally vary among areas due to ecological differences, just as they do for other species. Group size estimates for false killer whales in particular can vary due to differences in sampling methods (discussed in Baird et al. 2008 MMS and in Bradford et al. 2014 PLOS One), given how spread out groups are. I think it would be good to re-word the sentence to capture one or both of these factors, but right now it confounds them.

**Response:** After review, the sentence was removed because this report is focused on MHI IFKW ecology and explaining this topic further does not add to the overall purpose of this report. However, this is discussed more thoroughly in the species status assessment and care will be taken to not confound this information.

**Referenced Text:** Studies in Hawaii indicate that MHI IFKW's are most commonly observed in groups of about 10 to 20 animals; these groups may be part of a larger aggregation of subgroups that are dispersed over a wider area (Baird et al. 2008, Reeves et al. 2009, Baird et al. 2010, Oleson et al. 2010).

**Reviewer 1 Comment:** More details on how wide an area would be worth noting, since this is directly relevant to the importance for acoustic communication over wide areas and thus for the potential for disruption by anthropogenic sounds. Add Bradford *et al.* 2014 to citation.

**Response:** Additional information has been added to this section to note that these subgroups may be separated between 2-10 km, or more, as noted in Baird et al. 2008. Additional citation accepted.

**Referenced Text:** This DPS demonstrates social structure; observations from field studies indicate that uniquely identified individuals associate and regularly interact with at least one or more common individuals (Baird 2009, Baird et al. 2010).

**Reviewer 1 Comment and Suggested Edits:** Technically every animal has a social structure, some are just more complex than others. Recommended text: *This DPS has a complex social structure...*

**Response:** Revisions accepted.

**Referenced Text:** Social network analyses once divided the population into three broad social clusters based on these connections (Baird et al. 2012); however, increased information from field studies indicates more complexity in these social connections and a fourth social cluster has recently been identified (Robin Baird, pers. comm. October 2016 and June 2017). Although future information may distinguish further differences in the social clusters, we use Clusters 1, 2, and 3, at times in this report to note differences in movement and habitat use patterns described by past analyses; further delineations in groupings may slightly alter how these patterns are described in the future.

**Reviewer 1 Suggested Edits:** The fourth cluster information may be referenced as: Mahaffy, S.D., R.W. Baird, A.M. Gorgone, T. Cullins, D.J. McSweeney and D.L. Webster. 2017. Group dynamics of the endangered insular population of false killer whales in Hawaii. In Abstracts of the 22nd Biennial Conference on the Biology of Marine Mammals, Halifax, Nova Scotia. Recommended edits to text include:

*As analyses revealing the fourth cluster have not yet been published in detail, we use Clusters 1, 2, and 3 at times in this report to note differences in movement and habitat use patterns described by past analyses; further delineations in groupings may slightly alter how these patterns are described in the future.*

**Response:** Revisions accepted and additional reference included.

### **Movement and Habitat Use**

**Referenced Text:** Generally, they found that MHI IFKW high-use areas were on average shallower, closer to shore, and had gentler slopes in comparison to other areas in this DPS' range. Additionally, these areas had higher average surface chlorophyll-a concentrations (in comparison to low-use areas), which may be indicative of higher productivity. Baird et al. (2012) suggested that high-use areas may indicate habitats where IFKW's have increased foraging success and may be particularly important to the conservation of this DPS.

**Reviewer 2 Comment:** These sentences seem to be relevant to the selection of the depth range selected for the proposed critical habitat boundaries. A more detailed discussion of “shallower” would be helpful in understanding of the proposal.

**Response:** The following information was added to this section: “Across high-density cells, the median depth was reported as 623 m, median slope as 3, and chlorophyll-a concentrations as 0.082 mg m<sup>-3</sup>, whereas across low-density cells the median depth was reported as 1679 m, median slope as 6, and chlorophyll-a concentrations as 0.074 mg m<sup>-3</sup> (Baird et al. 2012).”

**Referenced Text:** For example, high-use areas for cluster 2 are not yet recognized and it is unclear whether this DPS demonstrates patterns in any particular areas.

**Reviewer 1 Suggested Edits:** Replace *DPS* with *cluster*.

**Response:** Revisions accepted.

**Referenced Text:** Recent tagging efforts increased the sample size for this dataset and now include new information from a single individual from Cluster 2, several more individuals from Cluster 3, and 1 individual from the newly-identified Cluster 4 (previously this individual was assigned to Cluster 1) (Robin Baird, pers. comm. October June 2017).

**Reviewer 1 Suggested Edits:** Recent tagging *data available through February 2017* increased the sample size and now include new information from three individuals from Cluster 2, *one* more individuals from Cluster 3, and *one* individual from the newly-identified Cluster 4 (previously this individual was assigned to Cluster 1) (Robin Baird, pers. comm. June 2017).

**Response:** Revisions accepted.

**Referenced Text:** Due to the small and resident nature of this population, these high-use areas overlap with areas that meet the definition of “biologically important areas” as established by NOAA’s CetMap program and are used to highlight areas that can assist resource managers with planning, analyses, and decisions regarding how to reduce adverse impacts to cetaceans resulting from human activities (Baird et al. 2015, Gedamke et al. 2016).

**Reviewer 2 Comment:** What is the relevance of this program? What do “biologically important areas” represent?

**Response:** We have added the following information to this section of the report provide more detail.

“In 2010, NOAA committed to improving the tools used by the Agency to manage underwater noise impacts more comprehensively, including those to better address cumulative impacts to whales, dolphins, and porpoises. Subsequently, NOAA developed the CetSound program, which includes the CetMap mapping tool that aims to improve our ability to visualize cetacean density and distribution. Under this program, the term “biologically important areas” is defined and used to identify areas recognized in scientific data as significant (e.g., reproductive areas for migratory species). Due to the small and resident nature of MHI IKFWs, the high-use areas described by Baird et al. (2012) overlap with areas that meet the definition of “biologically important areas” as defined by NOAA’s CetMap program. However, Baird et al. (2015) identifies biologically important areas as 1 standard deviation from the mean, while Baird et al. (2012) describes high-use areas using 2 standard deviations from the mean.”

## Diving behavior

**Referenced Text:** Minamikawa et al. (2013) calculated the aerobic dive limit of a false killer whale (assuming body weight as 250 kg and lean weight as 200kg) as 18.5 min using methods established by Tyack et al. (2006). The maximum dive duration of a tagged false killer whale was reported as 14.6 minutes, only 79 percent of the aerobic dive limit.

**Reviewer 1 Suggested Edits:** Add *3-m* in front of false killer whale. Add *the* in front of tagged false killer whale.

**Response:** Revisions accepted.

**Referenced Text:** Data received from depth-transmitting LIMPET satellite tags on four MHI IFKWs (3 from Cluster 3 and 1 from Cluster 1) demonstrates a maximum dive depth of 1,272 m with maximum dive durations reported as 13.85 minutes, (Baird, pers. communication, March 2017).

**Reviewer 1 Suggested Edits:** Change 13.85 to 18.65 minutes.

**Response:** Revisions accepted.

**Referenced Text:** The data demonstrate that these animals are diving greater than 50 m about twice as often during the day (0.72 dives/hour) than at night (0.35 dives/hour) (Baird pers. communication March 2017).

**Reviewer 1 Comments and Suggested Edits:** These analyses have been re-done taking out crepuscular (dawn/dusk) periods. Change to 0.71 dives/hour during the day and 0.32 dives/hour at night.

**Response:** Revisions accepted.

## Diet

**Referenced Text:** Data from the longline fishery likely represents comingled depredation events from animals representing all three Hawaiian false killer whale populations. [Table 2](#) below indicates the species reported as dietary items of MHI IFKWs.

**Reviewer 2 Comment:** Was there an analysis of observation location with respect to DPS ranges. How much longline fishing occurs within the range of the MHI IFKW?

**Response:** This information is provided in the Fisheries section of the report where we discuss the threats to the features.

**Reviewer 1 Suggested Edits for Table 2:** Insert Baird unpublished for *Albula* spp and *Lampris regius* in the reference column.

**Response:** Revisions accepted.

**Referenced Text:** However, observations are limited to those foraging events where MHI IFKW are found at or near the water's surface. In comparison, stomach content analysis from five MHI IFKWs that stranded off the Island of Hawaii (from 2010-2016) indicates that squid may play an important role in the diet along with other pelagic fish species (West 2016). Notably, data from stomach content analyses are from five whales identified as part of social Cluster 3 and it is unknown if this information may reflect differences in foraging preferences or strategy between social clusters, or if the relative health of these individuals may have influenced prey consumption just prior to death.

**Reviewer 1 Suggested Edits:** However, observations are limited to those foraging events where MHI IFKW are found at or near the water's surface, *and prey handling of mahi-mahi may be different than for other species, making captures of that species easier to detect (Baird, pers. comm.)*. In comparison, stomach content analysis from five MHI IFKWs that stranded, *four off the Island of Hawaii and one from Molokai* (from 2010-2016) indicates that squid may play an important role in the diet along with other pelagic fish species (West 2016). *However, four of the five whales were identified as part of social Cluster 3 (the social cluster of the fifth whale was not determined)*, and it is unknown if this information may reflect differences in foraging preferences or strategy between social clusters, or if the relative health of these individuals may have influenced prey consumption just prior to death.  
**Response:** Revisions accepted.

**Referenced Text:** The Status Review determined the energy requirements for the IFKW DPS based on a model developed by Noren (2011) for killer whales (Oleson et al. 2010).

**Reviewer 2 Comment:** This citations in this sentence are a bit confusing. Should this say: Oleson et al. (2010) determined the energy requirements for the IFKW DPS based on a model developed my Noreen (2011) for killer whales?

**Response:** Sentence revised to clarify that Oleson et al. 2010 calculated this using the model developed by Noren.

**Referenced Text:** Examples include: several species of squid that show increased spawning near the MHI to take advantage of higher productivity regions (Bower et al. 1999); yellowfin tuna in Hawaii appear to exhibit an island-associated, inshore-spawning run, peaking in the June-August period (Itano Holland 2000); and eddies created by the influence of the islands are known to concentrate prey resources of larger game fish (Seki et al. 2002).

**Reviewer 2 suggested edit:** insert and between Itano Holland.

**Response:** Revisions accepted.

**Referenced Text:** Most of the species identified in [Table 2](#) include species that are pelagic in nature, but that are found year-round in Hawaii's waters. Distribution of these large pelagic fish varies with seasonal changes in ocean temperature (Oleson et al. 2010).

**Reviewer 2 Comment:** Add a column to table 2 to denote which species are seasonal and which are year-round.

**Response:** We have not revised the table as recommended, as this type of revision would not accurately convey how abundance and distribution may vary for different stocks in and around different areas of the MHI. We have revised the second sentence to clarify that changes in abundance and distribution are possible.

## **PHYSICAL OR BIOLOGICAL FEATURES ESSENTIAL FOR CONSERVATION**

**Reviewer 2 Comment on this overall section:** The discussion of each of these features should be expanded with appropriate references and information to demonstrate how they are consistent with the definition of critical habitat.

**Response:** We have not revised this section as recommended. The early part of this reports provides information about each of these features and the function or role that play in the supporting MHI IFKWs with the appropriate citations included. This section provides our summary of the proposed regulatory text for the features, which is followed with a discussion

of how these features may require special management or protection. These parts of the report put together describe how these features meet the definition of critical habitat.

**Referenced Text:** Areas meeting the statutory definition within the occupied range of the listed species must contain physical or biological features essential to the conservation of the species.

**Reviewer 2 Comment and Suggested Edits:** The document should speak to this element of the definition of critical habitat as well. Insert “*and which may require special management consideration or protection,*” at the end of the sentence.

**Response:** Revisions accepted.

**Referenced Text:** Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth. MHI IFKWs are top predators that feed on a variety of large pelagic fish as well as squid. Within waters surrounding the main Hawaiian Islands, habitat conditions should support the successful growth, recruitment, and nutritional quality of prey to support the individual growth, reproduction, and development of MHI IFKWs.

**Reviewer 2 Comment:** I’m troubled by the use of the word “should” here. The designation of CH is based on features that are present not that should be present. The relevant biological feature here is prey species of sufficient abundance, quality, and availability to support reproduction and growth of MHI IFKWs and to support population growth. Those factors that weigh on growth, recruitment, and nutritional quality of prey, weigh on the need for special management or protection of the feature.

**Response:** We agree that the use of “should” does not convey the correct meaning for this sentence and have revised the sentence to read as follows: Within waters surrounding the main Hawaiian Islands, habitat conditions *that* support the successful growth, recruitment, and nutritional quality of prey *are necessary to* support the individual growth, reproduction, and development of MHI IFKWs.

**Referenced Text:** Anthropogenic noise of a certain level, intensity, and duration can alter these whales’ ability to detect, interpret, and utilize acoustic cues that support important life history functions, or can result in long-term habitat avoidance or abandonment.

**Reviewer 2 Comment:** A reference from the marine environment would be good here.

**Response:** We have not revised this section as recommended as noted in the overall comment for this section. However, references are provided in the “Vocalization, Hearing, and Underwater Sound” portion of this document.

## **GEOGRAPHICAL AREA OCCUPIED BY THE SPECIES AND SPECIFIC AREAS WITHIN THE GEOGRAPHICAL AREA OCCUPIED**

**Referenced Text:** The CHRT relied on the tagging and tracking information described in Bradford et al. (2015), as well as new data from tagging and tracking studies by Cascadia Research Collective to provide information on the current range and distribution of MHI IFKW DPS.

**Reviewer 2 Comment:** This appears to be the source of information for the proposed depth parameters of MHI IFKW critical habitat. Presumably the CHRT analyzed this data to derive the recommended range. The data used and the analysis of that data to define the depth parameters should be presented in this document as it doesn’t appear to be present in the



referenced literature. For example Bradford et al. (2015) doesn't define depth criteria for MHI IFKH habitat. Baird et al. presents depth data but on in increments of 100 meters. In the high-density cells only about 2.5% of the area is <100 m deep and the deepest area is 1700 m. In the low-density cells about 10% of the area is less than 100 m and approximately 20% of the area used is deeper than 3200 m. The rationale for the depth limits recommended in this report is not evident in the report.

**Response:** We have provided additional information in the Critical Habitat Review Team section of this report and have indicated in this section where additional information may be found.

**Referenced Text:** To be eligible for designation as critical habitat under the ESA's definition of occupied areas, each specific area must contain at least one essential feature that may require special management considerations or protection.

**Reviewer 2 Comment and edits:** Use the statutory definition: i.e. physical or biological feature. To be eligible for designation as critical habitat under the ESA's definition of occupied areas, each specific area must contain at least one *physical or biological* feature *essential to the conservation of the species, which* may require special management considerations or protection.

**Response:** Revisions accepted.

**Referenced Text:** One area has been identified as including the essential features for the MHI IFKW DPS; this area ranges from the 45-m depth contour to the 3200-m depth contour in waters that surround the main Hawaiian Islands from Niihau east to the Island of Hawaii.

**Reviewer 2 Comment:** Is there a reference for these depths? I don't see them in Baird et al. (2010). Baird et al. (2012), or discussed in the 'Movement and Habitat Use' section. Of particular concern is the lack of a reference to support the selection of 45-m depth contour?

**Response:** We have provided additional information in the Critical Habitat Review Team section of this report and have indicated in this section where additional information may be found.

**Referenced Text:** This full range of depths from 45 m to 3200 m incorporates a majority of the tracking locations of MHI IFKW and includes those island-associated habitats and features essential to the MHI IFKWS DPS (see Figure 5 and Appendix B for multiple views throughout the islands).

**Reviewer 2 Comment and edits:** Insert Appendix A instead of Appendix B.

**Response:** Revisions accepted.

## **SPECIAL MANAGEMENT CONSIDERATIONS OR PROTECTION**

There are several areas in the discussion of risk factors where the authors speculate whether an activity will be modified by the terms of a biological opinion. The speculation about whether a particular activity is likely to be modified or not confuses the purpose of the analysis. The purpose of analyzing risk factors, such as dredging, fishing, military activities, etc., is not whether they will be modified, but whether the risk they pose rises to the level of creating a need for special management considerations or protections for physical or biological features essential to the conservation of the species. In that regard, the record of section 7 consultations by NMFS in Hawaii should provide a rich body of scientific

information to support identifying the potential need for management considerations or protections rather than speculating about future actions.

**Referenced Text:** This is not an exhaustive or complete list of potential effects, rather a description of the primary concerns and potential effects that we are aware of at this time and that should be considered in accordance with Section 7 of the ESA when Federal agencies authorize, fund, or carry out these activities.

**Reviewer 2 Comment:** The risks identified in the paragraphs below need not be exhaustive, but they should be supported by “the best available scientific information.” There are scientific papers, tech reports, biological opinions and other sources of information that should be located and cited to support the concerns identified here.

**Response:** The documents listed prior to the various activities are summary documents which cite the papers, reports, etc. listed throughout this section.

**Referenced Text:** Large-scale permanent activities are more likely to interrupt these whales’ ability to move throughout island-associated habitat and may reduce the availability or access to high-use or other island-associated habitats.

**Reviewer 2 Comment:** Referring to “Large-scale permanent activities,” - This is vague. Are there examples of such activities that have been considered or proposed in the past.

**Response:** An example, large in-water construction projects, is now provided.

**Referenced Text:** Noise - These whales rely on their ability to produce, receive, and interpret sound within their environment to navigate, communicate, and detect predators and prey. The introduction of chronic noise within their habitat can mask - or alter these animals’ ability to detect or interpret - important acoustic cues that support life history functions such as foraging, reproduction, socialization, travel, and predator avoidance.

**Reviewer 2 Suggested Edits:** Add - *This is particularly important given the dispersed nature of false killer whale groups (Baird et al. 2008; Bradford et al. 2013) and the importance of sound in coordinating activities.*

**Response:** Revisions accepted.

**Referenced Text:** These measures are determined during the Section 7 consultation process and are project specific. Modifications of such projects would likely vary from project to project depending on such factors as location, the scope or extent of the project, number and type of essential features potentially affected, or project duration.

Activities with no federal nexus are not subject to the Section 7 consultation, and therefore, are not subject to project modifications that might result from Section 7 consultation. These include a variety of other activities that may occur in waters under consideration for MHI IFKW critical habitat (between the 45 and 3200-m depth contours) including common recreational activities such as boating, state-regulated fishing, or diving. NMFS places no additional prohibitions or restrictions on areas as a result of designating areas as critical habitat; however, nonfederal entities may use information from this critical habitat designation to protect and conserve the features that support MHI IFKW habitat.

**Reviewer 2 Comment:** This general discussion of section 7 and its limitations seems out of place here. It should be in the introductory section of this document.

**Response:** We agree and have moved this discussion to the beginning of this section.

## In-Water Construction

**Referenced Text:** This category consists of a broad range of activities associated with construction and development in marine habitats and may include any of these activities that would affect preferred island-associated marine habitat, prey species, water quality or the sound within that habitat.

**Reviewer 2 Comment:** What is it about these activities that may need special management consideration. What is there scientific information used to determine that these activities present a need for special management considerations. This text contains conclusory statements or leaves the reader to make the connections. There is a wealth of information in past environmental impact statements and biological opinions that could be referenced to demonstrate the risk these activities present such that the physical and biological features may be in need of special management consideration or protection. There is also an abundance of literature on effects of these activities if not it Hawaii, in other areas and for other delphinids that could be used to rationalize the specter for concern (i.e. special management considerations).

**Response:** This is a generalized discussion of impacts related to construction, as specific impacts are discussed (e.g., impacts related to dredging) the associated scientific literature is included. Where possible, we have updated this information throughout this section.

**Referenced Text:** It is expected that only large-scale in-water construction projects would have the potential to alter the quantity, quality, and availability of MHI IFKW critical habitat such that additional project modifications may be identified during Section 7 consultation to reduce potential adverse effects to essential features.

**Reviewer 2 Comment:** By whom and why? What's the best available science that supports this statement.

**Response:** We revised this sentence to note that these projects “could” result in such impacts. Later in the paragraph we provide citations for the types of impacts related to structures acting as fish aggregating devices and direct the reader to the “Energy Development” section for more specific examples of structures and related impacts.

## Energy Development

**Referenced Text:** Energy development activities are akin to in-water construction activities; however, beyond the placement of a structure in the marine environment, operations of such projects may include the emission of electromagnetic fields and underwater sound into the marine environment (Thomsen et al. 2015).

**Reviewer 3 Comments:** Related to electromagnetic fields - Is there any indication that FKWs are sensitive to electromagnetic fields? I know of none. Related to underwater sound - Most of these sounds are low frequency. Suggest reading and citing Au et al 1997 for pseudorca hearing thresholds of low frequency sounds.

**Response:** Electromagnetic fields are discussed in context to how this stressor may affect the prey feature for this designation. As noted in the report, there is insufficient information to suggest that MHI IFKW prey may be adversely effected. With regard to the low-frequency sound impacts, we have included Au et al. 1997 in the Vocalization, Hearing, and Underwater Sound section of the report and refer the reader back to this reference in our example for wind-energy that is known to emit low frequency sounds.

**Referenced Text:** The *Report to Congress on the Potential Environmental Effects of Marine and Hydrokinetic Energy Technologies* identifies projects and studies where impacts, such as those described above, have been acknowledged, and identifies project location as playing the biggest role in minimizing potential environmental effects (Department of Energy 2009).

**Reviewer 2 Comment:** Citation should go here – referring to the report’s name.

**Response:** Revision made.

**Referenced Text:** At this time, there is insufficient information to suggest that modifications may be necessary to protect MHI IFKW prey species, which are primarily pelagic in nature.

**Reviewer 2 Comment and suggested edit:** Bonefish and some of the jacks are not pelagic – add “primarily” before pelagic.

**Response:** Revision accepted.

### Activities that Contribute to Water Pollution

**Referenced Text:** General water quality standards within the State of Hawaii require that permitted effluent does not cause degradation to local waterways and resources.

**Reviewer 2 Comment:** It would be worth noting the potential for introduction of pathogens through some of the effluent sources on Maui, see e.g., Dailer, Knox, Smith, Napier and Smith 2010 Marine Pollution Bulletin, Glenn et al. 2013 Lahaina groundwater tracer study – Lahaina, Maui, Hawaii. Report to State of Hawaii Department of Health and US EPA.

**Response:** Additional information about this threat was added to the previous paragraph, which discusses nonpoint source pollution.

**Referenced Text:** At this time, NMFS currently has insufficient information to predict, what if any, project modifications may be necessary to address potential impacts to MHI IFKW essential features.

**Reviewer 2 Comment:** So the point of these specific subject area discussions seems to be to address the “and which may require species management considerations or protections” element of the definition of “critical habitat.” NMFS does not have to predict what project specific modifications may be necessary or are likely to be imposed in this document. Pointing out that some activities are regulated under adequate regulatory or management programs is probably useful information for the public, but the relevance here is whether a physical or biological feature may require special management considerations or protection. I would suggest reorganizing these sections along these lines.

- A. Identify a risk,
- B. discuss the science characterizing how the risk may affect the relevant physical or biological feature,
- C. discuss the regulatory framework under which each risk is managed,
- D. identify gaps in the framework, if any, and
- E. conclude whether special management considerations or protections may be needed for that particular physical or biological feature.

**Response:** With the exception of discussing the gaps in the regulatory framework, we find that this section provides the information suggested, but have not reorganized the report to include the full framework suggested. The statute only requires that we make a determination on whether the features may require special management considerations or protections, not whether there are gaps in existing protections. However, existing regulatory or management programs are examined more closely under the draft economic report and the draft 4(b)(2)

report, as this information is relevant in determining the incremental impacts of the designation.

### **Aquaculture/Mariculture**

**Referenced Text:** Aquaculture and mariculture (cultivation of marine organisms) activities include impacts similar to both in-water construction and to activities that affect water quality.

**Reviewer 1 Comment:** There is also the potential to introduce diseased fish into the wild and to create opportunities for depredation of penned fish which could result in increased interactions with humans.

**Response:** This risk is identified by the following text: “Water quality or prey resources may be affected by waste disposal, the introduction of exotic species or pathogens, or release of pesticides or antibiotics.”

**Referenced Text:** NMFS Pacific Islands Regional Office (PIRO) is preparing a programmatic environmental impact statement to analyze potential environmental, social, and economic impacts associated with the proposed aquaculture management program ([NOAA Fisheries 2017](#)).

**Reviewer 2 Comment:** Referring to NOAA Fisheries 2017 - Not in references.

**Response:** The hyperlink to this website was added.

**Referenced Text:** There is still potential for additional aquaculture facilities to be developed within MHI IFKW critical habitat. NMFS has a marine aquaculture strategic plan for 2016-2020 that establishes a target of expanding sustainable U.S. marine aquaculture production by at least 50 percent by the year 2020 (NOAA 2015).

**Reviewer 2 Comment:** Listed as NMFS 2015 in the references.

**Response:** This has been corrected in the List of References.

### **Fisheries**

**Referenced Text:** However, they are also known to prey on reef associated species, including bonefish, scrawled file fish, and threadfin jack (Baird 2009, Oleson et al. 2010, Table 2).

**Reviewer 1 Suggested Edits:** add bonefish to reef species and reference Table 2.

**Response:** Revised as suggested.

**Referenced Text:** This resulted in an effective closure of these fisheries in most of the MHI IFKWs’ range, though some exceptions applied for small vessels (50 CFR Part 665, Subpart F, §665.807) and certain areas were opened seasonally in 1992 (October – January) (57 FR 7661, March 1992).

**Reviewer 1 Suggested Edits:** Remove dates from () and add “from October through January.

**Response:** Revised as suggested.

**Referenced Text:** Consequently, the deep-set and shallow-set longline fisheries do not directly remove prey from areas under consideration for critical habitat.

**Reviewer 1 Comment:** While they aren’t in the areas under consideration for critical habitat at the time of removal, given that they are pelagic fish, they are removing fish from the same

widespread population. Note that the next sentence also contradicts this statement – if foreign fishing vessels fishing outside the EEZ are indirectly contributing to long-term reduction of prey species then the U.S. longline.

**Response:** Revisions have been made to help clarify that these activities do not harvest within the boundaries of the areas under consideration for designation, but may remove fish that move in and out of this boundary.

**Referenced Text:** However, for the purpose of ESA Section 7, NMFS consults on federally-managed U.S. domestic fisheries.

**Reviewer 2 Comment:** The limits of the section 7 consultation process are not a consideration identified in section 3(5) of the ESA. I think the discussion of may happen in future consultations could be removed from this document as they are not relevant to the decision-making process. Past biological opinions could be included more extensively in the document as they contain information to add to the body of best available scientific information upon which this system should be based.

**Response:** We have left this sentence in because we believe noting how prey stocks may be influenced by other fisheries and which fisheries are subject to Section 7 consultation is important for the public to understand. In preparation for this report we relied on stock information that is more current than the information used in the previous biological opinion. This information is included and referenced throughout the section.

**Referenced Text:** Further, it is unclear whether important prey species may be island-associated prey types or to what degree this DPS relies on fish stocks that move through the range of these whales and the action area of the fisheries.

**Reviewer 1 Comment:** Given the long list of prey species it seems like much of this should be known?

**Response:** This sentence was meant to identify the difficulty of knowing whether this DPS may rely more heavily on fish that could be concentrated in a smaller area than used by the fishery as a whole. After review we recognize that the sentence is not necessary to convey information that is known about the stocks and we have removed the sentence to avoid further confusion.

**Referenced Text:** The few coral reef species that have been observed in the diet of insular false killer whales (Baird, 2009) include scrawled filefish (*Aluterus scriptus*) and threadfin jack (*Alectis ciliaris*), and unknown species of jack (West 2016).

**Reviewer 1 suggested edit:** add bonefish into the list of reef fish.

**Response:** Revised as suggested.

### **Military Activities**

**Referenced Text:** In combination, research and training for military preparedness may include activities that have the potential to affect island-associated habitat, water quality, prey availability, or the quality of noise within these habitats depending on the type of activity taking place and the location of the activity.

**Reviewer 2 Comment:** Not just quality but amount or intensity.  
**Response:** Revised to include the “quantity” and quality of noise.

**Referenced Text:** For example, for sonar-related activities the consultation includes the potential for these activities to result in behavioral, acoustic, and physiological effects on listed species such as IFKWs.

**Reviewer 2 Comment:** But the issue here is the effect of these activities on the habitat. Do these activities create conditions such that the physical and biological features may require special management considerations or protections? Look to this history of biological opinions for information on the potential effects to the physical and biological features.

**Response:** This sentence is provided to provide background about the Navy’s existing Section 7 consultation process. Discussions about the habitat analysis portion is provided below. We will be working to further clarify whether this is an essential feature of this designation and how sound as a feature of habitat may be impacted by these activities. Additional information is solicited in the proposed rule.

## CRITICAL HABITAT REVIEW TEAM

### CHRT Phase 1

**Reviewer 2 Comment:** I find discerning the rationale for selecting marine habitat between 45 meters and 3200 meters deep around the Main Hawaiian Islands difficult. While there are several published reports and journal articles reference to support designation of this area, none of them appears to analyze distribution of habitat in increments of less than 100 meters. For example, Bradford et al. (2015) doesn't define depth criteria for MHI IFKH habitat and Baird et al. (2012) presents depth data, but only in increments of 100 meters. Further in Baird et al. (2012) only about 2.5% of the high density cells are less than 100 m deep and the deepest high-density cells are less than 18, 00 m deep. Low-density cells are more evenly distributed across a broader range of depths down to 4900 meters. About 10% of the low-density cells are less than 100 m and approximately 20o/o of the low-density cells are deeper than 3200 m. On page 21 of the report, the authors equate the term "high- density areas" from Baird et al. (2012) with a new term "high-use areas," and then proceed to discuss the high-use areas through the remainder of the report as the areas important for conservation. So, what is the rationale and scientific information that supports an inner boundary depth of 45 meters? If high-use areas are the driver, what is the rationale for extending the outer boundary beyond 1700 meters deep. Or conversely, if the intent is to include low-use areas, what is the rationale for truncating the outer boundary depth at 3200 meters. The rationale for selecting the depth criteria appear to be based on consideration of ". . .new data from tagging and tracking studies by Cascadia Research Collective ..." (Page 27 of the report). If that's the case and those data and analyses are not published then they should be presented in this report and discussed in sufficient detail that the decision-making process is apparent to the reader, appropriate graphs and charts would be helpful.

**Response:** Where possible we have enhanced our discussion of the selection of these boundaries. As noted in this section of the report, the CHRT identified that island-associated habitat essential to the conservation of this DPS must contain more than the currently recognized high-use areas and that this habitat must allow for movement around and between the Islands to support this population’s ability to successfully forage, socialize, and reproduce. Although the CHRT reviewed information available in the scientific literature

noted by this reviewer, the depth boundaries were not selected using a single source of data but rather a combination of information in the literature and review of available satellite-tagging information. The depth selected for the inner boundary includes those areas where habitat use becomes more consistent. As noted in the report, the team explored several depth options to identify the outer extent of critical habitat for this DPS, guided mostly by the need to include island-associated habitat essential to conservation for this DPS. Factors that were discussed included ensuring that the depth selected included all of the recognized high-use areas, island-associated habitat around each Island of the chain, and habitat that allows for movement between these areas. The outer boundary of 3200-m depth contour was selected to ensure that all these criteria were met. This full range of depths from 45 m to 3200 m incorporates a majority of the tracking locations of MHI IFKWs. For clarity we note that Baird *et al.* (2012) uses the terminology “high-density” and “high-use” areas interchangeably in their publication and that this was not a term created for the draft biological report.

**Referenced Text:** To be eligible for designation as critical habitat under the ESA’s definition of occupied areas, each specific area must contain at least one essential feature that may require special management considerations or protection.

**Reviewer 2 Suggested Edits:** Replace “essential feature that,” with “physical or biological feature essential for the conservation of the species and which.”

**Response:** Revised as suggested.

**Referenced Text:** Specifically, histograms of the depth associated with tracking locations were reviewed.

**Reviewer 2 Comment:** referring to the histograms - These should be presented in this report since they don’t appear to be available in the referenced literature.

**Response:** This sentence was removed, because upon further review of the CHRT’s deliberations, the number of locations at various depths were reviewed in a table format rather than as a histogram. The boundary was selected taking into consideration scientific literature (Baird et al. 2010) that describes the population’s use of waters just offshore and the CHRT’s review of satellite tag locations at various depths.

## LIST OF REFERENCES

**Reviewer 2 Comments:** Some of these are not cited in the document. Are highlighted. Also the Convention for sighting federal agencies should be consistent, i.e. U.S. Department of Agriculture and U.S. Department of Defense. And at the agency level. National Marine Fisheries Service, NMFS or NOAA fisheries. Just be consistent. Cummings and Fish (1971) is sighted once in the document. If both of these are intended to be cited the text should be modified and these should be cited as 1971(a) and 1971(b).

**Response:** We have reviewed the references cited throughout the report and removed references that were no longer referenced in the text, as identified by this reviewer. In addition we have updated reference information to be more consistent and removed the additional Cummings and Fish reference that does not apply.

**Referenced Text:** Baird, R. W. (2009). [A review of false killer whales in Hawaiian waters: biology, status, and risk factors](#), Cascadia Research Collective Olympia.



**Reviewer 1 Comments and Suggested Edits:** This is a contract report for the MMC. Remove CCR Olympia and replace with Marine Mammal Commission.

**Response:** Revised as suggested.

**Referenced Text:** Baird, R. W., M. Hanson, et al. (2012). Range and primary habitats of Hawaiian insular false killer whales: informing determination of critical habitat, DTIC Document.

Baird, R. W., D. Cholewiak, et al. (2015). "5. Biologically Important Areas for Cetaceans Within US Waters-Hawai'i Region." Aquatic Mammals **41**(1): 54.

Baird, R. W., G. S. Schorr, et al. (2010). Movements and habitat use of satellite-tagged false killer whales around the main Hawaiian Islands, DTIC Document.

**Reviewer 1 Suggested Edits:** Replace DTIC Document with Endangered Species Research  
**Response:** Revised as suggested.

**Reviewer 2 Comment:** Referring to both studies noted - For this assessment, grid cells with density of locations greater than 1 SD above the mean are considered high-use areas and mapped accordingly to identify the BIA (Figure 5.7). Is this difference in definition of "high density area" relevant?

**Response:** The difference between the studies has been explained in the Movement and Habitat Use section of the report.

**Referenced Text:** Photopoulou, T., I. M. Ferreira, et al. (2016). "Evidence for a postreproductive phase in female false killer whales *Pseudorca crassidens*." arXiv preprint arXiv:1606.04519.

**Reviewer 1 Comment:** This has now been published in *Frontiers in Zoology* (2017, 14:30), better to cite the published version.

**Reviewer 2 Comment:** Should this be 2017?

**Response:** This has been revised as suggested by Reviewer 1.

**Referenced Text:** Stacey, P. J., R. W. Baird, et al. (1994). *Pseudorca crassidens*, Soc.

**Reviewer 1 Comment:** Replace ", Soc" with "Mammalian Species."

**Response:** Revised as suggested.