intend to continue engaging in informal and formal contacts with the U.S. State Department, giving careful consideration to all written and oral comments received.

List of Subjects in 50 CFR Part 223

Endangered and threatened species, Exports, Imports, Transportation.

Dated: September 12, 2016.

Samuel D. Rauch, III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

For the reasons set out in the preamble, we propose to amend 50 CFR part 223 as follows:

PART 223—THREATENED MARINE AND ANADROMOUS SPECIES

■ 1. The authority citation for part 223 continues to read as follows:

Authority: 16 U.S.C. 1531–1543; subpart B, § 223.201–202 also issued under 16 U.S.C. 1361 *et seq.;* 16 U.S.C. 5503(d) for § 223.206(d)(9).

■ 2. In § 223.102, paragraph (e), add entries for two species in alphabetical order by common name under the ''Fishes'' table subheading to read as follows:

§ 223.102 Enumeration of threatened marine and anadromous species.

* * * * *

(e) * * *

Species [1]			Citation(s) for listing determination(s)	Critical habitat	ESA Rules
Common name	Scientific name	Description of listed entity			
*	*	*	*	*	*
FISHES					
*	*	*	*	*	*
Guitarfish, blackchin	*Rhinobatos cemiculus.*	Entire species	[**Federal Register** citation and date when published as a final rule].	NA	NA
Guitarfish, common ..	*Rhinobatos rhinobatos.*	Entire species	[**Federal Register** citation and date when published as a final rule].	NA	NA
*	*	*	*	*	*

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

* * * * *

[FR Doc. 2016–22450 Filed 9–16–16; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 160614520–6520–01]

RIN 0648–XE686

Endangered and Threatened Wildlife and Plants: Proposed Rule To List the Maui's Dolphin as Endangered and the South Island Hector's Dolphin as Threatened Under the Endangered Species Act

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Proposed rule; request for comments.

SUMMARY: We, NMFS, propose to list the Maui's dolphin (*Cephalorhynchus hectori maui*) as endangered and the South Island Hector's dolphin (*C. hectori hectori*) as threatened under the Endangered Species Act (ESA). We have reviewed the best available scientific and commercial data and completed a comprehensive status review for these two subspecies of Hector's dolphin (*C. hectori*). The Maui's dolphin faces serious demographic risks due to critically low abundance, a low population growth rate, a restricted range, low genetic diversity, and ongoing threats such as bycatch in commercial and recreational gillnets. We have determined Maui's dolphin is currently in danger of extinction throughout its range and, therefore, meets the definition of an endangered species. The relatively more abundant and more widely distributed South Island Hector's dolphin has experienced large historical declines and is expected to continue to slowly decline due to bycatch and other lesser threats, such as disease and impacts associated with tourism. We have determined that this subspecies is not currently in danger of extinction throughout all or a significant portion of its range, but is likely to become so within the foreseeable future; and therefore, it meets the definition of a threatened species. Both subspecies occur only in New Zealand. We are authorized to designate critical habitat within U.S. jurisdiction only, and we are not aware of any areas within U.S jurisdiction that may meet the definition of critical habitat under the ESA. Therefore, we are not proposing to designate critical habitat. We are soliciting public comments on our status review report and proposal to list these two subspecies.

DATES: Comments on this proposed rule must be received by November 18, 2016. Public hearing requests must be made by November 3, 2016.

ADDRESSES: You may submit comments on this document, identified by NOAA–NMFS–2016–0118, by either of the following methods:

- *Electronic Submissions:* Submit all electronic comments via the Federal eRulemaking Portal. Go to *www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2016-0118,* click the ''Comment Now!'' icon, complete the required fields, and enter or attach your comments.
- *Mail:* Submit written comments to Lisa Manning, NMFS Office of Protected Resources (F/PR3), 1315 East West Highway, Silver Spring, MD 20910, USA.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov*

without change. All personal identifying information (*e.g.,* name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous).

You can find the petition, status review report, **Federal Register** notices, and the list of references electronically on our Web site at *http://www.nmfs.noaa.gov/pr/species/petition81.htm.*

FOR FURTHER INFORMATION CONTACT: Lisa Manning, NMFS, Office of Protected Resources, *lisa.manning@noaa.gov,* (301) 427–8466.

SUPPLEMENTARY INFORMATION:

Background

On July 15, 2013, we received a petition from WildEarth Guardians to list 81 marine species or populations as endangered or threatened species under the ESA. We determined that the petition had sufficient merit for further consideration, and status reviews were initiated for 27 of the 81 species or populations, including the Hector's dolphin (*Cephalorhynchus hectori;* 78 FR 63941, October 25, 2013; 78 FR 66675, November 6, 2013; 78 FR 69376, November 19, 2013; 79 FR 9880, February 21, 2014; and 79 FR 10104, February 24, 2014). This document addresses the proposed determination for the Hector's dolphin. The findings and relevant **Federal Register** notices for the other species and populations can be found on our Web site at *http://www.nmfs.noaa.gov/pr/species/petition81.htm.*

Listing Determinations Under the ESA

We are responsible for determining whether species are threatened or endangered under the ESA (16 U.S.C. 1531 *et seq.*). To make this determination, we first consider whether a group of organisms constitutes a ''species'' under the ESA, then whether the status of the species qualifies it for listing as either threatened or endangered. Section 3 of the ESA defines a ''species'' to include ''any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.'' Maui's dolphin, *C. hectori maui,* and the South Island (SI) Hector's dolphin, *C. hectori hectori,* have been formally recognized as subspecies (Baker et al. 2002, Pichler 2002); and thus, each meets the ESA definition of a ''species.''

Section 3 of the ESA defines an endangered species as ''any species which is in danger of extinction throughout all or a significant portion of its range'' and a threatened species as one ''which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' We interpret an ''endangered species'' to be one that is presently in danger of extinction. A ''threatened species,'' on the other hand, is not presently in danger of extinction, but is likely to become so in the foreseeable future (that is, at a later time). In other words, the primary statutory difference between a threatened species and endangered species is the timing of when a species may be in danger of extinction, either presently (endangered) or in the foreseeable future (threatened).

When we consider whether a species might qualify as threatened under the ESA, we must consider the meaning of the term ''foreseeable future.'' It is appropriate to interpret ''foreseeable future'' as the horizon over which predictions about the conservation status of the species can be reasonably relied upon. The foreseeable future considers the life history of the species, habitat characteristics, availability of data, particular threats, ability to predict threats, and the reliability to forecast the effects of these threats and future events on the status of the species under consideration. Because a species may be susceptible to a variety of threats for which different data are available regarding the species' response to that threat, or which operate across different time scales, the foreseeable future is not necessarily reducible to a particular number of years.

Section 4(a)(1) of the ESA requires us to determine whether any species is endangered or threatened due to any one or a combination of the following five threat factors: The present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence. We are also required to make listing determinations based solely on the best scientific and commercial data available, after conducting a review of the species' status and after taking into account efforts being made by any state or foreign nation to protect the species.

In assessing the extinction risk of these two subspecies, we considered demographic risk factors, such as those developed by McElhany et al. (2000), to organize and evaluate the forms of risks. The approach of considering demographic risk factors to help frame the consideration of extinction risk has been used in many of our previous status reviews (see *http://www.nmfs.noaa.gov/pr/species* for links to these reviews). In this approach, the collective condition of individual populations is considered at the species level (or in this case, the subspecies level) according to four demographic viability factors: Abundance and trends, population growth rate or productivity, spatial structure and connectivity, and genetic diversity. These viability factors reflect concepts that are well-founded in conservation biology and that individually and collectively provide strong indicators of extinction risk.

Scientific conclusions about the overall risk of extinction faced by Maui's dolphin and the SI Hector's dolphin under present conditions and in the foreseeable future are based on our evaluation of the subspecies' demographic risks and section 4(a)(1) threat factors. Our assessment of overall extinction risk considered the likelihood and contribution of each particular factor, synergies among contributing factors, and the cumulative impact of all demographic risks and threats on each subspecies.

Section 4(b)(1)(A) of the ESA requires the Secretary, when making a listing determination for a species, to take into consideration those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect the species. Therefore, prior to making a listing determination, we also assess such protective efforts to determine if they are adequate to mitigate the existing threats.

Status Review

Status reviews for Maui's dolphin and the SI Hector's dolphin were completed by NMFS staff from the Office of Protected Resources. To complete the status reviews, we compiled the best available data and information on the subspecies' biology, ecology, life history, threats, and conservation status by examining the petition and cited references, and by conducting a comprehensive literature search and review. We also considered information submitted to us in response to our petition finding. A single draft status review report was prepared for the two subspecies and submitted to three independent peer reviewers; comments and information received from peer reviewers were addressed and incorporated as appropriate into the draft report. The draft status review

report (cited as Manning and Grantz 2016) is available on our Web site (see **ADDRESSES** section). In the sections below, we provide information from the report regarding threats to and the status of each subspecies.

Subspecies Descriptions

The Hector's dolphin is one of the world's smallest dolphins and occurs only in the coastal waters of New Zealand. Hector's dolphins have short and stocky bodies, no external beak, and a relatively large fluke. They are easily distinguished by their distinctive black, white, and gray color patterns and their rounded dorsal fin, which has a shallowly sloping anterior edge and a convex posterior edge, and is unique to the genus (Dawson 2009). Lifespan is thought to be about 20 years (Slooten 1991, Secchi et al. 2004b), and several dolphins have been aged to a minimum of 22 years based on photo-identification data (Rayment et al. 2009a, Webster et al. 2009). Hector's dolphins have a varied diet that includes cephalopods, crustaceans, and small fish species; however, relatively few prey species appear to comprise the bulk of their diet. Stomach content analysis indicates that common prey species include red cod (*Pseudophycis bachus*), ahuru (*Auchenoceros punctatus*), arrow squid (*Nototodarus* sp.), sprat (*Sprattus* sp.), sole (*Peltorhamphus* sp.), and stargazer (*Crapatalus* sp., Miller et al. 2013).

Females typically have their first calf at 7–9 years of age, and males likely reach sexual maturity at 6–9 years of age (Slooten 1991, Gormley 2009). Calving occurs in the austral spring and early summer, generally from November to February (Slooten and Dawson 1988, Slooten and Dawson 1994). Calves remain with their mothers for 1 to 2 years, although 2 years appears to be more common (Slooten and Dawson 1994). Females typically produce single calves every 2 to 4 years (Slooten and Dawson 1994), which gives a yearly birth rate between 0.33 and 0.5. Fecundity (*i.e.,* the number of female offspring per female per breeding season) has been estimated as ranging from 0.165 to 0.250 (Secchi et al. 2004b, Gormley 2009).

Hector's dolphins make few audible sounds, and their repertoire consists mainly of high frequency (112–130k Hz) clicks of either one or two short pulses (*i.e.,* usually less than 200 µs for single pulses and less than 400 µs for double pulses, Dawson 1988a). Analyses of recorded vocalizations suggest Hector's dolphins use their vocalizations for fine discrimination, locating prey, and communicating, rather than large-scale navigation, for which lower frequency echolocation is required (Dawson 1988a, Dawson 1991a).

Available data indicates that Hector's dolphins have small home ranges and high site fidelity (Bedjer and Dawson 2001, Bräger et al. 2002, Rayment et al. 2009a, Oremus et al. 2012). Based on multiple analyses of photo-identification data and genetic recapture data, the along-shore home range appears to be similar for both subspecies and is typically less than 50 km (Bräger et al. 2002, Rayment et al. 2009a, Oremus et al. 2012). Home ranges also do not appear to differ between males and females (Bräger et al. 2002, Rayment et al. 2009a).

Historically, Hector's dolphins are thought to have been present along almost the entire coastlines of both the North and South Islands of New Zealand (Cawthorn 1988, Russell 1999, Pichler 2002, MFish and DOC 2007a). The two subspecies probably became initially separated by the opening of Cook Strait during the late Pleistocene and Holocene interglacial periods, and this isolation was likely maintained through behavioral mechanisms such as natal philopatry and small home ranges (Pichler 2002, Baker et al., 2002, Dawson 2009). Currently, Maui's dolphins occur along the northwest coast of the North Island, between Maunganui Bluff in the north and Whanganui in the south (Currey et al. 2012). Occasional sightings and strandings have also been reported from areas farther south along the west coast as well as in areas such as Hawke Bay on the east coast of the North Island (Baker 1978, Russell 1999, Ferreira and Roberts 2003, Slooten et al. 2005, MFish and DOC 2007a, Du Fresne 2010). The SI Hector's dolphin currently has a fragmented distribution around the South Island (Dawson et al. 2004, Rayment et al. 2011b) and consists of at least three genetically distinct, regional populations (Pichler 2001, Pichler 2002, Hamner et al. 2012a). SI Hector's dolphins are most abundant around Banks Peninsula, Cloudy Bay, and Cliffords Bay on the east coast and along the central west coast. Distinct and localized populations also occur on the south coast in Te Waewae Bay, Toetoe Bay, and Porpoise Bay (Dawson and Slooten 1988b, Clement et al. 2011, Hamner et al. 2012a, Rodda 2014, Mackenzie and Clement 2014). The connectivity between these regional populations, especially the south coast populations, appears to be limited (Bejder and Dawson 2001, Hamner et al. 2012a). Hector's dolphins do not appear to occur offshore of or within the deep water fiords of Fiordland, although they have been sighted there on rare occasions (Dawson and Slooten 1988b, MFish and DOC 2007a).

Hector's dolphins are typically sighted within about 20 nautical miles (nmi; 37.0 km) of the shore and in water less than 100 m deep (Slooten et al. 2005, Mackenzie and Clement 2014, Rayment et al. 2011b, Mackenzie and Clement 2016). For the North Island, an extensive review by Du Fresne (2010) of both published scientific surveys and unpublished opportunistic sightings data indicates that Maui's dolphins are most frequently found within 4 nmi (7.4 km) of the coast but do occasionally occur at least as far as 7 nmi (13.0 km) offshore. Off the South Island, differences in distribution patterns have been observed for the west and east coasts that may be driven in part by differences in bathymetry or location of the shelf break. On the west coast, the 100 m isobath is always within 13 nmi (24.1 km) of the coast, and in some places as close as 5 nmi (9.3 km); whereas, off Banks Peninsula on the east coast, the 100 m isobath is 16 to 30 nmi (29.6 to 55.6 km) offshore (Rayment et al. 2011b). SI Hector's dolphins are typically within 8 nmi (14.8 km) from shore on the east coast of the South Island and within 3 nmi (5.6 km) from shore on the west coast (Rayment et al. 2010b, 2011b, Mackenzie and Clement 2013, Mackenzie and Clement 2016). However, SI Hector's dolphins have been sighted at least occasionally as far as about 20 nmi (37.0 km) from shore on both coasts (Rayment et al. 2010b, 2011b, MacKenzie and Clement 2016).

Seasonal changes in this nearshore distribution are evident for at least some populations of Hector's dolphins, with distributions often extending farther from shore in the winter relative to the warmer months. For example, based on aerial surveys that extended as far as 20 nmi offshore (37.0 km) of Banks Peninsula and were conducted over 3 years (2002, 2004, and 2005), Rayment et al. (2010b) found that winter sightings extended as far as 18.2 nmi (33.6 km) offshore, compared to 16.3 nmi (30.2 km) in summer; and, while only 7 percent of all dolphins were sighted beyond the 50 m isobath in summer, 44 percent of all dolphins were sighted beyond the 50 m isobath in winter. Slooten et al. (2005) report a similar change in distribution for Maui's dolphins between summer and winter aerial surveys conducted in 2004/2005. Similar seasonal changes in SI Hector's dolphin distribution relative to shore and water depth have also been detected in comparisons of summer and winter sightings data for the west coast of the South Island; however, the observed

seasonal shift on the west coast is less dramatic relative to that on the east coast (Rayment et al. 2011b, Mackenzie and Clement 2014).

Summary of ESA Section 4(a)(1) Factors Affecting Maui's Dolphin

Available information regarding historical, current, and potential threats to Maui's dolphins was thoroughly reviewed and is discussed in detail in the status review report (Manning and Grantz 2016). We summarize information regarding these threats below according to the factors specified in section 4(a)(1) of the ESA.

In August 2007, the New Zealand Department of Conservation (DOC) and the Ministry for Primary Industries (MPI, formerly called the Ministry of Fisheries or MFish) released a draft Threat Management Plan (TMP) for Hector's dolphins. This plan describes the nature and level of actual and potential threats to Maui's dolphins, as well as strategies to address those threats. In addition, in June 2012, DOC and MPI convened a risk assessment workshop to inform their review of the Maui's dolphin portion of the TMP. The results of this semi-quantitative risk assessment are available in the report by Currey et al. (2012). The report identifies, evaluates, and rates threats to Maui's dolphins based on scoring by an expert panel. Both the TMP and the risk assessment report greatly informed our assessment, as summarized below.

The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Threats to the habitat of Maui's dolphins include pollution, mining, oil and gas development activities, acoustic disturbance (Currey et al. 2012).

Persistent chemical pollutants are a concern for many cetacean species, which theoretically can accumulate high concentrations of contaminants due to their longevity, high trophic-level, and naturally high blubber content (Stockin et al. 2010). Contaminants are also specifically a concern for Hector's dolphins due to the dolphins' coastal distribution and thus close proximity to agricultural and industrial activities. Toxicological studies of contaminants, such as polychlorinated biphenyls (PCBs) and organochlorine (OC) pesticides, are limited for Maui's dolphins, and studies on emerging contaminants, such as brominated flame retardant (PBDEs) and perfluorinated chemicals, have yet to be done. Numerous studies on other cetacean species have linked contaminants, such as heavy metals, PCBs, and OC pesticides, with biological impacts, including endocrine disruption, reproductive impairment, immune suppression, and elevated infectious disease (*e.g.,* Fujise et al. 1988, Kuiken et al. 1994, Jepson et al. 2005, O'Hara and O'Shea 2001, Schwacke et al. 2002, Wells et al. 2005). Stockin et al. (2010) examined PCB and OC contaminant loads in stranded or entangled Hector's dolphins (n=27, SI Hector's dolphins; n=3, Maui's dolphins) sampled from 1997 to 2009. Results indicated high concentrations of these chemicals in both subspecies, and a roughly two-fold increase in levels of OC pesticides than had been previously reported for Hector's dolphins by Jones et al. (1999). However, as noted by Stockin et al. (2010), no PCB concentrations were above thresholds associated with reproductive and immunological effects (Stockin et al. 2010).

Pollution in the form of plastic marine debris from both marine and land-based sources can accumulate in, and degrade, Maui's dolphins' habitat. Plastics and other synthetic, non-biodegradable materials in the marine environment create the potential for entanglement, injury, and ingestion. Although data are lacking to evaluate whether and the extent to which this threat is impacting Maui's dolphins, Currey et al. (2012) did identify plastics as being likely to affect population trends over the next 5 years. Plastic bags have been identified as a concern in particular, because they may be mistaken for squid, a common prey item for Maui's dolphins.

Interest in marine minerals mining along the North Island of New Zealand has been growing in recent years, with prospecting and exploration occurring mainly from Manukua Harbor south to New Plymouth (Thompson 2012). Exploration activities have mainly targeted iron sands or titanomagnetite (Thompson 2012). According to New Zealand Petroleum and Minerals (NZPM), which is the government agency responsible for issuing mining permits for New Zealand's oil, gas and mineral resources, demand and exploration for petroleum (oil and gas) is also increasing, and multiple areas within the range of Maui's dolphins are covered under existing prospecting, exploration, and mining permits. Mineral mining activities involving the large scale removal of sediment from the seabed are likely to lead to relatively long term (3–10 year) changes to benthic community composition, thereby altering prey availability and benthic topography (Thompson 2012). Other potential, unintended side-effects include the mobilization and accidental spilling of contaminants and exposure to greater levels of vessel traffic (Thompson 2012). Acoustic disturbance, such as from seismic surveys, sonar, and drilling activities, also poses a potential threat to Maui's dolphins, because it may have negative physical or physiological effects, such as shifts in hearing thresholds, and may disrupt normal behaviors, including navigating, migrating, and feeding (Gordon et al. 2003; Thompson 2012).

The extent to which Maui's dolphins are currently being impacted by these and other habitat-related threats is assumed to be small. These threats have been characterized as having mainly sub-lethal effects, and combined, may currently be responsible for less than 4.5 percent of all Maui's dolphin mortalities (Currey et al. 2012). However, it is probable that Maui's dolphin habitat will become increasingly degraded as a result of pollution and acoustic and benthic disturbances due to increasing human pressure and demand for mineral and petroleum resources (MFish and DOC 2007b).

Overutilization for Commercial, Recreational, Scientific or Educational Purposes

Overutilization of Maui's dolphins for commercial, recreational, scientific, or educational purposes does not appear to pose a significant threat to Maui's dolphin. Maui's dolphins have not been exploited commercially; although, Baker (1978, citing Abel et al. 1971) noted that, between 1969 and 1972, a few Hector's dolphins were taken for live exhibition at Marineland of New Zealand. It's not clear which subspecies was taken. Hector's dolphins have also apparently been taken for food, oil, and bait; however, the extent to which this occurred is unknown (Pichler et al. 2003).

There is some evidence that commercial dolphin-watching vessels and swim-with-dolphin operations cause behavioral changes in Hector's dolphins (Bejder et al. 1999, Constantine 1999, Martinez et al. 2012). Such tourism activities, however, seem to occur at a relatively low intensity within the range of Maui's dolphins and instead are much more concentrated elsewhere—mainly the Bay of Islands and the Bay of Plenty on the east coast of the North Island and various locations of the South Island (Martinez 2010b). Although tourism and the potential related impacts of boat strike, noise, and displacement were identified as threats in the risk assessment completed by Currey et al. (2012), the expert panel did not think these threats were likely to affect population trends within the next 5 years.

Disease or Predation

Predation of Hector's dolphins by several shark species, such as seven-gill sharks (*Notorhynchus cepedianus*) and blue sharks (*Prionace glauca*), is known to occur; however, predation rates are not known (Slooten and Dawson 1988). Predation was not considered to be posing a threat to Maui's dolphins in the recent risk assessment by Currey et al. (2012).

Disease is another known source of mortality for Hector's dolphins. In their evaluation, Currey et al. (2012) categorized natural disease, stress-induced disease, and domestic animal vectors as posing threats that are likely to have population level effects on Maui's dolphins within the next 5 years. Prevalence of infectious disease and associated behavioral impacts and mortality rates have not been well studied in Hector's dolphins, so the significance of this source of mortality remains unclear. Recently, Roe et al. (2013) found that 7 of 28 Hector's dolphins (25 percent), including 2 of 3 Maui's dolphins, collected between 2007 and 2011 and later necropsied had died as a result of *Toxoplasma gondii* infection. Of the 22 dolphins for which a definitive cause of death was established, a total of ten (45 percent) were found to have died from infectious disease (*T. gondii* infections, bacterial infection, or fungal infection). These findings suggest that infectious disease may be a significant source of mortality for Hector's dolphins. In addition, while toxoplasmosis is typically a secondary disease in cetaceans, resulting in symptoms in immunosuppressed individuals rather than healthy individuals, there was no evidence of immunosuppression in these cases (Roe et al. 2013). This finding suggests that Hector's dolphins may be particularly susceptible to toxoplasmosis. Roe et al. (2013) also note that toxoplasmosis may have other effects beyond direct mortality and could be an important cause of neonatal loss. The source of the *T. gondii* infection could not be determined in this study, but exposure may be occurring through freshwater run-off from terrestrial sources (Roe et al. 2013). Overall, while data remain limited for Maui's dolphins, the available data suggest that disease, especially toxoplasmosis, is posing a threat to Maui's dolphins.

Inadequacy of Existing Regulatory Mechanisms

A number of regulatory measures have been put in place to address bycatch of Maui's dolphins. Although data on bycatch of Maui's dolphins are limited, fishery-related mortality has been identified as posing a significant threat to Maui's dolphins. The risk assessment completed by Currey et al. (2012) attributed 95.5 percent of the estimated human-caused mortalities forecasted to occur over the next 5 years to legal and illegal fishing-related activities. This translated into an estimated median of 4.97 Maui's dolphin mortalities per year due to fishing activities (95 percent confidence interval (CI) = 0.28—8.04). To help inform the risk assessment of Currey et al. (2012), Wade et al. (2012) calculated the Potential Biological Removal (PBR) for Maui's dolphins and estimated it as one dolphin mortality every 10 to 23 years. PBR, which is a management tool specific to the U.S. Marine Mammal Protection Act (MMPA) is used to evaluate allowable levels of human-caused mortality (Wade 1998; Wade et al. 2012). (PBR is defined under section 3 of the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (16 U.S.C. 1362).) This analysis indicates that the estimated bycatch mortality of Maui's dolphins greatly exceeds PBR.

The DOC maintains a database of reports from the public of dead and stranded Hector's dolphins, and between 1921 and 2008, 45 percent of the reports for Maui's dolphins (4 of 11 dolphins) for which cause of death could be determined were found to have died due to ''possible,'' ''probable,'' or ''known'' entanglement (*http://www.doc.govt.nz/our-work/hectors-and-maui-dolphin-incident-database/1921–2008/*). Between July 2008 and January 2016, the DOC Incident Database lists an additional four confirmed Maui's dolphins, and of the two with determinable causes of death, one was an adult female found dead in January 2012 from entanglement in a commercial net set (*http://www.doc.govt.nz/our-work/hectors-and-maui-dolphin-incident-database/).* (The other dolphin was recorded as having died due to natural causes.)

Bycatch of Maui's dolphins occurs mainly in gillnet gear, but bycatch in trawl gear is likely also posing a threat (Bird and Palka 2013). Although commercial gillnetting had been practiced in New Zealand since 1930 (DOC and MFish 1994), fishing effort was low until the mid-1970s (Dawson 1991). By the 1980's, bycatch of dolphins in gillnets became a serious concern in New Zealand (Dawson and Slooten 2005). Eventually, in 2003, MFish began to address bycatch of Maui's dolphins by closing waters to set netting from Maunganui Bluff to Pariokariwa Point out to 4 nmi (7.4 km) and inside the entrance to the Manukau Harbor. Trawling was also prohibited out to 2 nmi (3.7 km) along most of this same stretch of coastline and out to 4 nmi within a short portion of the Maui's dolphin's core range (see Figure 7 in Manning and Grantz 2016). Commercial and recreational gillnetting continued within harbors and in the southern portion of the Maui's dolphin range.

In 2007, when the draft TMP was released, the MPI and DOC concluded that bycatch was still the most serious threat to Hector's dolphins. In 2008, MFish expanded protection for Maui's dolphins by extending the set netting closure out to 7 nmi (13.0 km; instead of 4 nmi (7.4 km)) and farther into Manukau Harbor. Then, in 2012, following an entanglement of a Maui's dolphin off Cape Egmont, an interim ban was put in place from Pariokariwa Point south to Hawera for all set netting out to 2 nmi (*Gazette,* 28 June 2012) and for commercial set netting between two and seven nautical miles offshore unless an MPI observer was on board (see Figure 8 in Manning and Grantz 2016). In 2013, the MPI determined that their interim measures would be made permanent (MPI and DOC 2013).

This steady expansion of area-based, bycatch-reduction measures along the west coast of the North Island has resulted in a substantial level of protection for Maui's dolphins. However, bycatch remains a concern for Maui's dolphins, because current fisheries restrictions do not extend throughout their range and certain forms of fishing still occur within the core portion of the subspecies' range. In particular, commercial and non-commercial set netting occur within all west coast harbors, with all areas within the harbors, from intertidal areas to the deeper channels, being fished for species like flounder, mullet, and rig (MFish and DOC 2007b). Sightings data (Slooten et al. 2005) and passive acoustic data (Rayment et al. 2011a) indicate that Maui's dolphins occur at least occasionally within west coast harbors and therefore may be at risk of entanglement in these areas (MFish and DOC 2007b). In addition, the southern extension of the gillnetting prohibitions that was put in place in 2012 only extends out to 2 nmi (3.7 km) from shore, as opposed to the 7 nmi (13 km) boundary elsewhere along the west coast. Beyond 2 nmi, gillnetting is permitted in this portion of the range if an MPI observer is on board. Furthermore, the extension of the closed area in the southern portion of the

dolphin's range may not extend far enough southward. The risk assessment of Currey et al. (2012) used survey and non-survey sightings data to develop a distribution for Maui's dolphins that extends to Whanganui, which is about 70 km south of the current gillnet closed area boundary at Hawera. Trawling also continues in waters past the existing 2 nmi or 4 nmi offshore boundary for the trawling closed area—even in the core portion of the Maui's dolphin's range. Currey et al. (2012) concluded that trawling in this zone was a source of continued bycatch risk for Maui's dolphins.

Before the protected area extensions in 2012, estimated bycatch was about 4.69 to 13.01 dolphins per year or about 75 times the PBR of 0.044–0.1 Maui's dolphins per year (Currey *et al.* 2012).). The recent extensions to the protection measures have reduced the estimated bycatch to 3.28 − 4.16 Maui's dolphin mortalities per year or about 54 times PBR (Slooten 2014).

A series of regulations have been put in place to address some of the threats associated with mining and petroleum industry activities. The West Coast North Island Marine Mammal Sanctuary (WCNIMMS) was established in 2008 as part of the draft TMP, and restrictions were put in place on seabed mining and acoustic seismic surveys within the sanctuary. In particular, seabed mineral mining was prohibited out to 2 nmi (3.7 km) along the full length of the sanctuary and out to 4 nmi (7.4 km) south of Raglan Harbor to north of Manakau Harbor. However, a large swath of the sanctuary, which extends out 12 nmi (22.2 km) from the coast, remains open to mining. A range of operational requirements has been specified for seismic surveying within the sanctuary (Gazette: *Gazette,* 25 September 2008), including mandatory notification prior to conducting surveys and mandatory reporting of any interactions with dolphins. Qualified marine mammal observers are required on all survey ships to help ensure that no whales or dolphins are too close to the ship. When visibility is poor, hydrophones must be used to listen for whale and dolphin sounds (*Gazette,* 25 September 2008). In August 2012, the DOC Minister and the Minister of Energy and Resources developed a voluntary ''Code of Conduct for Minimizing Acoustic Disturbance to Marine Mammals from Seismic Surveys Operations.'' This voluntary guidance was intended to increase protections for Maui's dolphins, in part by identifying their entire historical range out to 100m water depth as an ''Area of Ecological Significance,'' which triggers additional mitigation requirements. Shortly thereafter, in November 2013, the DOC and MPI announced a decision to formally regulate seismic surveying and make the 2012 code of conduct a mandatory standard. The mandatory code of conduct applies to Territorial waters, the Exclusive Economic Zone (EEZ) of New Zealand, and within all marine mammal sanctuaries, and it continues to include requirements for planning, operations, monitoring, and reporting. The 2013 code of conduct is currently undergoing review and may be further augmented to increase protections for Maui's dolphins and other species of concern.

As indicated in the discussion above, there are gaps in the current regulatory protections for Maui's dolphins. Population viability analyses performed under previous management scenarios have predicted continued declines in abundance of Maui's dolphins or failure to recover (Burkhart and Slooten 2003, Slooten 2007a), as do more recent analyses under the current fisheries management regime (Slooten 2013). More recent modelling work also indicates that recovery of this subspecies will occur only under circumstances where human-induced mortality is extremely minimal (Wade et al. 2012; Slooten 2013). Therefore, we conclude that while the protections for Maui's dolphins have gradually increased from 2003 to present, there is insufficient evidence to conclude that current regulatory measures are adequate in terms of addressing threats to this subspecies.

Other Natural or Manmade Factors Affecting Its Continued Existence

Other threats identified in the 2012 risk assessment and characterized as being likely to affect population trends within the next 5 years include fishing vessel noise, disturbance, and trophic effects of fishing; however, these threats were considered to collectively make very limited contributions to the overall level of human-caused mortality (Currey et al. 2012). Although vessel traffic and its associated impacts of disturbance and boat strikes were considered to contribute little to annual mortality of Maui's dolphins, mortality due to vessel traffic was rated as having a 47.8 percent chance of exceeding PBR (Currey et al. 2012). Due to their coastal distribution and apparent attraction to small boats (Baker 1978, Slooten and Dawson 1988), the potential for boat strikes could be considered relatively high, but reports of boat strikes have been extremely rare (Stone and Yoshinaga 2000a). None of the reports within the DOC Incident Database from July 2008 to April 2016 are listed with boat strike as the cause of death.

Summary of ESA Section 4(a)(1) Factors Affecting SI Hector's Dolphin

Available information regarding historical, current, and potential threats to SI Hector's dolphins was thoroughly reviewed and is discussed in detail in the status review report (Manning and Grantz 2016). We summarize information regarding these threats below according to the factors specified in section 4(a)(1) of the ESA.

The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

As discussed earlier for Maui's dolphins, persistent chemical pollutants are a concern for SI Hector's dolphins, which can theoretically accumulate high concentrations of contaminants due to their longevity, high trophic-level, and naturally high blubber content (Stockin et al. 2010). In cetaceans, biological impacts resulting from accumulation of contaminants such as heavy metals, PCBs, and organochlorine (OC) pesticides include endocrine disruption, reproductive impairment, immune suppression, and elevated infectious disease (*e.g.*, Fujise et al. 1988, Kuiken et al. 1994, O'Hara and O'Shea 2001, Schwacke et al. 2002, Jepson et al. 2005, Wells et al. 2005). As previously mentioned, Stockin et al. (2010) found high PCB and OC contaminant loads in Hector's dolphins (n=27, SI Hector's dolphins; n=3, Maui's dolphins) sampled from 1997 to 2009, and a roughly two-fold increase in levels of OC pesticides than had been previously reported for Hector's dolphins by Jones et al. (1999). However, no PCB concentrations were above thresholds associated with reproductive and immunological effects (Stockin et al. 2010). High levels of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs), which are two related and ubiquitous chemical contaminants, were also found to occur at unexpected levels in the blubber of six SI Hector's dolphins (Buckland et al. 1990).

Plastic marine debris is also a concern for SI Hector's dolphins. Plastics and other synthetic, non-biodegradable materials in the marine environment create the potential for entanglement, injury, and ingestion by various marine species. As with other marine mammals, Hector's dolphins may become entangled and subsequently wounded, or have impaired foraging ability, and/or increased susceptibility to predation. Ingestion of plastics by marine species has been associated with a multitude of

impacts including blockage of the digestive tract, starvation, reduction in reproductive capacity, drowning, and possible accumulation of toxic compounds (Laist 1997, Gregory 2009). Plastic debris was found in the stomach of a SI Hector's dolphin that stranded along the coast of the Canterbury region, and there are anecdotal reports of SI Hector's dolphins off Banks Peninsula with fishing line or netting entangling the head or upper body and cutting into the blubber (MFish and DOC 2007b).

Mining occurs along the west coast of the South Island where there are significant nearshore and beach deposits of ilmenite (mined mainly for titanium dioxide). The TMP for Hector's dolphins identified possible impacts of mining activity, including loss or reduction in prey species, noise, and vessel disturbance (MFish and DOC 2007b). Based on a search of the NZPM's map in June 2016 (*http://data.nzpam.govt.nz/permitwebmaps?commodity=minerals*), a large portion of the SI Hector's dolphin west coast range is included in a prospecting permit application, indicating the potential for continued mining activity in this region.

Prospecting permits for petroleum cover large areas along the southeastern coast of the South Island (*http://data.nzpam.govt.nz/permitwebmaps?commodity=petroleum,* June 2016). Drill ships are also operated off Canterbury and along the west coast of the South Island. Potential habitat impacts from these activities include oil spills; increased vessel traffic; and acoustic disturbances from seismic surveys, sonar, and drilling activities. Contaminants in oil and gas may impact the health of the dolphins, and the associated noise may disrupt normal behaviors, such as navigating, migrating, and feeding (Gordon et al. 2003, Thompson 2012).

Overall, it is clear that SI Hector's dolphins are exposed to multiple habitat-related threats. However, the extent to which SI Hector's dolphins are being impacted—both individually and at a population level—by these habitat-related threats is not yet established due to insufficient data (MFish and DOC 2007b). It is possible that SI Hector's dolphin habitat will become increasingly degraded in the future with increasing human use of the coastal zone and its resources (MFish and DOC 2007b).

Overutilization for Commercial, Recreational, Scientific or Educational Purposes

Hector's dolphins have not been systematically captured for any commercial, recreational, scientific, or educational purposes; although, as noted earlier, a few Hector's dolphins have been taken for live exhibition. While Hector's dolphins have also apparently been taken for food, oil, and bait, the extent to which this occurred is not known (Pichler et al. 2003).

There is growing evidence that overutilization in the form of commercial dolphin-watching and swim-with-dolphin operations, which are increasingly popular tourist activities in New Zealand, are a concern for SI Hector's dolphins. The majority of the commercial viewing and encounter operations in New Zealand occur around the South Island and are especially popular along the east coast off Kaikoura and within Akaroa Harbor, which have become major eco-tourist destinations in New Zealand (Martinez 2010b). Within Akaroa Harbor, and as of 2010, there were up to about 18 daily 'swim-with' trips and 14 dolphin-watching trips per day between November and March that specifically targeted Hector's dolphins (Martinez 2010b). In addition to permitted commercial operations, opportunistic viewing also occurs by both commercial and recreational boaters.

Dolphin-watching and swim-with-dolphin operations have been shown to cause behavioral changes in Hector's dolphins (Bejder et al. 1999, Constantine 1999, Martinez et al. 2012). In a study of SI Hector's dolphins in Porpoise Bay, Bejder et al. (1999) found that while SI Hector's dolphins were not displaced by dolphin-watching tour boats, the dolphins did respond by approaching the boats, especially initially, and by forming significantly tighter groupings. A possible interpretation of the behavioral response of 'bunching' is that the boat is perceived as some kind of threat and may in fact cause the animals some level of stress (Constantine 1999). In Akaroa Harbor, Martinez (2010b) found that both diving—which is considered a feeding behavior—and travelling were significantly disrupted by vessel interactions. Evidence also indicates that the use of sounds to attract Hector's dolphins to swimmers affects the behavior of the dolphins (Martinez et al. 2012). For example, both the number and the duration of close interactions or approaches by Hector's dolphins were significantly greater when a swimmer banged two rocks together underwater (Martinez et al. 2012). Such deliberate efforts to attract Hector's dolphins could have behavioral consequences such as disrupted or reduced foraging time, which in turn can have biological consequences (Martinez et al. 2012). For some regional dolphin populations, a relatively large portion of that population can be exposed to the tourist activities occurring in a particular harbor or area. For example, about 80 percent of the SI Hector's dolphins that were photo-identified in surveys around Banks Peninsula between 1985 and 2006 had alongshore home ranges that included Akaroa Harbor, and for half of these dolphins, Akaroa Harbor served as a core use or ''hub'' area (Rayment et al. 2009a).

Longer-term impacts of these tourism activities on SI Hector's dolphins are not yet clear but could include physiological stress, reduced energy intake, and possibly even reduced calving success. Linkages between immediate behavioral responses to vessel traffic and longer-term biological consequences have already been established for other species (*e.g., Tursiops* sp.) and include declines in abundance and reduced reproductive success in females (Bejder et al. 2006a, 2006b, 2006c). Given this information and the fact that SI Hector's dolphin populations encounter dolphin-watching operations in multiple areas of their range (*e.g.,* Porpoise Bay, Timaru, Akaroa Harbor, and Marlborough Sounds), dolphin-watching and 'swim-with' activities are likely posing a significant but sub-lethal threat to this subspecies. The actual magnitude of this threat cannot yet be established, but this threat is likely to persist given the popularity and lucrativeness of the eco-tourism industry in New Zealand.

Disease or Predation

As previously mentioned, predation of Hector's dolphins by several shark species, such as broadnose seven-gill sharks (*N. cepedianus)* and blue sharks (*P. glauca*), is known to occur (Slooten and Dawson 1988). Although seven-gill sharks are particularly common around Banks Peninsula, predation rates are not known (Slooten and Dawson 1988), and there is no evidence to suggest predation is posing a threat to this subspecies.

Prevalence of infectious disease and associated impacts have not yet been well studied in Hector's dolphins, but recent evidence suggests that infectious disease may be a significant source of mortality for SI Hector's dolphins. In particular, Roe et al. (2013) found that out of 22 dolphins collected between 2007 and 2011 for which a definitive cause of death was established, a total of ten (45 percent) had died due to infectious disease (*Toxoplasma gondii* infections, bacterial infection, or fungal infection). Five of the 22 SI Hector's dolphins (23 percent) were found to

have died as a result of *T. gondii* infection (toxoplasmosis, Roe et al. 2013). While toxoplasmosis is typically a secondary disease in cetaceans, resulting in symptoms in immunosuppressed individuals rather than healthy individuals, there was no evidence of immunosuppression in these cases, suggesting that Hector's dolphins are particularly susceptible to toxoplasmosis (Roe et al. 2013). Beyond direct mortality, toxoplasmosis can also have other biological consequences, such as behavioral changes, reduced reproductive rate, and neonatal loss. Because the fatal cases of *T. gondii* infection in this study were distributed throughout almost the entire range of the SI Hector's dolphin, exposure is probably occurring over broad areas. Overall, the available data suggest that disease, especially toxoplasmosis, is posing a threat to SI Hector's dolphins.

Inadequacy of Existing Regulatory Mechanisms

As with Maui's dolphins, a number of regulatory measures have been put in place to address bycatch of SI Hector's dolphins. As previously noted, by the 1980's, bycatch of Hector's dolphins in commercial and recreational gillnets was recognized as a serious issue in New Zealand (Dawson and Slooten 2005). In the South Island, a region of particular concern was the Pegasus Bay and Canterbury Bight area along the east coast, where there was a known high degree of overlap between inshore gillnetting and a locally abundant population of SI Hector's dolphins. To begin to quantify the level of bycatch, Dawson (1991b) conducted fisherman interviews during 1984–1988 and found that at least 230 SI Hector's dolphins had died due to entanglement in commercial and recreational gillnets in the Pegasus Bay and Canterbury Bight region during this period. Ages of entangled dolphins that were physically examined (n=43) ranged from younger than 1 year to about 20 years old, but a high proportion (63 percent) were 3 years old or younger, suggesting that younger dolphins are especially vulnerable to entanglement (Dawson 1991b). Overall, this level of bycatch (*i.e.,* 230 over 4 years or about 57.5 entanglement mortalities per year), greatly exceeded the estimated population growth rate for this regional population (1.8 − 4.9 percent or 13.3 − 36.3 individuals per year; Dawson and Slooten 1988b, Slooten and Lad 1991). Subsequent analyses based on observer data, suggested that bycatch rates during this period (1984 − 1988) were actually much higher, averaging 100 dolphins per year (Davies *et al.* 2007).

Released in 2007, the TMP for Hector's dolphins identified set gillnetting as the greatest source of human-caused mortality of Hector's dolphins but also discussed how SI Hector's dolphins are incidentally captured in other gear types (MFish and DOC 2007b). Between 1921 and when the TMP was released, the DOC Incident Database indicates there had been 19 reports of Hector's dolphin mortalities due to trawls, which corresponds to 9 percent of the reported incidents with a known cause of death. All 19 of these reports occurred off the South Island within 2 nmi (3.7 km) of shore (MFish and DOC 2007b). Entanglement deaths of SI Hector's dolphins have also occurred in pot traps (*e.g.,* rock lobster pots). Three such incidents were reported (in 1989, 1997, and 2004) and all occurred off Kaikoura, which is along the northeast coast of the South Island (MFish and DOC 2007b).

In reaction to the growing concern over bycatch of Hector's dolphins, the DOC established the Banks Peninsula Marine Mammal Sanctuary (BPMMS) in 1988. When it was first established, the sanctuary extended from Sumner Head to the Rakaia River and out to 4 nmi (7.4 km), covering an area of about 1,140 sq km. All gillnetting within the sanctuary (with some harbor exceptions) was prohibited from November through February, and additional gear restrictions that applied throughout the remainder of the year essentially resulted in a year-round ban of commercial gillnetting within the sanctuary (Dawson and Slooten 1993). Additional restrictions on recreational gillnetting, such as limiting fishing to daylight hours only and requiring continuous tending of nets, were also enacted to help further reduce bycatch mortality. Based on fisheries observer data, bycatch in gillnets continued to occur to the immediate north and south of the sanctuary at unsustainable levels (Baird and Bradford 2000, Dawson and Slooten 2005), and there was little evidence of improved survival of SI Hector's dolphins within the sanctuary (Cameron et al. 1999). In recognition that further protection of SI Hector's dolphins was needed, the sanctuary boundaries were expanded in 2008 to the north and south and out to 12 nmi (22.2 km) offshore, but no restrictions on fishing activities were applied to the area beyond the original 4 nmi (7.4 km) sanctuary boundary (MFish and DOC 2007b, DOC 2008). The sanctuary currently encompasses about 4,130 sq. km and 389 km of coastline.

In addition to the expansion of BPMMS, a series of fishing restrictions were put in place in 2008 to reduce bycatch of SI Hector's dolphins elsewhere around the South Island. Along the east and south coasts, from Cape Jackson in the Marlborough Sounds to Sandhill Point east of Fiordland, commercial gillnetting was banned out to 4 nmi (7.4 km) from shore, except at Kaikoura, where it was banned out to 1 nmi (1.9 km), and in Te Waewae Bay, where it is banned out to about 9 nmi (16.7 km) from shore (MFish 2008). Recreational gillnetting was allowed to continue in specified harbors and estuaries; and, in the case of flatfishing (*e.g.* for *Rhombosolea* spp.), gillnetting was permitted from April through September in the upper reaches of four harbors on Banks Peninsula, and in a similar area in Queen Charlotte Sound. Trawling was also prohibited along the east and south coasts from Cape Jackson to Sandhill Point out to 2 nmi (3.7 km), with an exception for trawls using a low headline net (used to target flatfish, MFish 2008). On the west coast of the South Island, again with some exceptions for certain harbors, inlets, estuaries, river mouths and lagoons, recreational set netting was banned year-round in waters out to 2 nmi (3.7 km) and from Cape Farewell on Farewell Spit to Awarua Point north of Fiordland; and commercial set netting was banned in the same area from December through February (MFish 2008). No trawling prohibitions were implemented for the west coast, and no fishing prohibitions were instituted along the north coast of the South Island. Since 2008, some amendments and changes to these fishery restrictions have been made for particular fishing activities and specific locations, but these changes are limited in scope and scale and are not discussed in detail here; see Manning and Grantz (2016) for additional detail.

Recently, in 2013, the DOC established the Akaroa Harbor Marine Reserve at the mouth of Akaroa Harbor on Banks Peninsula. This reserve includes about 512 hectares of habitat or about 12 percent of the total harbor area (*www.doc.govt.nz/parks-and-recreation/places-to-go/canterbury/places/banks-peninsula-area/akaroa-marine-reserve/*). As a result of this designation, which provides protection to all marine life within the reserve, fishing and any other taking of living or non-living marine resources is prohibited.

Despite the gradual increase in fishing restrictions around the South Island, exposure of SI Hector's dolphins to fishing activity remains fairly high

throughout the South Island. On the west coast, where the dolphins are known to occur year-round and range to about 6.5 nmi (12.0 km) offshore (Mackenzie and Clement 2016), commercial gillnetting is prohibited only out to 2 nmi for just 3 months of the year, and there are no prohibitions on trawling. Survey sightings off the south coast indicate that the dolphins at least occasionally occur as far as 9.6 nmi (17.8 km) from shore and outside of protected areas (Clement et al. 2011). On the east coast, a substantial portion of the population is distributed well beyond the current closed areas, particularly in winter months (*e.g.,* out to 18.2 nmi (33.7 km), Rayment et al. 2006, Rayment et al. 2010b); and gillnetting is still allowed within the BPMMS in waters between the original (4 nmi) and the extended offshore boundary (12 nmi).

Evidence of continued bycatch around the South Island is available in the DOC Incident Database (*www.doc.govt.nz/our-work/hectors-and-maui-dolphin-incident-database/*), which lists 13 entanglement mortalities between May 2009 and April 2015; and, in 2012, two Hector's dolphins were found stranded and wrapped in a gillnet just north of Christchurch (Slooten 2013, 2016). Unfortunately, the actual level of bycatch since 2008 is unknown and the database records provide only a subset of the total bycatch (Slooten and Dawson 2016). The majority of mortalities captured in the database are also listed as having unknown or indeterminable causes. Pichler et al. (2003) reported that of the dolphins caught by commercial and recreational gillnet fishers and brought in for necropsies, only about half have discernable net markings, contributing further to the underestimation of bycatch rates. Some additional data are available from commercial gillnetting observer programs. For example, based on low observer coverage of commercial gillnet vessels from May 2009 through April 2010 (about 15.8 percent of fishing days and about 13 percent of total sets), three SI Hector's dolphin mortalities were recorded from the east coast of the South Island (ECSI; MPI 2011b, Slooten and Davies 2012). Slooten and Davies (2012) analyzed these data and estimated that 23 SI Hector's dolphins (range of 4 − 48, CV = 0.21) were caught off the ECSI in that year.

Evidence from multiple modelling efforts suggests that SI Hector's dolphins will continue to decline due to bycatch under the current management measures. For example, for the most recent assessment of the BPMMS population, which has benefited from almost three decades of protection, Gormley et al. (2012) conducted a mark-recapture analysis of photographically identified dolphins (n=462) from 1986 to 2006 to compare annual survival rates before and after establishment of the sanctuary and associated gillnetting restrictions. Results indicated that between the two time periods, mean survival probability increased by 5.4 percent (from 0.863 to 0.917), which corresponds to a 6 percent increase in population growth. However, the population projections using the post-sanctuary survival rate also corresponded to a mean annual population decrease of 0.5 percent per year, with only 41 percent of the model simulations resulting in a population increase (Gormley et al. 2012). As noted by Gormley et al. (2012), this finding is consistent with other research indicating that the BPMMS is too small to allow recovery of this SI Hector's dolphin population (Rayment et al. 2006, Slooten et al. 2006b, Slooten and Dawson 2008, Rayment et al. 2010b, Slooten and Dawson 2010). A population viability analysis by Slooten and Dawson (2010), which relied on commercial gillnet observer data for a portion of the east coast to estimate bycatch (from Baird and Bradford 2000), projected that the west coast population would continue to decline (by just over 1,000 individuals by 2050), the Banks Peninsula population would continue to decline, and the remainder of the east coast population would slowly increase (by 450 individuals by 2050). In a review of risk assessments for SI Hector's dolphins, Slooten and Davies (2012) found that despite differing modelling approaches and assumptions applied, the risk assessments were highly consistent and were in general agreement that recovery of SI Hector's dolphins is unlikely under the current level of protections.

Overall, based on the available information, the existing measures to address the threat of bycatch of SI Hector's dolphins appear inadequate, and we conclude that bycatch continues to pose a significant risk to this subspecies. The risk of bycatch in commercial and recreational trawl and gillnet fisheries remains high given the known distribution of the dolphins relative to areas closed to fishing, especially on the west and north coasts (Faustino et al. 2013, Slooten 2013). Although bycatch of SI Hector's dolphins has been slowed by the fisheries restrictions implemented in 2008, available risk analyses indicate that population decline is expected to continue (Slooten and Dawson 2010, Gormley et al. 2012, Slooten and Davies 2012). Finally, enforcement of the existing regulations may be insufficient. Illegal fishing has been reported for Banks Peninsula (Slooten and Davies 2012), and illegal fishing is discussed in the TMP (MFish and DOC 2007b). There are insufficient data available to evaluate the level of compliance with existing regulations.

Several management measures have been implemented to address some of the threats associated with mining and petroleum industry activities. For both petroleum and minerals mining activities, a permit is generally required from local authorities under the Resource Management Act 1991 for mining activities within New Zealand's territorial sea (within 12 nmi from the coast). For mining activities beyond the territorial sea, the Environmental Protection Authority (EPA) manages the environmental effects of activity under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act) and its regulations, which establish which activities require permits and impact assessments. Seismic surveys are permitted under the EEZ Act if they adhere to the Code of Conduct for Minimizing Acoustic Disturbance to Marine Mammals from Seismic Survey Operations (DOC 2013). In 2013, the DOC and MPI updated their seismic survey guidelines and announced a decision to make the code of conduct a mandatory standard. The mandatory code of conduct applies to Territorial waters, the EEZ of New Zealand, and within all marine mammal sanctuaries, and includes requirements for planning, operations, monitoring, and reporting. The 2013 code of conduct is currently undergoing review and may be further augmented to increase protections for Hector's dolphins and other species of concern. Discharge management plans associated with mining activities also must be approved under the Maritime Rules Part 200, Maritime New Zealand prior to drilling.

To help manage non-fishing-related threats to Hector's dolphins, the DOC expanded BPMMS in 2008 and established an additional three marine mammal sanctuaries– the Catlins Coast, Clifford and Cloudy Bay, and Te Waewae Bay Marine Mammal Sanctuaries (MMS). The Catlins Coast MMS lies along the south coast of the South Island (SCSI) between Three Brother's Point and Busy Point and extends 5 nmi to 6.9 nmi offshore. The sanctuary encompasses about 660 sq km of marine habitat and 161 km of coastline. The Clifford and Cloudy Bay MMS, which lies on the northeast coast,

includes about 1,427 sq km and 338 km of coastline between Cape Campbell to Tory Channel, and extends 12 nmi offshore. The Te Waewae Bay MMS includes this entire SCSI bay and encompasses about 359 sq km of marine habitat and 113 km of coastline. Protections for SI Hector's dolphins that accompanied the expansion of BPMMS and the designation of these three additional sanctuaries were specific requirements for conducting seismic surveys. Included among the requirements for seismic surveys are mandatory notification prior to conducting surveys, mandatory reporting of any interactions with dolphins, and presence of qualified marine mammal observers on all survey ships (*Gazette,* 23 September 2008). There are no additional restrictions on mining activities within the sanctuaries.

Overall, while there is a clear regulatory process in place for reviewing and permitting mining activities, given the existing information, it is not clear whether existing management measures are adequate to minimize acoustic and other impacts to SI Hector's dolphins such that these activities do not pose a threat to the subspecies.

The dolphin-watching industry in New Zealand is regulated under the Marine Mammals Protection Regulations (MMPR), which were revised in 1992 in response to the growth in marine mammal-based tourism (Constantine (1999), citing Donoghue 1996). Among other provisions, these regulations govern the issuance of permits to commercial operators and, as discussed above, the behavior of vessels around dolphins. As a permit issuance criterion, commercial tour operators are required to ensure that their activities have ''no significant adverse effect'' on their targeted population (MMPR, 1992; Appendix 1.4). Given the high level of commercial dolphin watching operations in some portions of the SI Hector's dolphin's range, the repeat exposure of individual dolphins to vessels and/or 'swim-with' activities, and the potential linkage to long-term biological consequences, it is possible that the current level of tourism is having a significant adverse impact on the subspecies. We find that there are insufficient data by which to verify that this permit issuance criterion is being met.

Pursuant to the MMPR, all boaters, both recreational and commercial, must adhere to certain rules when operating around marine mammals. For example, no more than 3 vessels and/or aircraft are allowed within 300 m of any marine mammal at the same time; speeds must be kept to 'no wake' speeds when within 300 m of any marine mammal; swimmers are prohibited from swimming with dolphin pods with very young calves; and boats are prohibited from circling, obstructing, or cutting through any group (MMPR 1992, part 3). Compliance monitoring is limited and sufficient quantitative data are not available to assess compliance by commercial and recreational boaters with these regulations (MFish and DOC 2007b). Thus, it is difficult to determine whether these regulations, and the associated education and enforcement, adequately address boat-related disturbance and boat strikes, which are discussed further in the section below.

Other Natural or Manmade Factors Affecting Its Continued Existence

Other potential threats to SI Hector's dolphins include vessel noise, trophic effects of fishing, and climate change; however, there are no data available to assess how or whether these factors are contributing to the overall level of human-caused mortality or population trends. Boat strikes, however, are a documented source of mortality for Hector's dolphins, and the TMP identifies vessel traffic as a threat that can result in disturbance and mortality (MFish and DOC 2007b). Vessel traffic has increased around the South Island, especially in areas more densely populated by people, and reports of cetaceans with propeller scars have increased (Martinez 2010b). Stone and Yoshinaga (2000) reported the death of two calves on consecutive days in Akaroa Harbor. In 1999, two calves, both estimated to be younger than 4 weeks old, were recovered on successive days from Akaroa Harbor, and autopsy results confirmed that one calf was killed by collision with a boat and the other calf by a propeller strike (Stone and Yoshinaga 2000). Stone and Yoshinaga (2000) suggest that mother and calf pairs may be less capable of evading boats if they are approached. Although the specific cause of death was unknown, the TMP also states that there were an additional nine cases from around the South Island in which cause of death was some form of trauma (MFish and DOC 2007b). Overall, data are too limited to assess the rate of boat strikes, but existing information clearly indicates that boat strikes are contributing to the total level of human-caused mortality.

Demographic Risks Affecting Extinction Risk for Maui's Dolphins

In our status review, data and information about demographic risks to Maui's dolphins were considered according to four categories—abundance and trends, population growth/productivity, spatial structure/connectivity, and genetic diversity. Each of these demographic threat categories was then rated according to the following qualitative scale:

Very low risk: It is unlikely that this factor contributes significantly to risk of extinction, either by itself or in combination with other demographic factors.

Low risk: It is unlikely that this factor contributes significantly to long-term or near future risk of extinction by itself, but there is some concern that it may, in combination with other demographic factors.

Moderate risk: This factor is likely to contribute significantly to long-term risk of extinction, but does not by itself constitute a danger of extinction in the near future.

High risk: This factor contributes significantly to long-term risk of extinction and is likely to contribute to short-term risk of extinction in the near future.

Very high risk: This factor by itself indicates danger of extinction in the near future. (Note: The term ''significantly'' is used here as it is generally defined—*i.e.,* in a sufficiently great or important way as to be worthy of attention.)

In the sections below, we present information from Manning and Grantz (2016) to summarize the demographic risks facing Maui's dolphins.

A. Abundance and Trends

Based on line-transect aerial surveys conducted in January 2004, Slooten et al. 2006a estimated a total population size of 111 Maui's dolphins (95 percent CI = 48–252). A more recent abundance estimate, derived through genetic mark-recapture analysis of samples collected in 2010 and 2011, is 55 dolphins over 1 year of age (95 percent CI: 48 − 69, Hamner et al. 2012b). This estimate is based on a genetic mark-recapture analysis using 37 biopsy samples collected in 2010 and 36 biopsy samples collected in 2011, which were genotyped across 20 variable microsatellite loci and analyzed in a closed-sample model (Lincoln-Peterson estimator with Chapman correction, Chapman 1951; Hamner et al. 2012b). Both of these estimates indicate that the abundance of Maui's dolphins is critically low.

Small populations can face higher risks of extinction from a range of factors, including stochastic demographic processes, genetic effects, and environmental catastrophes; and various theoretical abundance

thresholds have been proposed as indicators of relative extinction risk (Gilpin and Soulé 1986, Allendorf et al. 1987, Mace et al. 2008). Both of the most recent abundance estimates for Maui's dolphins are well below commonly cited theoretical thresholds indicating a very high risk of extinction—*e.g.,* 250 total individuals (Allendorf et al. 1987) and 250 mature individuals (Mace et al. 2008).

Although historical abundance estimates are not available, Slooten (2007a) estimated population abundances for 1970 by back-calculating, using a population estimate of 117 dolphins (CV= 0.44) and estimates of fishing effort and rate of dolphin bycatch. Results suggest that the abundance of Maui's dolphins in 1970 was about 1,729 dolphins (CV= 0.51, Slooten 2007, Slooten and Dawson 2010). Martien et al. (1999) also projected numbers back to 1970 using an earlier abundance estimate published by Dawson and Slooten (1988; *i.e.,* 134 dolphins), and estimated there were about 448 Maui's dolphins in 1970. Although there are differences in the models, assumptions, input data, and results of these two analyses, these estimated abundances for 1970 suggest the Maui's dolphin population has declined by about 90 percent or more when compared to the current abundance estimate of 55 dolphins over 1 year of age.

Available evidence suggests that abundance of Maui's dolphins will continue to decline. For example, an annual rate of decline of 3.0 percent per year (95 percent CI: −11 percent to +6 percent) and an annual survival rate of 84 percent (95 percent CI = 0.75–0.90) was estimated by Hamner et al. (2012b). Although this result was somewhat equivocal given the large confidence interval, a projected decline is supported by the trend analysis conducted by Wade et al. (2012) using six different abundance estimates generated from 1985 to 2011. Wade et al. (2012) calculated a statistically significant declining trend of −3.2 percent per year from 1985 to 2011 (90 percent CI = −5.7 percent to −0.6 percent, p = 0.029).

Given a population abundance of fewer than 100 dolphins over one year of age, evidence of a very large historical decline, and evidence of possible continued decline, this demographic risk category was rated as posing a ''very high risk'' for the subspecies.

B. Population Growth

Fecundity (*i.e.,* the number of female offspring per female per breeding season) of Maui's dolphins is relatively low (0.165 to 0.25, Secchi et al. 2004b), with females having calves every two to four years after reaching maturity at about 7 years of age (Slooten and Dawson 1994, Dawson 2009). Due to an estimated lifespan of only about 22 years, later maturity, and low fecundity, Maui's dolphins are considered to have a low intrinsic rate of population growth (Dawson 2009). The annual mortality rate is estimated to be about 17 percent per year for dolphins 1 year of age and older (Hamner et al. 2012b), and, as mentioned above, modelling results suggest a declining population trend (Wade et al. 2012). Overall, this demographic factor was found to constitute a ''high risk'' for Maui's dolphin.

C. Population Structure and Connectivity

Maui's dolphins are thought to have once ranged along the entire coast of the North Island (Russell 1999, Dawson et al. 2001b, Baker et al. 2002, Du Fresne 2010). The dolphins now occur only off the west coast of the North Island. While there is no indication of spatial structuring within the subspecies, data do indicate that home ranges of individuals are probably small (*e.g.* 35.5 km (SE= 4.03), Oremus et al. 2012), and that movements over 100 km are probably rare (Hamner et al. 2012b). Overall, the available information indicates that substantial range contraction has already occurred, gene flow will be limited among populations of Hector's dolphins that are over 100 km apart, and any fragmentation of the remaining population would be a serious concern. Overall, this demographic factor was rated as posing a ''moderate risk'' for Maui's dolphins.

D. Genetic Diversity

Genetic diversity in Maui's dolphins is currently very low. Pichler (2002) analyzed microsatellite DNA for Maui's dolphins across six loci (n = 4 to 12) and reported an average of 1.5 alleles per locus, three of which were fixed (*i.e.,* 1 allele), and an overall low heterozygosity (0.083 − 0.25). Analyses of contemporary mitochondrial DNA (mtDNA) samples also indicate a single maternal lineage (Pichler 2002, Hamner et al. 2012a). This level of haplotype diversity (*i.e., h* = 0) is well below the typical range of 0.70 − 0.92 for other more abundant odontocete species (Pichler and Baker 2000) and is only seen in several other rare marine mammals (*e.g.,* vaquita (*Phocoena sinus),* north Atlantic right whale *(Eubalaena glacialis),* Dawson et al. 2001b).

Maui's dolphins are reproductively isolated from SI Hector's dolphins, and there has been no recent gene flow between the subspecies (Pichler et al. 2001, Hamner et al. 2012a). Based on analyses of mtDNA, the North Island subspecies has been isolated from the South Island populations for up to 16,000 years (Pichler et al. 2001). Hamner et al. (2012a) noted that some degree of inbreeding is inevitable for such a small, isolated population and also suggested that the significant deviation from a 1:1 sex ratio they observed for stranded Maui's dolphins, due to an excess of females in their sample (41 females of 68 total Maui's dolphins), may be an indication of deleterious inbreeding effects.

Overall, Maui's dolphins have very low genetic diversity, are genetically isolated, and are vulnerable to inbreeding depression and the accumulation of deleterious mutations, which are serious concerns that can hasten the extinction of small populations (Lunch et al. 1995, Frankham 2005, O'Grady et al. 2006). This demographic factor was rated as a ''high risk'' for Maui's dolphins.

Demographic Risks Affecting Extinction Risk for SI Hector's Dolphins

In the sections below, we present information from Manning and Grantz (2016) on the demographic risks facing SI Hector's dolphins. As with Maui's dolphins, demographic risks to SI Hector's dolphins were considered according to the same four categories (abundance and trends, population growth/productivity, spatial structure/connectivity, and genetic diversity) and rated according to the same qualitative scale as defined above.

A. Abundance and Trends

Various surveys have been completed for portions of the SI Hector's dolphin's range, each producing a separate, regional abundance estimate for the associated portion of the subspecies' range. (See Manning and Grantz (2016) for discussion of older surveys and abundance estimates.) The most recent abundance estimate for the west coast of the South Island (WCSI) is based on aerial surveys conducted by Mackenzie and Clement (2016) in 2014/2015 from Farewell Spit south to Milford Sound. These surveys included substantial effort in waters beyond 4 nmi (7.4 km) from shore and included an ''outer'' survey zone between 12 nmi and 20 nmi from shore (22.2–37.0 km, MacKenzie and Clement 2016). Based on these surveys, summer and winter abundance estimates of 5,490 dolphins (95% CI = 3,319–9,079) and 5,802 dolphins (95%

CI = 3,879–8,679), respectively, were estimated using mark-recapture distance sampling after correcting for availability bias (or how ''available'' the dolphins are at or near the surface where they can be observed; Mackenzie and Clement 2016)). The most recent surveys of the north (NCSI) and east coasts (ECSI) of the South Island were conducted in the summer of 2012/2013 and winter 2013 and extended from Farewell Spit to Nugget Point and extended offshore to 20 nm (37.0 km; MacKenzie and Clement 2014). These intensive aerial surveys, which had a similar design as the WCSI surveys, produced an estimated summer abundance of 9,728 dolphins (95 percent CI= 7,001–13,517) and an estimated winter abundance of 8,208 dolphins (95 percent CI = 4,888–13,785, MacKenzie and Clement 2014, Mackenzie and Clement 2016). The most recent surveys of the SCSI produced an abundance estimate of 238 dolphins (95 percent CI = 113–503, Clement et al. 2011, Mackenzie and Clement 2016). This abundance estimate was based on two aerial surveys completed in March and August 2010 from Puysegur Point to Nugget Point and extended out to the 100-m depth contour (Clement et al. 2011). Following completion of the last of these three regional survey efforts, Mackenzie and Clement (2016) re-analyzed the data and, using the sum of the averages of the summer and winter abundance estimates from these surveys, calculated a total population estimate of 14,849 SI Hector's dolphins (95% CI = 11,923–18,492).

Despite the large confidence intervals associated with some of these recent abundance estimates, the data indicate that the total abundance of SI Hector's dolphins is greater than commonly applied theoretical abundances used as indicators of a high risk of extinction—*e.g.,* 2,500 total individuals (Allendorf et al. 1987) and 1,000 mature individuals (Mace et al. 2008)—suggesting that SI Hector's dolphins are not at high risk of extinction due to abundance alone.

Populations of SI Hector's dolphins have, however, experienced substantial declines and available information suggests that the subspecies is likely to continue declining (Slooten and Lad 1991, Slooten et al. 1992, Burkhart and Slooten 2003). SI Hector's dolphin populations are estimated to have experienced declines of 20–73 percent since the 1970s following the expansion of commercial gillnetting in New Zealand (Slooten 2007, Davies et al. 2008, Slooten and Dawson 2010). Evidence of a historical decline is also provided by the findings of Pichler and Baker (2000), who detected a significant decline in mtDNA diversity (from h = 0.65 to h = 0.35, $p<0.05$) for ECSI Hector's dolphins in a comparison of contemporary (n=108) samples to historical samples (n=55) dating back to 1870. These authors suggest that the high rate of decline in mitochondrial DNA diversity reflects a high rate of population decline driven by unsustainable levels of bycatch mortality. While there is strong evidence that adult survival in the ECSI population has improved following the implementation of fishing restrictions at BPMMS (0.863 (95 percent CI = 0.647–0.971) pre-sanctuary versus 0.917 (95 percent CI = 0.802–0.984) post-sanctuary), the improved survival rate still corresponds to an estimated decline of 0.5 percent per year (Gormley et al. 2012). Results of modelling efforts by Slooten and Davies (2012) also suggest continued population declines over the next 50 years if fisheries management practices remain the same.

Overall, this demographic factor was rated as posing a ''moderate risk'' for SI Hector's dolphins.

B. Population Growth

Given an estimated lifespan of about 22 years, relatively late maturity (at 7–9 years), and low fecundity (0.165 to 0.25), Hector's dolphins are considered to have a low intrinsic population growth rate (Slooten 1991, Slooten and Lad 1991, Secchi and Fletcher 2004, Secchi et al. 2004b, Dawson 2009). Females may produce only four to seven calves over their lifetime. Estimates of the survival rate of SI Hector's dolphins ≥ 1 year old have ranged from 0.77 to 0.89 (Slooten and Lad 1991, Slooten et al. 1992, Slooten and Dawson 1994, Cameron et al. 1999). Based on simple Leslie matrix models, Slooten and Ladd (1991) estimated a maximum population growth rate of 0.018 to 0.049; whereas, Secchi and Fletcher (2004) estimated a much lower population growth rate of 0.0065. Projections of population growth, given estimated levels of human-caused mortality, have varied depending on the modelling approach and the study population, but results are generally consistent in indicating a continuing population decline (Slooten and Dawson 2010, Slooten and Davies 2012). Essentially, the available information indicates that population growth is too low to compensate for current mortality rates, and that mortality needs to be reduced in order to allow populations around the South Island to recover from past declines due to bycatch (Slooten 2013).

This demographic factor was rated as posing a ''moderate risk'' for SI Hector's dolphins.

C. Population Structure and Connectivity

Analyses of both mtDNA and microsatellite DNA indicate the existence of three distinct regional populations of SI Hector's dolphins—east, west, and south coast populations (Pichler et al. 1998, Pichler 2002, Hamner et al. 2012a). Each regional population is characterized by one or two high frequency mtDNA haplotypes, and hierarchical analyses of both mtDNA and microsatellite DNA data indicate strong genetic differentiation among the three regional populations (mtDNA F_{ST} = 0.321, $p<0.001$; Phi $_{ST}$ = 0.395; microsatellite F_{ST} = 0.058, $p<0.001$; Hamner et al. 2012a). There appears to be additional genetic structuring on the south coast, as samples from Te Wæwæ Bay and Toetoe Bay, locations separated by only about 100 km of coastline, were significantly differentiated based on both mtDNA (F_{ST} = 0.136, p = 0.03) and microsatellite DNA (F_{ST} = 0.043, p = 0.005). Fine-scale population structuring has also recently been detected in ECSI Hector's dolphins sampled from adjacent populations on either side of Kaikoura Canyon (Hamner et al. 2016). Analysis of both mtDNA (F_{ST} = 0.081, $p<0.001$) and microsatellite DNA (F_{ST} = 0.013, $p<0.001$) indicated a low but statistically significant level of genetic differentiation between these adjacent populations (Hamner et al. 2016).

Estimated migration rates for males and females among the three main regional populations are low and appear to be asymmetrical (Pichler 2002, Hamner et al. 2012a). Based on mtDNA, Pichler (2002) estimated long-term migration rates of less than one female per generation among regions, except between the west and south coasts where female migration rates were estimated to be between 2.7 and 3.7 female migrants per generation. Based on analyses of both mtDNA and microsatellite DNA, there also appears to be a low level of male-mediated gene flow, with the highest exchange appearing to occur from the south coast to the east coast (Hamner et al. 2012a). Analysis of levels of genetic differentiation among sample locations within regions suggests a ''stepping-stone'' model of gene flow in which there are low levels of migration between neighboring populations over distances shorter than 100 km and much more limited gene flow among the three larger regional populations (Pichler 2002; Hamner et al. 2012a). Hamner et al. (2012a) concluded that very rare migration events are facilitating gene

flow across the roughly 100–370 km distances separating the three larger regions. Overall, these findings are consistent with *a priori* expectations of low gene flow over larger spatial scales given the small estimated home ranges (typically 30 km–60 km) and high degree of site fidelity observed in SI Hector's dolphins (Bejder and Dawson 2001, Bräger et al. 2002, Rayment et al. 2009a). Although longer-range movements (> 400 km) of SI Hector's dolphins do appear to occur, at least on occasion, there is as yet no indication that such movements are associated with mating (Hamner et al. 2012b, Hamner et al. 2014a).

How the existing population structure and connectivity of SI Hector's dolphin populations influence extinction risk is unclear. The current distribution of SI Hector's dolphins as multiple populations with a low level of connectivity could potentially provide protection from local extirpation (for example, by a catastrophic event) while allowing for local adaptation, which could ultimately benefit long-term survival (Franklin 1980). Alternatively, restricted and asymmetrical dispersal among populations may mean there is very limited potential for one population to buffer against the loss of another local population and prevent further fragmentation (Pichler et al. 1998, Pichler 2001). The ongoing human-caused mortality and the slow population growth rate of SI Hector's dolphins are factors that favor this latter interpretation.

Overall, this demographic factor was rated as posing a ''moderate risk'' to SI Hector's dolphins.

D. Genetic Diversity

Relative to other abundant dolphin species, genetic diversity of SI Hector's dolphins is low (Pichler and Baker 2000; Pichler 2002). Pichler and Baker (2000) reported haplotype (h) and nucleotide (π) diversity estimates of 0.35 and 0.0030, respectively, for ECSI Hector's dolphins (n = 46) and 0.66 and 0.0040 for WCSI Hector's dolphins (n = 47), which are low compared to previously reported estimates for other, more abundant odontocetes (*e.g.,* h = 0.70–0.92 and $\pi > 0.01$). Diversity estimates based on mtDNA analyses by Hamner et al. (2012a) were somewhat higher for both the ECSI (h = 0.51, π = 0.0039) and WCSI (h = 0.72, π = 0.0049, n = 154) populations, possibly as a consequence of larger sample sizes, but they are still relatively low. The low genetic diversity observed may reflect restricted gene flow among populations and a consequent increase in genetic drift within populations.

As noted above, analysis of mtDNA samples for ECSI Hector's dolphins by Pichler and Baker (2000) indicated a significant decline in mitochondrial diversity between historical samples from 1870–1987 (h = 0.65 and π = 0.0084, n = 36) and more contemporary samples from 1988–1998 (h = 0.35 and π = 0.0030, n = 46). A trend analysis of mtDNA diversity also indicated full loss of diversity within the next 20 years (Pichler and Baker 2000).

Guidelines commonly cited and applied in conservation biology are that, in a finite population and ignoring other ecological considerations, a minimum effective population size of at least 50 individuals is required to prevent the harmful effects of inbreeding, and an effective population size of at least 500 individuals is required to prevent the accumulation of deleterious recessive alleles and maintain genetic diversity over hundreds of years (Franklin 1980, Soulé 1980, Gilpin and Soulé 1986, Allendorf et al. 1987). Other theoretical analyses, however, suggests that these thresholds are too low and that well over 1,000 breeding adults per generation may instead be necessary to avoid extinction by ''mutational meltdown'' over time periods of 100 or more generations (Lynch et al. 1995). Given that effective population size is often about ⅕ to ⅓ of a population's total size (Frankham 1995), a conservative estimate of the effective population size for SI Hector's dolphins could be roughly estimated as 2,385 to 3,698 dolphins (calculated using ⅕ of the 95 percent CI abundance estimates). Because these rough estimates are well above the thresholds of 50, 500, and 1,000 associated with inbreeding, loss of genetic diversity, and mutational meltdown, we conclude that the SI Hector's dolphin is not at high risk of extinction in the near-term due to its current genetic health.

Given the evidence of low and potentially declining genetic diversity, this demographic factor was rated as being a ''moderate risk.''

Protective Efforts

In addition to the regulatory measures discussed above (*e.g.* fishing and boating regulations, sanctuary designations), we considered other efforts being made to protect Hector's dolphins. We considered whether such protective efforts, as summarized below, alter our findings regarding the status of Maui's and Hector's dolphins.

To help raise awareness and educate boaters about the regulations governing the operation of vessels around marine mammals, the DOC recently initated the 'Sustainable Marine Mammal Actions in Recreation and Tourism'—or SMART program. Commercial operators who participate in the training course through this program are labelled 'SMART operators' and are promoted to tourists as such. A training course for recreational boaters is also available. While this proactive program has likely improved boater awareness and on-the-water behavior to some degree, we have no data to evaluate the extent to which boater-associated impacts on Hector's dolphins have been reduced, and the available information indicates that dolphin-watching and 'swim-with' activities are not benign activities even when conducted according to the existing regulations.

To help minimize fisheries interactions and bycatch, some voluntary practices have been used in some areas around the South Island since 2002. These measures include deployment of pingers and other modifications to fishing activities. However, the extent to which such voluntary measures are being implemented is unclear, and the efficacy of pingers in reducing bycatch of Hector's dolphins has not yet been clearly established (Dawson 1998, Stone et al. 2000b). The MPI also established a hotline for reporting violations of fishing restrictions; however, there are no data available to evaluate whether the hotline has contributed to improved enforcement or compliance with existing fishing regulations.

Although these efforts may be providing measurable protection for Hector's dolphins, there is no indication that these efforts are ameliorating threats, particularly the threats of bycatch and disease, such that the extinction risk of either subspecies is reduced. Therefore, we conclude that these protective efforts do not alter the extinction risk for either Maui's or SI Hector's dolphins. We are not aware of any other conservation measures for these subspecies and are soliciting additional information on any relevant conservation efforts through the public comment process on this proposed rule (see Public Comments Solicited below).

Proposed Listing Determinations

Maui's dolphins are currently at critically low abundance, and face additional demographic risks due to greatly reduced genetic diversity and a low population growth rate. Past declines, on the order of about 90 percent, have been driven largely by bycatch in gillnets. Maui's dolphins continue to face threats of bycatch, disease, and mining and seismic disturbances; and available evidence suggests the population will continue to

decline despite existing management protections. We conclude that Maui's dolphin is currently facing a high risk of extinction throughout its range and is likely to become extinct. Therefore, we find that this subspecies meets the definition of an endangered species under the ESA. This conclusion is consistent with previous risk assessments for Maui's dolphin, which have concluded this subspecies is facing an extremely high risk of extinction in the wild and will recover only if sources of anthropogenic mortality are eliminated (Slooten et al. 2006; MFish and DOC 2007b, Baker et al. 2010). Concern over abundance and trends for Maui's dolphin has previously led to its classification as ''nationally critical'' under the New Zealand Threat Classification System, which is the most threatened status within this classification system (Baker et al. 2010).

Under the New Zealand Threat Classification System, the SI Hector's dolphin has been formally classified as ''nationally endangered,'' which is the second-most threatened status within this classification system (Baker et al. 2010). The qualifier ''conservation dependent'' is also applied to SI Hector's dolphins, meaning that the subspecies is likely to move to the higher category of ''nationally critical'' if current management were to cease (Townsend et al. 2008, Baker et al. 2010).

Our review of the best available data indicates that the SI Hector's dolphin has experienced substantial population declines since the 1970s, has relatively low genetic diversity, a low intrinsic population growth rate, and a fragmented population structure. Although historical data are lacking, Slooten (2007a) estimated that the SI Hector's dolphin population has declined by about 73 percent between 1970 and 2007, and available population viability analyses indicate that the SI Hector's dolphin is likely to continue to decline unless bycatch mortality is reduced (Davies et al. 2008, Slooten and Davies 2012, Slooten 2013). Gormley et al. (2012) estimated that the Banks Peninsula population, which has benefited from almost three decades of protection, would continue to decline at a rate of about 0.5 percent per year despite significantly improved survival rates. Assuming an existing population abundance of about 14,849 dolphins (95 percent CI = 11,923–18,492), a constant rate of decline of 0.5 percent per year for the subspecies as a whole could result in a 50 percent decline in the population in about 138 years and an 80 percent decline in about 321 years. These are simply estimates based on the limited data available, however, and they do not establish any specific thresholds for determining when the subspecies may be in danger of extinction throughout all or a significant portion of its range. The actual rate of decline of the subspecies remains unclear given the very limited bycatch mortality data available. A trend analysis based on survey data is also confounded by the fact that surveys have covered different portions of the range and have dramatically increased in sophistication and geographical scope over time. Thus, a precise analysis of the rate of decline and projection of time to extinction given multiple threats and demographic considerations is not currently possible.

Current levels of bycatch are contributing to the decline of this subspecies (Slooten and Davies 2012). Additional, lesser threats, such as disease and tourism impacts, are likely exacerbating the rate of decline and thereby contributing to the overall extinction risk of this subspecies. Given recent abundance estimates for the total population and evidence of a slowed rate of decline following expanded fisheries management measures, we find that this subspecies is not facing an imminent risk of extinction. However, historical declines and the projected decline for most populations, combined with a low population growth rate, low genetic diversity, limited population connectivity, and the ongoing threats of bycatch, disease, and tourism, provide a strong indication that this subspecies is likely to become an endangered species within the foreseeable future assuming a status quo in conservation. We therefore propose to list this subspecies as threatened under the ESA.

Effects of Listing

Conservation measures provided for species listed as endangered or threatened under the ESA include the development and implementation of recovery plans (16 U.S.C. 1533(f)); designation of critical habitat, if prudent and determinable (16 U.S.C. 1533(a)(3)(A)); a requirement that Federal agencies consult with NMFS under section 7 of the ESA to ensure their actions do not jeopardize the species or result in adverse modification or destruction of designated critical habitat (16 U.S.C. 1536); and prohibitions on ''taking'' (16 U.S.C. 1538). The prohibitions on ''take,'' including export and import, automatically apply to species listed as endangered. Prohibitions on take do not apply to species listed as threatened unless protective regulations are issued under section 4(d) of the ESA (16 U.S.C. 1533(d)). In the case of threatened species, section 4(d) of the ESA leaves it to the Secretary's discretion whether, and to what extent, to extend take prohibitions to the species. Section 4(d) protective regulations may prohibit, with respect to threatened species, some or all of the acts which section 9(a) of the ESA prohibits with respect to endangered species. We are not proposing such regulations at this time but may consider potential protective regulations pursuant to section 4(d) for the SI Hector's dolphin in a future rulemaking.

Recognition of the species' imperiled status through listing may also promote conservation actions by Federal and state agencies, foreign entities, private groups, and individuals.

Activities That Would Constitute a Violation of Section 9 of the ESA

On July 1, 1994, NMFS and the U.S. Fish and Wildlife Service (USFWS) published a policy (59 FR 34272) that requires us to identify, to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the ESA. The intent of this policy is to increase public awareness of the potential effects of species listings on proposed and ongoing activities.

If the Maui's dolphin is listed as endangered, all of the prohibitions of section 9(a)(1) of the ESA will apply to this subspecies. Section 9(a)(1) includes prohibitions against the import, export, use in foreign commerce, and ''take'' of the listed species. These prohibitions apply to all persons subject to the jurisdiction of the United States, including in the United States, its territorial sea, or on the high seas. Take is defined as ''to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.'' Activities that could result in a violation of section 9 prohibitions for Maui's dolphins include, but are not limited to, the following:

(1) Delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce any individual or part, in the course of a commercial activity;

(2) Selling or offering for sale in interstate commerce any part, except antique articles at least 100 years old; and

(3) Importing or exporting Maui's dolphins or any parts of these dolphins.

Whether a violation results from a particular activity is entirely dependent upon the facts and circumstances of each incident. Further, an activity not

listed here may in fact constitute a violation.

Section 7 Conference and Consultation Requirements

Section 7(a)(2) (16 U.S.C. 1536(a)(2)) of the ESA and joint NMFS/USFWS regulations require Federal agencies to consult with NMFS to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Section 7(a)(4) (16 U.S.C. 1536(a)(4)) of the ESA and NMFS/USFWS regulations also require Federal agencies to confer with us on actions likely to jeopardize the continued existence of species proposed for listing, or that are likely to result in the destruction or adverse modification of proposed critical habitat of those species. It is unlikely that the listing of these subspecies under the ESA will increase the number of section 7 consultations, because these subspecies occur outside of the United States and are unlikely to be affected by Federal actions.

Critical Habitat

Critical habitat is defined in section 3 of the ESA (16 U.S.C. 1532(5)) as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed if such areas are determined to be essential for the conservation of the species. Section 4(a)(3)(A) of the ESA (16 U.S.C. 1533(a)(3)(A)) requires that, to the extent prudent and determinable, critical habitat be designated concurrently with the listing of a species. However, critical habitat cannot be designated in foreign countries or other areas outside U.S. jurisdiction (50 CFR 424.12(g)). Maui's and SI Hector's dolphins are endemic to New Zealand and do not occur within areas under U.S. jurisdiction. There is no basis to conclude that any unoccupied areas under U.S. jurisdiction are essential for the conservation of either subspecies. Therefore, we do not intend to propose any critical habitat designations for either subspecies.

Public Comments Solicited

We must base our final listing determination on the best scientific and commercial data available. We cannot consider the economic effects of a listing determination. To help ensure that any final action resulting from this proposed rule will be accurate and based on the best available data, we are soliciting comments from the public, other concerned governmental agencies, the scientific community, industry, and any other interested parties on the draft status review report and proposed rule. See **DATES** and **ADDRESSES** for information on how to submit comments.

Promulgation of any final regulation to list these subspecies will take into consideration the comments and any additional data we receive during the comment period, and this process may lead to a final regulation that differs from this proposal. We are especially seeking information regarding the following topics:

(1) New or updated data regarding threats to Maui's and SI Hector's dolphins, especially bycatch rates in commercial and recreational fisheries, bycatch in fishing gear types other than gillnets, compliance with fishing regulations, and trends in disease prevalence;

(2) New or updated population viability analyses that reflect the most recent abundance estimates for the subspecies;

(3) Current or planned activities within the range of these subspecies and their possible impacts on these species; and,

(4) Conservation efforts that are addressing threats to either subspecies.

We request that all information be accompanied by: (1) Supporting documentation, such as maps, bibliographic references, or reprints of pertinent publications; and (2) the submitter's name, address, and any association, institution, or business that the person represents.

Peer Review

In December 2004, the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review establishing a minimum peer review standard. We solicited peer review comments on the draft status review report (Manning and Gantz 2016) from three scientists with expertise on Hector's dolphins. We received and reviewed comments from these scientists, and their comments are incorporated into the draft status review report and this proposed rule. Their comments on the status review are summarized in the peer review report and available at *www.cio.noaa.gov/services_programs/prplans/PRsummaries.html.*

References

A complete list of the references used in this proposed rule is available upon request (see **ADDRESSES**).

Classification

National Environmental Policy Act

Section 4(b)(1)(A) of the ESA restricts the information that may be considered when assessing species for listing and sets the basis upon which listing determinations must be made. Based on the requirements in section 4(b)(1)(A) of the ESA and the opinion in *Pacific Legal Foundation* v. *Andrus,* 675 F. 2d 825 (6th Cir. 1981), we have concluded that ESA listing actions are not subject to the environmental assessment requirements of the National Environmental Policy Act (NEPA).

Executive Order 12866, Regulatory Flexibility Act, and Paperwork Reduction Act

As noted in the Conference Report on the 1982 amendments to the ESA, economic impacts cannot be considered when assessing the status of a species. Therefore, the economic analysis requirements of the Regulatory Flexibility Act are not applicable to the listing process.

In addition, this proposed rule is exempt from review under Executive Order 12866. This proposed rule does not contain a collection-of-information requirement for the purposes of the Paperwork Reduction Act.

Executive Order 13132, Federalism

In accordance with E.O. 13132, we determined that this proposed rule does not have significant federalism effects and that a federalism assessment is not required. In keeping with the intent of the Administration and Congress to provide continuing and meaningful dialogue on issues of mutual state and Federal interest, this proposed rule will be given to the relevant governmental agencies in New Zealand, and they will be invited to comment. We will confer with the U.S. Department of State to ensure appropriate notice is given to New Zealand. As the process continues, we intend to continue engaging in informal and formal contact with the U.S. State Department, giving careful consideration to all written and oral comments received.

List of Subjects

50 CFR Part 223

Endangered and threatened species, Exports, Transportation.

50 CFR Part 224

Endangered and threatened species, Exports, Imports, Transportation.

Dated: September 13, 2016.

Samuel D. Rauch, III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

For the reasons set out in the preamble, we propose to amend 50 CFR parts 223 and 224 as follows:

PART 223—THREATENED MARINE AND ANADROMOUS SPECIES

■ 1. The authority citation for part 223 continues to read as follows:

Authority: 16 U.S.C. 1531–1543; subpart B, § 223.201–202 also issued under 16 U.S.C. 1361 *et seq.;* 16 U.S.C. 5503(d) for § 223.206(d)(9).

■ 2. In § 223.102, amend the table in paragraph (e) by adding an entry under ''Marine Mammals'' in alphabetical order, by common name, to read as follows:

§ 223.102 Enumeration of threatened marine and anadromous species.

* * * * *

(e) * * *

Species [1]			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
Marine Mammals					
Dolphin, Hector's	*Cephalorhynchus hectori hectori.*	Entire subspecies	[**Federal Register** Citation and Date When Published as a Final Rule].	NA	NA
*	*	*	*	*	*

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

* * * * *

PART 224—ENDANGERED MARINE AND ANADROMOUS SPECIES

■ 3. The authority citation for part 224 continues to read as follows:

Authority: 16 U.S.C. 1531–1543 and 16 U.S.C 1361 *et seq.*

■ 4. In § 224.101, amend the table in paragraph (h) by adding an entry under ''Marine Mammals'' in alphabetical order, by common name, to read as follows:

§ 224.101 Enumeration of endangered marine and anadromous species.

* * * * *

(h) * * *

Species [1]			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
Marine Mammals					
*	*	*	*	*	*
Dolphin, Maui's	*Cephalorhynchus hectori maui.*	Entire subspecies	[**Federal Register** Citation and Date When Published as a Final Rule].	NA	NA
*	*	*	*	*	*

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

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