§101.147 [Corrected]

On page 41771, in §101.147, in the third column, the tables are corrected to read as set forth below:

* * * * *

(s) * * *

Transmit (receive) (MHz)	Receive (transmit) (MHz)
(3) 10 MHz bandwidth channels:	
* * *	* *
22025 [2]	23225 [2]
* * *	* *
22075 [2]	23275 [2]
* * *	* *

* * * * *

Transmit (receive) (MHz)	Receive (transmit) (MHz)
(7) 50 MHz bandwidth channels:	
* * *	* *
22025 [2]	23225 [2]
22075 [2]	23275 [2]
* * *	* *

[2] These frequencies may be assigned to low power systems, as defined in paragraph (8) of this section.

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[FR Doc. C1–2010–17205 Filed 8–2–10; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R9-IA-2008-0118] [MO 92210-0-0010-B6]

RIN 1018–AW40

Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Five Penguin Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine threatened status for five penguins: The yellow-eyed penguin (*Megadyptes antipodes*), white-flippered penguin (*Eudyptula minor albosignata*), Fiordland crested penguin (*Eudyptes pachyrhynchus*), Humboldt penguin (*Spheniscus humboldti*), and erect-crested penguin (*Eudyptes sclateri*) under the Endangered Species Act of 1973, as amended (Act).

DATES: This rule becomes effective September 2, 2010.

ADDRESSES: This final rule is available on the Internet at *http://www.regulations.gov. Comments and materials received, as well as supporting* documentation used in the preparation of this rule, will be available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Suite 420, Arlington, VA 22203.

FOR FURTHER INFORMATION CONTACT: Janine Van Norman, Chief, Branch of Foreign Species, Endangered Species Program, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 420, Arlington, VA 22203; telephone 703-358-2171; facsimile 703-358-1735. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

SUPPLEMENTARY INFORMATION:

Background

On December 18, 2008, we published a proposed rule (73 FR 77303) to list the yellow-eyed penguin (*Megadyptes antipodes*), white-flippered penguin (*Eudyptula minor albosignata*), Fiordland crested penguin (*Eudyptes pachyrhynchus*), Humboldt penguin (*Spheniscus humboldti*), and erect-crested penguin (*Eudyptes sclateri*) under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*). That document also served as the 12–month finding on a petition to list these species, which are 5 of 12 penguin species included in the petition. We opened the public comment period on the proposed rule for 60 days, ending February 17, 2009, to allow all interested parties an opportunity to comment on the proposed rule. On March 9, 2010, the Center for Biological Diversity (CBD) filed a complaint (CV-10-992, N.D. Cal) for failure to issue a final listing determination within 12 months of the proposal to list the species. In a court-approved settlement agreement, the Service agreed to submit a final rule to the **Federal Register** by July 30, 2010.

Previous Federal Action

For a detailed history of previous Federal actions involving these five penguin species, please see the Service's proposed listing rule, which published in the **Federal Register** on December 18, 2008 (73 FR 77303).

Summary of Comments and Recommendations

In the proposed rule published on December 18, 2008 (73 FR 77303), we requested that all interested parties submit information that might contribute to development of a final rule. We also contacted appropriate scientific experts and organizations and invited them to comment on the proposed listings. We received 13 comments: 4 from members of the public, and 9 from peer reviewers.

We reviewed all comments received from the public and peer reviewers for substantive issues and new information regarding the proposed listing of these five species, and we have addressed those comments below. Overall, the commenters and peer reviewers supported the proposed listings. One comment from the public included substantive information; other comments simply supported the proposed listing without providing scientific or commercial data.

Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we requested expert opinions from 14 knowledgeable peer reviewers with scientific expertise that included familiarity with the species, the geographic region in which the species occur, and conservation biology principles. We received responses from nine of the peer reviewers. They generally agreed that the description of the biology and habitat for each species was accurate and based on the best available information. They provided some new or additional information on the biology and habitat of some of these penguin species and their threats, and we incorporated that information into the rulemaking as appropriate. In some cases, it has been indicated in the citations by "personal communication," which could indicate either an email or telephone conversation, while in other cases the research citation is provided.

Peer Reviewer Comments

(1) Comment: Several peer reviewers provided new data and information regarding the biology, ecology, life history, population estimates, and threat factors affecting these penguin species, and requested that we incorporate the new data and information into this final rule and consider it in making our listing determination. With respect to potential threats, one peer reviewer raised the issue of flipper banding of the yellow-eyed penguin. Several peer reviewers provided clarifying information on predation with respect to the Humboldt and white-flippered penguins. Additionally, some of the peer reviewers provided technical corrections and brought to our attention recent papers discussing taxonomy and genetics.

Our Response: In addition to the critical review provided by species experts, we considered scientific and commercial information regarding these penguin species contained in technical documents, published journal articles, and other general literature documents, including over 30 documents we reviewed since the publication of the proposed rule to list these 5 penguin species. We have incorporated the new information and technical corrections into this final rule. In addition, we address flipper banding of the yellow-eyed penguin, and information on predation of the Humboldt and white-flippered penguins in the threats analyses for those species in this final rule.

(2) Comment: One peer reviewer suggested that the mainland and sub-Antarctic populations of yellow-eyed penguins should be considered separate management units, stating that there was negligible genetic interchange between populations. The peer reviewer cited information from 1989, and indicated that more recent work was in review, although no researcher or paper was cited.

Our Response: We reviewed the best available information, including two papers on the genetics of yellow-eyed penguin published in 2008 and 2009, and found no basis to amend our initial finding. The 2008 and 2009 papers support our finding that the species should be listed as threatened throughout its range. Additional discussion is found later in this document under yellow-eyed penguin.

(3) Comment: One peer reviewer raised the issue that the taxonomy of the white-flippered penguin has long been in debate.

Our Response: We reviewed the best available information regarding the taxonomy of white-flippered penguin (*Eudyptula minor albosignata*), and we found no basis to amend our taxonomic treatment of the species. See the background section below on white-flippered penguin for additional discussion.

Public Comments

(4) Comment: One commenter provided additional information regarding potential threat factors affecting these five species, and requested that we consider the information and incorporate it into the listing determinations. Specifically, the commenter indicated that the Service failed to address anthropogenic climate change and how it will affect penguins, particularly the Humboldt penguin. The commenter also requested that we address the issue of accelerated ocean warming and ocean acidification. The commenter suggested that the pH (acidity) of the ocean is rapidly changing, and may lower by 0.3 to 0.4 units by the year 2100, which would mean the acidity would increase by 100 to 150 percent. The commenter cited Orr *et al*. 2005 and Meehl *et al*. 2007.

Our Response: We thank the commenter who provided this information for our consideration in making this final listing determination. We will first respond to the comment that greenhouse gas emissions will accelerate ocean warming and increase sea level rise. Gille (2002, p. 1276) found that while ocean warming occurred in the 1950s and 1960s, it leveled off in the 1980s and 1990s; overall, there was an increase in ocean water temperature in the Southern Hemisphere over the past 50 years. Looking forward to years 2090-2099, precipitation is predicted to increase across the sub-Antarctic and Antarctic region, with a greater than 20 percent increase predicted for the Antarctic continent (IPCC 2007, p. 10). We acknowledge that ocean warming and sea level rise may occur. Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level ((IPCC 2007, p. 30). During the status review, we carefully evaluated threats facing these species. We considered the various threats in part based on their severity. In some cases, the effects of climate change are unpredictable and understudied, and the best available information does not indicate how increased sea level rise and ocean warming may affect these five penguin species. However, we determined what major stressors are affecting the status of the species, and evaluated those stressors based on the best available scientific and commercial information

Secondly, we acknowledge that the issue of ocean acidification was not directly addressed in the proposed rule. Again, with respect to penguins, the best available information does not address how ocean acidity would impact the physiology and food web associated with these five penguin species. We acknowledge that ocean acidification may be a concern, but at this time, any conclusion would be purely speculative regarding how much the oceanic pH may change in the penguins' habitat and how the other changes in the species' environments would interact with other known threats. The manner in which a change in ocean pH may affect penguins is currently unpredictable.

(5) Comment: The same commenter requested that the Service consider listing these five species as endangered instead of threatened based on the two issues noted above.

Our Response: Section 4(b)(1)(A) of the Act requires us to make listing decisions based solely on the best scientific and commercial data available. We have thoroughly reviewed all available scientific and commercial data for these species in preparing this final listing determination. We reviewed historical and recent publications, as well as unpublished reports, concerning these species. In addition, we used peer review to provide a more focused, independent examination of the available scientific information and its application to the current status of the species. As part of our evaluation, we carefully considered the quality and reliability of all data to decide which constitutes the best available data for our consideration in making our final determination. We analyzed the threats in making our determination, and our review of the threat factors indicate that listing these five species as threatened is warranted. After reviewing the peer review and public comments we received, we have no reason to alter our assessment. Based on our analysis, we determined that none of these five penguin species is currently in danger of extinction throughout its entire range, and therefore none of them meet the definition of endangered under the Act (16 U.S.C. 1532(6)).

Summary of Changes from Proposed Rule

We fully considered comments from the public and peer reviewers on the proposed rule to develop this final listing of five foreign penguin species. This final rule incorporates changes to our proposed listing based on the comments that we received that are discussed above and newly available scientific and commercial information. Reviewers generally commented that the proposed rule was very thorough and comprehensive. We made some technical corrections based on new, although limited, information. None of the information, however, changed our determination that listing these five species as threatened is warranted.

Species Information and Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act. The five factors are: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; and (E) other natural or manmade factors affecting its continued existence.

Below is a species-by-species threats analysis of these five factors. The species are considered in the following order: Yellow-eyed penguin, white-flippered penguin, Fiordland crested penguin, Humboldt penguin, and erect-crested penguin.

Yellow-eyed Penguin (*Megadyptes antipodes*)

Background

The yellow-eyed penguin, also known by its Maori name, hoiho, is the third largest of all penguin species, averaging around 18 pounds (lb) (8 kilograms (kg)) in weight, the males averaging 1 kg more than females at 8.5 kg. It is the only species in the monotypic genus *Megadyptes* (Boessenkool *et al.* 2009, p. 819). Yellow-eyed penguins breed on the southeast coast of New Zealand's South Island, from Banks Peninsula to Bluff at the southern tip; in Fouveaux Strait, and on Stewart and adjacent islands just 18.75 mi (30 km) from the southern tip of the New Zealand mainland; and at the sub-Antarctic Auckland and Campbell Islands, 300 mi (480 km) and 380 mi (608 km), respectively, south of the southern tip of the South Island. The distribution is thought to have moved north since the 1950s (McKinlay 2001, p. 8). The species is confined to the seas of the New Zealand region and forages over the continental shelf (Taylor 2000, p. 93).

Unlike more strongly colonial breeding penguin species, yellow-eyed penguins nest in relative seclusion, out of sight of humans and one another (Ratz and Thompson 1999, p. 205; Seddon and Davis 1989, pp. 653-659; Wright 1998, pp. 9–10). Current terrestrial habitats range from native forest to grazed pasture (McKinlay 2001, p. 10). In some places, they nest in restored areas, and in other places, they nest in areas where livestock are still present (McKinlay 2001, p. 10). Prior to land clearing for agriculture by European settlers, the historic habitat was in coastal forests and shrub margins (Marchant and Higgins 1990, p. 237).

In 2001, the New Zealand Department of Conservation (NZDOC) published the Hoiho (*Megadyptes antipodes)* Recovery Plan (2000–2025) to state the NZDOC's intentions for the conservation of this species, to guide the NZDOC in its allocation of resources, and to promote discussion among the interested public (McKinlay 2001, p. 20). The goal of the Recovery Plan, which updates a 1985–1997 plan previously in place, is to increase yellow-eyed penguin numbers and have active community involvement in their conservation. The primary emphasis over the 25–year period is to "retain, manage and create terrestrial habitat" and to "investigate the mortality of hoiho at sea" (McKinlay 2001, p. 2).

In 2007, the total population estimate was 1,600 breeding pairs (3,200 breeding adults in the population) (Houston 2007, p. 3). As of 2009, the total estimate for this species is 7,000 individuals (Boessenkool *et al*. 2009, p. 815), which is not substantially different from the 2007 estimate.

In the recent past, the number of breeding pairs has undergone dramatic periods of decline and fluctuation in parts of its range on the mainland of the South Island. Records suggest that the mainland populations declined by at least 75 percent from the 1940s to 1988. In 1988, there were 380 to 400 breeding pairs (Darby and Seddon 1990, p. 59). There have been large fluctuations since a low of about 100 breeding pairs in the 1989–90 breeding season to over 600 in the 1995–96 breeding season (McKinlay 2001, p. 10). Current mainland counts indicate 450 breeding pairs on the southeast coast of the mainland of the South Island (Houston 2007, p. 3). As recently as the 1940s, there were reported to be individual breeding areas where penguin numbers were estimated in the hundreds; in 1988, only 3 breeding areas on the whole of the South Island had more than 30 breeding pairs (Darby and Seddon 1990, p. 59).

Just across the Fouveaux Strait at the southern tip of the South Island, at Stewart Island and nearby Codfish Island, yellow-eyed penguin populations numbered a combined estimate of 178 breeding pairs in the early 2000s (Massaro and Blair 2003, p. 110). While these populations are essentially contiguous with the mainland range, this is the first population estimate for this area based on a comprehensive count. This estimate, while lower than previous estimates, may be lower because when the population estimates were done in the 1980s and 1990s, they were partial surveys rather than full surveys. It is unclear whether numbers have declined in the past two decades or whether previous estimates, which extrapolated from partial surveys, were overestimates (Massaro and Blair 2003, p. 110), but evidence points to the latter. For example, Darby and Seddon (1990, p. 58) provided 1988 estimates of 470 to 600 breeding pairs at Stewart Island and nearby Codfish Island, which the researchers extrapolated from density estimates. In the Hoiho Recovery Plan, which reported these 1988 numbers, it is noted that, "In the case of Stewart Island, these figures should be treated with a great deal of skepticism. Only a partial survey was completed in the early 1990s" (McKinlay 2001, p. 8). Darby (2003, p. 148), one of the authors of the 1988 estimate, subsequently reviewed survey data from the decade between 1984 and 1994 and revised the estimates for this region down to 220 to 400 pairs. Houston (2008, p. 1) reported numbers are stable in all areas of Stewart and Codfish Islands, except in the northeast region of Stewart Island where disease and starvation are impacting colonies, as discussed in detail below. While it is reported that the numbers of birds at Stewart and Codfish Islands have declined historically (Darby and Seddon 1990, p. 57), it is unclear to what extent declines are currently under way.

As of 2007, in the sub-Antarctic island range of the yellow-eyed penguin, there were an estimated 400 pairs on Campbell Island (down from 490 to 600 pairs in 1997), and 570 pairs on the Auckland Islands (Houston, 2007, p. 3).

The yellow-eyed penguin is classified as "Endangered" by the International Union for Conservation of Nature (IUCN) criteria (BirdLife International 2007, p. 1). When the New Zealand Action Plan for Seabird Conservation was completed in 2000, the species' IUCN Status was 'Vulnerable,' and it was listed as Category B (second priority) on the Molloy and Davis threat categories employed by the New Zealand Department of Conservation (NZDOC) (Taylor 2000, p. 33). On this basis, the species was placed in the second tier of New Zealand's Action Plan for Seabird Conservation. The species is listed as "acutely threatened—nationally vulnerable" on the New Zealand Threat Classification System

List (Hitchmough *et al*. 2007, p. 45; Molloy *et al*. 2002, p. 20).

Summary of Factors Affecting the Yellow-eyed Penguin

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of the Yellow-eyed Penguin's Habitat or Range

Deforestation and the presence of grazing animals and agricultural activities have destroyed or degraded yellow-eyed penguin habitat throughout the species' range on the mainland South Island of New Zealand. Much of the decline in breeding numbers can be attributed to loss of habitat (Darby and Seddon 1990, p. 60; Taylor 2000, p. 94). The primary historic habitat of the reclusive yellow-eyed penguin on the southeast coast of the South Island of New Zealand was the podocarp hardwood forest. During the period of European settlement of New Zealand, almost all of this forest was cleared for agriculture, with forest clearing activities continuing into at least the 1970s (Sutherland 1999, p. 18). This has eliminated the bulk of the historic mainland breeding vegetation type for this species (Marchant and Higgins 1990, p. 237). With dense hardwood forest unavailable, the breeding range of yellow-eyed penguins has now spread into previously unoccupied habitats of scrubland, open woodland, and pasture (Marchant and Higgins 1990, p. 237). Here the breeding birds are exposed to new threats. In agricultural areas, breeding birds are exposed to the trampling of nests by domestic cattle. For example, on the mainland Otago Peninsula in 1985, cattle destroyed 25 out of 41 nests (60 percent) (Marchant and Higgins 1990, p. 238).

Yellow-eyed penguins are also more frequently exposed to fire in these new scrubland and agricultural habitat, such as a devastating fire in 1995 at the Te Rere Yellow-eyed Penguin Reserve in the southern portion of the mainland of the South Island, which killed more than 60 adult penguins out of a population of 100 adults at the reserve, as well as fledgling chicks on shore (Sutherland 1999, p. 2; Taylor 2000, p. 94). Five years after the fire, there was little evidence of recovery of bird numbers at this reserve (Sutherland 1999, p. 3), although there had been considerable efforts to restore the land habitat through plantings, creation of firebreaks, and predator control.

Habitat recovery efforts, dating as far back as the late 1970s and set out in the 1985–1997 Hoiho Species Conservation Plan (McKinlay 2001, p. 12), have focused on protecting and improving breeding habitats. Habitat has been purchased or reserved for penguins at the mainland Otago Peninsula, North Otago, and Catlins sites, with 20 mainland breeding locations (out of an estimated 32 to 42) reported to be under "statutory" protection against further habitat loss (Ellis 1998, p. 91). New, currently unoccupied areas have been acquired to provide the potential to support increased populations in the future (McKinlay 2001, p. 12). Fencing and re-vegetation projects have been implemented to restore nesting habitat and to exclude grazing animals from breeding habitats (McKinlay 2001, p. 12). In some cases, efforts to fence penguin reserves to reduce trampling by cattle have created more favorable conditions for attack by introduced predators (see Factor C) (Alterio *et al*. 1998, p. 187). In addition, the Yellow-eyed Penguin Trust has been active in the conservation of this species, and has purchased land specifically for the protection of the species (*http://yellow-eyedpenguin.org.nz*). Despite these efforts, yellow-eyed penguin numbers on the mainland have not increased and have continued to fluctuate dramatically at low levels, with no sustained increases over the last 27 years (McKinlay 2001, p. 10). Although we did not rely on future conservation efforts by New Zealand in our analysis of threats, we note that efforts in the second phase of the Hoiho Recovery Plan continue to focus on managing, protecting, and restoring the terrestrial habitat of the yellow-eyed penguin (McKinlay 2001, p. 15).

On the offshore and sub-Antarctic islands of its range, feral cattle and sheep destroyed yellow-eyed penguin nests on Enderby and Campbell Islands (Taylor 2000, p. 94). All feral animals were removed from Enderby Island in 1993, and from Campbell Island in 1984 (cattle) and 1991 (sheep) (Taylor 2000, p. 95). Reports indicate very little change in the quality of terrestrial habitat of the yellow-eyed penguin habitat on these islands (McKinlay 2001, p. 7).

Although individual locations remain susceptible to fire or other localized events, the threat of manmade habitat destruction has been reduced over the dispersed range of the species on the mainland South Island. In our analysis of other threat factors, in particular Factor C, we will further examine why the recovery goals for mainland populations have not been achieved. Specifically, the goal in the 1985–1997 recovery plan of maintaining two managed mainland populations, each with a minimum of 500 pairs, was not achieved (McKinlay 2001, p. 13). Eight years into the 2000–2025 recovery plan, the long-term goal to increase yellow-eyed penguin populations remains elusive. However, significant public and private efforts have been undertaken in New Zealand over past decades to protect and restore yellow-eyed penguin breeding habitat on the mainland South Island. Further, the species' island breeding habitats have either not been impacted or, if historically impacted, the causes of disturbance have been removed. In addition, the Yellow-eyed Penguin Trust has been active in the conservation of this species, and has purchased land specifically for the protection of the species. Because these conservation efforts have been implemented, we find that the present or threatened destruction, modification, or curtailment of its terrestrial habitat or range is not a threat to the species.

In the marine environment, yellow-eyed penguins forage locally around colony sites during the breeding season. Unlike most penguin species, yellow-eyed penguins tend to be benthic (bottom of ocean) rather than pelagic (surface of ocean) feeders (Mattern 2007, p. 295). They are known to feed on a variety of fish and squid species, including opal fish (*Hemerocoetes monopterygius*), blue cod (*Parapercis colias*), sprat (*Sprattus antipodum*), silverside (*Argentina elongata*), red cod (*Pseudophycis bachus*), and arrow squid (*Nototodarus sloani*) (van Heezik 1990b, pp. 209-210). Yellow-eyed penguins that were tracked from breeding areas on the Otago Peninsula on the mainland of the South Island foraged over the continental shelf in waters from 131 to 262 feet (ft) (40 to 80 meters (m)) deep. In foraging trips lasting on average 14 hours, they ranged a median of 8 mi (13 km) from the breeding area (Moore 1999, p. 49). Foraging ranges utilized by birds at the offshore Stewart Island were quite small (ca. 7.9 mi^2 (20.4 km^2)) compared to the areas used by birds at the adjacent Codfish Islands (ca. 208 mi^2 (540 km^2)) (Mattern *et al*. 2007, p. 115).

There is evidence that modification of the marine environment by human activities may reduce the viability of foraging areas for yellow-eyed penguins on a local scale. Mainland population declines in 1986–1987 have been attributed to "changes in the marine environment and failure of quality food" (McKinlay 2001 p. 9), but we have not found evidence attributing recent population changes at either mainland colonies or the more distant Campbell and Auckland Islands' colonies to changes in the marine environment.

Mattern *et al*. (2007, p. 115) concluded that degradation of benthic habitat by commercial oyster dredging is limiting viable foraging habitat and increasing competition for food for a small portion of Stewart Island penguins breeding in areas on the northeast coast of that island, resulting in chick starvation (King 2007, p. 106). Chick starvation and disease are the two most prevalent causes of chick death at the northeast Stewart Island study colonies (King 2007, p. 106). Poor chick survival and, presumably, poor recruitment of new breeding pairs, is reported to be the main cause of a decline in the number of breeding pairs (King 2007, p. 106). At the adjacent Codfish Island, where food is more abundant and diverse (Browne *et al.* 2007, p. 81), chicks have been found to flourish even in the presence of disease. Browne *et al.* (2007, p. 81) found dietary differences between the two islands. Stewart Island chicks received meals comprised of fewer species and less energetic value than those at Codfish Island. The foraging grounds of these two groups do not overlap, suggesting that local-scale influences in the marine environment (Mattern *et al.* 2007, p. 115) are impacting the Stewart Island penguins. These authors concluded that at Stewart Island, degradation of benthic habitat by commercial oyster dredging is limiting foraging habitat for yellow-eyed penguins. The 178 pairs on Stewart Island and adjacent islands make up 11 percent of the total current population, and only a portion of this number are affected by the reported degradation of benthic habitat by fisheries activities. Therefore, while the present or threatened destruction, modification, or curtailment of its marine habitat or range by commercial oyster dredging is a threat to chick survival for some colonies at Stewart Island, we find that the present or threatened destruction, modification, or curtailment of its marine habitat is not a threat to the species overall.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The yellow-eyed penguin has become an important part of the ecotourism industry on the mainland South Island of New Zealand, particularly around the Otago Peninsula and the Southland areas. Tourism is the primary commercial, recreational, or educational use of the yellow-eyed penguin. Approximately 126,000 tourists viewed penguins in New Zealand in 2006 and 2007 (NZ Ministry of Tourism, 2007).

When the proposed rule was published, we were not aware of tourism activities in the island portions of the range of the yellow-eyed penguin. However, since then, we have learned that tourists are viewing yellow-eyed penguins on Enderby Island, which is the northernmost island of a Subantarctic group known as the Auckland Islands approximately 320 km (199 mi) south of New Zealand. Yellow-eyed penguins are extremely wary of human presence and will not land on the beach if humans are in sight (McClung *et al.* 2004, p. 279). Yellow-eyed penguins select nest sites with dense vegetative cover and a high degree of concealment (Marchant and Higgins 1990, p. 240), and prefer to be shaded from the sun and concealed from their neighbors (Seddon and Davis 1989, p. 653). Given these secretive habits, research has focused on how the potential of increasing tourism impacts yellow-eyed penguins (Seddon and Ellenberg, 2008). In one study, yellow-eyed penguins showed lower breeding success in areas of unregulated tourism than in those areas visited infrequently for monitoring purposes only (McClung *et al.* 2004, p. 279).

In an older study, no obvious impacts of tourist presence were found (Ratz and Thompson 1999, p. 208). Breeding success appeared to be equivalent in both the colony visited by tourists and the colony not visited by tourists; however, the penguins were habituated to a particular noninvasive level of tourism. In newer studies, disturbance was associated with increased heart rate, stress level, energy use, and corticosterone levels (associated with stress) in parents and lower fledgling weights of chicks (Ellenberg *et al.* 2006, p. 95). Yellow-eyed penguins exhibited a stronger initial stress response than other penguin species at a breeding site exposed to unregulated tourism compared to an undisturbed area (Seddon and Ellenberg, 2008p. 171.) These studies have provided information, some of which is being used in the design of visitor management and control procedures at yellow-eyed penguin viewing areas to minimize disturbance to breeding pairs. A key impact from human disturbance described in the Recovery Plan is that yellow-eyed penguins may not come ashore or may leave the shore prematurely after landing. The Hoiho Recovery Plan identified 14 mainland areas where current practices of viewing yellow-eyed penguins already minimize tourism impacts on yellow-eyed penguins and recommends that practices in these areas remain unchanged. Eight additional areas were identified as suitable for development as tourist destinations to observe yellow-eyed penguins where minimization of tourism impacts can be achieved (McKinlay 2001, p. 21). NZDOC is using these existing lists to guide the approval of tourism. Overall, under the plan, tourism is being directed to those sites where impacts of tourism can be minimized. However, unregulated tourism still occurs (McKinlay 2001, p. 8; PenguinSpirit 2009, p. 2, BLI 2010b, p. 2) and affects penguins.

With respect to the impact of research on yellow-eyed penguins, flipper banding for scientific research was identified as having a negative effect on some penguin species. At a 2005 penguin symposium, van Heezik presented findings (pp. 265-266) that flipper banded penguins had a lower survival rate than nonbanded penguins for age class 2 to 11. Another review of scientific research regarding flipper banding found the survival rate of flipper banded penguins compared with nonbanded penguins to be 21 percent less (Froget *et al.* 1998, pp. 409-413). Dugger found a 10 percent reduced survival rate in stainless steel–banded penguins compared with nonbanded penguins (Petersen *et al.* 2006, p. 76). Petersen's review of the effects of flipper banding indicated that there may be negative effects of flipper banding.

Different types of banding have been used, and species appear to be affected differently by them. In addition, there may be coping mechanisms to compensate for any drag that penguins experience when swimming with flipper bands. Other evidence of negative effects of flipper banding include the finding that unbanded King penguin adults were more likely to successfully breed, possibly because they arrived earlier at the colony for courtship. They produced almost twice as many young over four breeding seasons (Gauthier-Clerc *et al.* 2004, p. 424). Researchers hypothesize that the unbanded penguins have a competitive advantage over the banded penguins, which appears to be a reasonable conclusion. This research identified flipper banding as a problem, and the penguin scientific community subsequently modified banding techniques. The detrimental tagging methods were abandoned or modified. Therefore, after evaluating this factor, we find that flipper banding, while it should continue to be monitored, does not constitute a threat to this species. We have found no other reports of impacts on this species from scientific research or any other commercial, recreational, scientific, or educational purposes.

Nature-based tourism has increased in recent decades. The New Zealand DOC, in cooperation with conservation, tourism, and industry stakeholders, has put measures in place to understand and minimize the impacts of tourism activities on the yellow-eyed penguin through the Hoiho Recovery Plan. A study by Seddon and Ellenberg in 2008 indicates that yellow-eyed penguins are particularly sensitive to human disturbance such as tourism (pp. 169-170). Although yellow-eyed penguins do not always exhibit an obvious alarm reaction, other penguin species have exhibited increased heart rates when humans were within 1 m (3 ft) of nesting penguins (Seddon and Ellenberg, 2008, pp. 167, 170). Yellow-eyed penguins needed more recovery time than other penguins after exposure to a stressor (p. 170), and this stress response carries with it an associated expenditure of energy. Based on this information, we find that overutilization for commercial, recreational, scientific, or educational purposes, particularly unregulated tourism, is a threat to the yellow-eyed penguin.

Factor C. Disease or Predation

Disease has been identified as a factor influencing both adult and chick mortality in yellow-eyed penguins. We have identified reports of one major disease outbreak involving adult penguins and ongoing reports of disease in yellow-eyed penguin chicks.

Initial investigation of a major die-off of adult yellow-eyed penguins at Otago Peninsula in 1990 failed to identify the etiology of the deaths (Gill and Darby 1993, p. 39). This involved mortality of 150 adult birds or 31 percent of a mainland population estimated at the time to include 240 breeding pairs. Subsequent investigation of avian malaria seroprevalence among yellow-eyed penguins found that the mortality features, climatological data, and pathological and serological findings at the time conformed to those known for avian malaria outbreaks (Graczyck *et al.* 1995, p. 404), leading the authors to conclude that avian malaria was responsible for the die-off. These authors associated the outbreak with a period of warmer than usual sea and land temperatures. More recently, Sturrock and Tompkins (2007, pp. 158–160) looked for DNA from malarial parasites in yellow-eyed penguins and found that all samples were negative. This suggests that earlier serological tests were overestimating the prevalence of infection or that infection was transient or occurred in age classes not sampled in their current study. While this raises questions as to the role of avian malaria in the 1990 mortality event, the authors noted, given the spread of avian malaria throughout New Zealand and previous results indicating infection and mortality in yellow-eyed penguins, that continued monitoring of malarial parasites in this species should be considered an essential part of their management until the issue of their susceptibility is resolved. There have been no subsequent disease-related die-offs of adult yellow-eyed penguins at mainland colonies since the 1990s (Houston 2007, p. 3).

The haemoparasite *Leucocytozoon*, a blood parasite spread by blackflies, was first identified in yellow-eyed penguins at the offshore Stewart and Codfish Islands in 2004 (Hill *et al.* 2007, p. 96) and was one contributor to high chick mortality at Stewart Islands in 2006–2007, which involved loss of all 32 chicks at the northeast Anglem Coast monitoring area of the Yellow-eyed Penguin Trust. This parasite may have spread from Fiordland crested penguins, which are known to house this parasite (Taylor 2000, p. 59). Chick mortality was also reported at this area in 2007–2008 (Houston 2008, pers. comm.). It is not clear if the *Leucocytozoon* predisposes animals to succumb from other factors, such as starvation or concurrent infection with other pathogens (such as diphtheritic stomatitis), or if it is the factor that ultimately kills them, but over 40 percent of chick mortality over three breeding seasons at Stewart Island study colonies was attributed to disease (King 2007, p. 106). The survival of infected chicks at nearby Codfish Island, where food is more abundant, indicates that nutrition can make a difference in whether mortality occurs in diseased chicks (Browne *et al.* 2007, p. 81; King 2007, p. 106). Healthy adults who are infected, but not compromised, by this endemic disease provide a reservoir for infection of new chicks through the vector of blackflies. No viable method of treatment for active infections in either chicks or adults has been identified.

At the mainland Otago Peninsula in the 2004–2005 breeding season, an outbreak of *Corynebacterium amycolatum* infection (diptheritic stomatitis) caused high mortality in yellow-eyed penguin chicks (Houston 2005, p. 267) at many colonies there and on Stewart Island (where it may have been a contributing factor to the mortalities discussed above from *Leucocytozoon*). Mortality was not recorded at Codfish Island or at the sub-Antarctic islands (Auckland and Campbell Islands). The disease produced lesions in the chicks' mouths and upper respiratory tract and made it difficult for the chicks to swallow. All chicks at Otago displayed the symptoms, but survival was better in older, larger chicks. Treatment with broad spectrum antibiotics was reported to have achieved "varying results," and it is not known how this disease is triggered (Houston 2005, p. 267).

In summary, disease has seriously impacted both mainland and Stewart Island populations of yellow-eyed penguins over the past two decades. A mainland mortality event in 1990, attributed to avian malaria, killed 31 percent of the mainland adult population of yellow-eyed penguin. While there is lack of scientific certainty over the impact of malaria on yellow-eyed penguins, the overall spread of this disease, the small population size of yellow-eyed penguins, and evidence of its presence in their populations lead us to conclude that this is an ongoing threat. Disease events contributed to or caused mortality of at least 20 percent of chicks at Stewart Island in 2006–2007 and complete mortality in local colonies. The continuing contribution to yellow-eyed penguin chick mortality from *Leucocytozoon* and diptheritic stomatitus at Stewart Island and the recent high mortalities of mainland chicks from diptheritic stomatitis indicate the potential for future emergence or intensified outbreaks of these or new diseases. The emergence of disease at both mainland and Stewart Island populations in similar time periods and the likelihood that Leucocytozoon was spread to the yellow-eyed penguin from the Fiordland crested penguin point out the significant possibility of future transmission of known diseases between colonies or between species, and the possibility of emergence of new diseases at any of the four identified breeding locations of the yellow-eyed penguin.

Predation of chicks and sometimes adults by introduced stoats (*Mustela erminea*) (which are good swimmers), ferrets (*M. furo*), cats (*Felis catus*), and dogs (*Canis domesticus*) is the principal cause of yellow-eyed penguin chick mortality on the South Island with up to 88.5 percent of chicks in any given habitat being killed by predators (Alterio *et al.* 1998, p. 187; Clapperton 2001, p. 187, 195; Darby and Seddon 1990, p. 45; Marchant and Higgins 1990, p. 237; McKinlay *et al.* 1997, p. 31; Ratz *et al.* 1999, p. 151; Taylor 2000, pp. 93–94). In a 6–year study of breeding success of yellow-eyed penguins in mainland breeding areas, predation accounted for 20 percent of chick mortality overall, and was as high as 63 percent overall in one breeding season (Darby and Seddon 1990, p. 53). Proximity to farmland and grazed pastures was found to be a factor accounting for high predator densities with 88 percent predation at one breeding area adjacent to farmland (Darby and Seddon 1990, p. 57). Of 114 yellow-eyed penguin carcasses found on the South Island mainland between 1996 and 2003, one-quarter of deaths were attributed to predation. Dogs and mustelids were found to be the most common predators (Hocken 2005, p. 4).

In light of this threat, protection of chicks from predators is a primary objective under the 2000–2025 Hoiho Recovery Plan. Approaches to predator control are being established and refined at breeding sites on the mainland (McKinlay *et al.* 1997, pp. 31–35), targeting ferrets, stoats, and cats. The New Zealand DOC has concluded that predation is a threat that may be managed through trapping or other cost-effective methods to protect chicks in nests (McKinlay 2001, p. 18). The recovery plan indicates that a minimum protection of 43 percent of nests would be needed to ensure population growth (McKinlay 2001, p. 18). The recovery plan establishes a goal of protecting 50 percent of all South Island nests from predators between 2000 and 2025. Where intensive predator control regimes have been put in place, they are effective (McKinlay *et al.* 1997, p. 31), capturing 69 to 82 percent of predators present. In a long-term analysis of three closely monitored study colonies, which make up roughly half the nests at the Otago Peninsula and about 10 to 20 percent of the nests on the mainland, Lalas *et al.* (2007, p. 237) found that the threat of predation on chicks by introduced terrestrial mammals had been mitigated by trapping and shooting, and no substantial predation events had occurred between 1984 and 2005. We do not have information on the extent to which anti-predator measures are in place for the remaining 80 to 90 percent of yellow-eyed penguin nests on the mainland of the South Island of New Zealand. Other efforts to remove or discourage predation have not been as successful. A widely applied approach of establishing "vegetation buffers" around yellow-eyed penguin nest sites to act as barriers between predators and their prey was found to actually increase predation rates. Predators preferred the buffer areas and used penguin paths within them to gain easy access to penguin nests (Alterio *et al.* 1998, p. 189). Given these conflicting reports, we cannot evaluate to what extent management efforts are moving toward the goal of protection of 50 percent of all yellow-eyed penguin nests on the mainland.

Offshore, at Stewart and Codfish Islands, there are a number of introduced predators, but mustelids are absent. Research indicated that the presence of feral cats could be depressing the population of yellow-eyed penguins at Stewart Island. (Harper 2004, p. 26; Massaro and Blair 2003, p. 107). Weka (*Gallirallus australis*) have been eradicated from Codfish Island, but may prey on eggs and small chicks in the Fouveaux Strait and some breeding islands in the Stewart Island region at the southern tip of New Zealand (Darby 2003, p. 152; Massaro and Blair 2003, p. 111).

Some islands, including the Codfish and Bravo group, have Norway rats (*Rattus norvegicus,* Pacific rats (*R. exulans),* and ship rats (*R. rattus*), which are thought to prey on small chicks (Massaro and Blair 2003, p. 107). Even though Norway rats are present on Campbell Island, evidence of egg or chick predation by terrestrial mammalian predators was not observed during two breeding seasons (Taylor 2000, pp. 93–94).

At Auckland Island, it is reported that feral pigs (*Sus scrofa*) probably kill adults and chicks (Taylor 2000, pp. 93).

At Otago Peninsula, even as objectives are set to attempt to bring terrestrial predators under more effective control, an emerging threat is predation by the New Zealand sea lion (*Phocarctos hookeri*). Since 1985, sea lions have recolonized the area and predation of yellow-eyed penguins has increased. Penguin remains have been more frequently found in sea lion scat samples. Two penguin breeding sites in close proximity to the founding nursery area of female sea lions have been particularly impacted. The number of nests at these two colonies has declined sharply since predation was first observed and when colonization by female sea lions first took place. As discussed above, these two sites are among those that have been intensively and successfully protected from introduced terrestrial predators between 1984 and 2005 (Lalas *et al.* 2007, p. 237), so declines can be directly attributed to sea lion predation. The predation has been attributed to one female, the daughter of the founding animal. Population modeling of the effect of continued annual kills by sea lions predicts the collapse of small populations (fewer than 100 nests) subject to targeted predation by one individual sea lion. At the current time, none of the 14 breeding sites at Otago Peninsula exceeds 100 nests. No action has been taken to control this predation, although removal of predatory individuals has been suggested (Lalas *et al.* 2007, pp. 235–246). Similar predation by New Zealand sea lions was observed at Campbell Island in 1988 and was considered a probable cause for local declines there (Moore and Moffat 1992, p. 68). Some authors have speculated that New Zealand sea lion may take yellow-eyed penguins at Stewart Island, but there are no documented reports (Darby 2003, p. 152). Because of its continued role in suppressing the recovery of yellow-eyed penguin populations and because of the continued impact of introduced terrestrial and avian predators and native marine predators, we find that predation is a threat to the yellow-eyed penguin.

In summary, on the basis of the best available scientific information, we find that disease and predation, which have impacted both mainland and island populations, threaten the yellow-eyed penguin. New or recurrent disease outbreaks are reasonably likely to occur in the future and may result in further declines throughout the species' range. Although some predator eradication efforts within breeding areas of the yellow-eyed penguin have been successful, predation continues to affect the species, and we do not expect that regulatory mechanisms will be sufficient to address or ameliorate the threats to the species in the foreseeable future. Furthermore, the threat of predation by endemic sea lions is impacting populations on the mainland and at the Campbell Islands, and we have no reason to believe this threat will not continue to reduce population numbers of the yellow-eyed penguin in those areas. We find that disease and predation are threats to this species.

Factor D. Inadequacy of Existing Regulatory Mechanisms

The yellow-eyed penguin is protected under New Zealand's Wildlife Act of 1953, which gives absolute protection to wildlife throughout New Zealand and its surrounding marine economic zone. No one may kill or have in their possession any living or dead protected wildlife unless they have appropriate authority.

The species inhabits areas within Rakiura National Park, which encompasses Stewart and Codfish Islands (Whenua Hou). Under section 4 of New Zealand's National Parks Act of 1980 and Park bylaws, "the native plants and animals of the parks shall as far as possible be preserved and the introduced plants and animals shall as far as possible be eradicated." In addition to national protection, all New Zealand sub-Antarctic islands, including Auckland and Campbell Islands, are inscribed on the World Heritage List (2008, p. 16), although no additional protections are afforded by this designation. We do not have information to evaluate whether and to what extent these National Park bylaws reduce threats to the yellow-eyed penguin in these areas.

The yellow-eyed penguin is considered a "threatened" species, and measures for its protection are outlined under the New Zealand DOC's Action Plan for Seabird Conservation in New Zealand (Taylor 2000, pp. 93–94) (see discussion of Factor D for Fiordland crested penguin). Ellis *et al.* (1998, p. 91) reported that habitat has been purchased or reserved for penguins at the mainland Otago Peninsula, North Otago and Catlins sites. Twenty mainland breeding locations (out of an estimated 32 to 42 sites) are reported to be under "statutory protection" against further habitat loss. However, we have not found a complete breakdown of the types of legal protection in place for these areas, of the percent of the total mainland population encompassed under such areas, or of the effectiveness, where they are in place, of such regulatory mechanisms in reducing the identified threats to the yellow-eyed penguin.

As a consequence of its threatened designation, a 2000–2025 Recovery Plan for this species was developed. This plan builds on the first phase (1985–1997) of Hoiho Recovery efforts (McKinlay 2001, pp. 12–13). This plan lays out future objectives and actions to meet the long-term goal of increasing yellow-eyed penguin populations and achieving active community engagement in their conservation (McKinlay 2001, pp. 1–24). The Recovery Plan outlines proposed measures to address chronic factors historically affecting individual colonies, such as destruction or damage to colonies due to fire, livestock grazing, and other manmade disturbance; predation by introduced predators; disease; and the impact of human disturbance (especially through tourism activities) (McKinlay 2001, pp. 15–22). Another objective of the plan is to provide enduring legal guarantees of protections for breeding habitat through reservation or covenant (McKinlay 2001, p. 12). The best available information does not allow us to evaluate in detail the progress that has been made in meeting the eight objectives of the 2000–2025 recovery plan, but as discussed elsewhere, the population recovery goals of the original earlier plan continue to be hard to reach for all but the Auckland Islands, and the development of anti-predator measures is an ongoing challenge. We are aware, as discussed in analysis of other threat factors, that concerted public and private efforts on these objectives continue. However, in the absence of concrete information on implementation of the plan and reports on its efficacy, we did not rely on future measures proposed in the Hoiho Recovery Plan in our threats analysis.

New Zealand has in place the New Zealand Marine Oil Spill Response Strategy, which provides the overall framework to mount a response to marine oil spills that occur within New Zealand's area of responsibility. The aim of the strategy is to minimize the effects of oil on the environment and human safety and health. The National Oil Spill Contingency Plan promotes a planned and nationally coordinated response to any marine oil spill that is beyond the capability of a local regional council or outside the region of any local council (Maritime New Zealand 2007, p. 1). As discussed below under Factor E, rapid containment of spills in remote areas and effective triage response under this plan have shown these to be effective regulatory mechanisms (New Zealand Wildlife Health Center 2007, p. 2; Taylor 2000, p. 94).

A review of the best available information indicates that there are general, or in some cases specific, protective or regulatory measures to address threats to the yellow-eyed penguin. The best available information indicates that despite the existence of these protective or regulatory measures to address the threats to the yellow-eyed penguin, local marine habitat modification through oyster dredging in some areas (Factor A), disease and predation pressure (Factor C), and gillnet fisheries bycatch (Factor E), continue to act as threats to the yellow-eyed penguin. We therefore find that the existing regulatory mechanisms are currently inadequate to protect the yellow-eyed penguin.

Factor E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species

The Action Plan for Seabird Conservation in New Zealand (Taylor 2000, p. 94) reported that there is no evidence that commercial or recreational fishing is impacting prey availability for the yellow-eyed penguin.

Offshore Fisheries Bycatch

Long-line fisheries were indicated as potentially having an effect on yellow-eyed penguins (BLI 2010b, p 2). Long-line fishing uses a long line with baited hooks attached to hanging fishing lines at various intervals. These lines are sometimes set using an anchor, or they can be left to drift. Thousands of hooks can be attached and the lines can be miles long and can alternatively be dragged along the seafloor or the surface of the ocean. Seabirds, particularly petrels, are especially vulnerable to long-line fishing because they take baited hooks. In certain conditions, birds can get hooked and tangled in the line and drown. This type of fishing impacts a number of New Zealand seabird species; however, the Action Plan for Seabird Conservation indicates it is unlikely that yellow-eyed penguins are caught in long-lines. The National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries does not identify this as a threat to yellow-eyed penguins (Ministry of Fisheries and New Zealand DOC (MOF and NZDOC) 2004, p. 57)).

Coastal Fishing Bycatch

Otago Peninsula

New Zealand's National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries, prepared by the MOF and NZDOC (2004, p. 57), indicated that yellow-eyed penguins are being incidentally caught in inshore set fishing nets (also known as gill nets). Gill nets are mesh nets, and they can at times be thousands of meters long. A study of bycatch of yellow-eyed penguins along the southeast coast of South Island of New Zealand during the period 1979–1997 identified gill-net entanglement as a significant threat to the species (Darby and Dawson 2000, p. 327). Fishing nets are used in various ways. They may be set as anchored nets in long rows at or near the bottom of the ocean, or sometimes drift with a fishing vessel. Mortality was highest in areas adjacent to the Otago Peninsula (on the east coast of South Island, below Banks Peninsula) breeding grounds. Approximately 55 of 72 gill-netted penguins were found in this particular area (Darby and Dawson 2000, p. 329) as bycatch. An analysis of 185 carcasses collected between 1975 and 1997 found that 42 (23 percent) showed features consistent with mortality from gill-net entanglement. In that period, a further 30 entanglements were reported to officials (Darby and Dawson 2000, p. 327). While these numbers may appear small for the timeframe under study, the authors consider them to be underestimates of actual bycatch mortality (Darby and Dawson 2000, p. 331) because not all fishermen report bycatch.

Most gill-net entanglements reported by Darby and Dawson (2000, p. 331) are from a small geographic area at or near the Otago Peninsula, near the small concentrations of yellow-eyed penguins.

In 1996, for example, there were approximately 350 breeding pairs of yellow-eyed penguin on the Otago Peninsula. Given these small numbers, the authors report that gill-net bycatch may be severe at a local scale. One small colony inside the entrance to Otago harbor suffered seven bycatch mortalities and was subsequently abandoned. The death of 32 birds along the north Otago coast over the period of the study is significant in light of the reported breeding population of only 39 pairs in this region, and, at Banks Peninsula, 7 reported mortalities occurred where there were only 8–10 breeding pairs (Darby and Dawson 2000, p. 331). Given the small sizes of local yellow-eyed penguin concentrations, this mortality rate is significant to the maintenance of breeding colonies and the survival of adults in the population.

Banks Peninsula

In response to bycatch of various species, set net bans have been implemented in the vicinity of the Banks Peninsula on the east coast of South Island, which has been designated as a marine reserve. A 4–month set net ban was primarily designed to reduce entanglements of Hector's dolphin (*Cephalorhynchus hectori*), as well as yellow-eyed penguins and white-flippered penguins (NZ DOC 2007, p. 1). Early reports were that this ban had been widely disregarded (Taylor 2000, p. 70). Based on the best available information, we are unable to conclude that these measures at the Banks Peninsula had been effective in reducing bycatch of yellow-eyed penguins. The Hoiho Recovery Plan states that bycatch is likely the largest source of mortality at sea; the Plan outlines the need for research and liaison with fisheries managers to inform implementation of further measures to reduce the impact of fishing operations on yellow-eyed penguins (McKinlay 2001, p. 19). We do not have information on whether these proposed measures have been implemented. Therefore, for purposes of this analysis, we did not rely on these proposed measures to evaluate incidental take from gill-net entanglement.

Based on the significant gill-net bycatch mortality of yellow-eyed penguins along the southeast coast of the South Island of New Zealand, which has the potential to impact over a quarter of the population, we find that fisheries bycatch is a threat to the yellow-eyed penguin. In spite of efforts to regulate this activity, bycatch in coastal gill net fisheries is a threat to yellow-eyed penguins foraging from mainland breeding areas; therefore, we expect this threat to continue into the foreseeable future.

Under Factor A, we concluded that habitat modification by commercial oyster dredging is a threat to local yellow-eyed penguin colonies at Stewart Island, but we have not found evidence of direct competition for prey between yellow-eyed penguins and human fisheries activities. While following penguins from mainland colonies fitted with Global Positioning System (GPS) dive loggers, Mattern *et al*. (2005, p. 270) noted that foraging tracks of adult penguins were remarkably straight. They hypothesized that individuals were following dredge marks from bottom trawls, but there is no information to indicate that fishery interaction has any impact on the penguins. Therefore, we find that commercial or recreational fishing is not a threat to this species. However, local marine habitat modification through oyster dredging (commercial oyster dredging is a threat to chick survival for some colonies at Stewart Island), and fisheries bycatch from coastal or inshore set net or gillnet fishing, continue to act as threats to the yellow-eyed penguin in some areas of their range.

Oil and chemical spills

We examined the possibility that oil and chemical spills may impact yellow-eyed penguins. Such spills, should they occur and not be effectively managed, can have direct effects on marine seabirds such as the yellow-eyed penguin. In the range of the yellow-eyed penguin, the sub-Antarctic Campbell and Auckland Islands are remote from shipping activity and the consequent risk of oil or chemical spills is low. The Stewart Islands populations at the southern end of New Zealand and the southeast mainland coast populations are in closer proximity to vessel traffic and human industrial activities which may increase the possibility of oil or chemical spill impacts. Much of the range of the yellow-eyed penguin on mainland New Zealand lies near Dunedin, a South Island port city, and a few individuals breed at Banks Peninsula just to the south of Christchurch, another major South Island port. While yellow-eyed penguins do not breed in large colonies, their locally distributed breeding groups are found in a few critical areas on the coast of the South Island and its offshore islands. A spill event near the mainland South Island city of Dunedin and the adjacent Otago Peninsula could have a major impact on the 14 breeding sites documented there. Nonbreeding season distribution along the same coastlines provides the potential for significant numbers of birds to encounter spills at that time as well. Two spills have been recorded in this overall region. In March 2000, the fishing vessel *Seafresh 1*sank in Hanson Bay on the east coast of Chatham Island and released 66 U.S. tons (T) (60 tonnes (t)) of diesel fuel. Rapid containment of the oil at this remote location prevented any wildlife casualties (New Zealand Wildlife Health Center 2007, p. 2). The same source reported that in 1998 the fishing vessel *Don Wong 529*ran aground at Breaksea Islets off Stewart Island. Approximately 331 T (300 t) of marine diesel were spilled along with smaller amounts of lubricating and waste oils.

With favorable weather conditions and establishment of triage response, no casualties of the *Don Wong 529*pollution event were discovered (Taylor 2000, p. 94). There is no doubt that an oil spill near a breeding colony could have a major effect on this species (Taylor 2000, p. 94). However, based on the wide distribution of yellow-eyed penguins around the mainland South Island, offshore, and on sub-Antarctic islands, the low number of previous incidents around New Zealand, and the fact that each was effectively contained under the New Zealand Marine Oil Spill Response Strategy and resulted in no mortality or evidence of impacts on the population, we find that oil and chemical spills are not threats to the yellow-eyed penguin.

Yellow-eyed Penguin Finding

Yellow-eyed penguin populations number approximately 1,600 breeding pairs. After severe declines from the 1940s, mainland yellow-eyed penguin populations have fluctuated at low numbers since the late 1980s. The total mainland population (on the east coast of South Island) of 450 breeding pairs (Houston 2007, p. 3) is well below single-year levels recorded in 1985 and 1997 (600 to 650 pairs) and well below historical estimates of abundance (Darby and Seddon 1990, p. 59). At Stewart Island and its adjacent islands, there are an estimated 180 breeding pairs. There are an estimated 400 pairs at Campbell Island where numbers have declined since 1997, and 570 pairs at the Auckland Islands.

Some of the documented factors affecting yellow-eyed penguin populations are tourism and predation. Predation occurs by introduced (and to a lesser extent native) predators within the species' breeding range. The impact of predators is inferred from the decline of this species during the period of introduced predator invasion and from documentation of continuing predator presence and predation. New Zealand laws including the bylaws of New Zealand's national parks, which encompass some of the range of the yellow-eyed penguin, provide some protection for this species. New Zealand also has programs for eradication of nonnative invasive species, which includes nonnative predators. However, while complete eradication of predators in isolated island habitats may be possible, permanent removal of the introduced mammalian predators on the mainland has not been achieved, and the ongoing threat of predation remains. Both intensive trapping and physical protection of significant breeding groups through fencing have proven successful for yellow-eyed penguins at local scales in terms of reducing predation, but existing efforts require ongoing commitment, and not all breeding areas have been protected. More recently, local-scale predation by New Zealand sea lions reestablishing a breeding presence at the mainland Otago Peninsula has become a threat to yellow-eyed penguin populations as this rare and endemic Otariid species recovers. This threat has also been documented for Campbell Island. We conclude that predation is still a significant threat to yellow-eyed penguins.

Disease is an ongoing factor negatively influencing yellow-eyed penguin populations. Disease has seriously impacted both mainland and Stewart Island colonies of yellow-eyed penguins in the last two decades. In mainland populations, avian malaria is thought to have led to mortality of 31 percent of the adult population on the mainland of New Zealand in the early 1990s, and an outbreak of *Cornybacterium* infection caused high chick mortality in 2004–2005 and contributed to disease mortality at Stewart Island. Entire cohorts of penguin chicks at one breeding location at Stewart Island have been lost to the pathogen *Leucocytozoon*, especially at times when other diseases and other stress factors, such as food shortages, were present. Given the ongoing history of disease outbreaks at both the island and mainland locations, it is highly likely that new or renewed disease outbreaks will impact this species in the foreseeable future with possible large-scale mortality of adults and chicks and consequent breeding failures and population reductions. Emergence or recurrence of such outbreaks on the mainland, where there are currently 450 breeding pairs, or at island breeding areas could result in severe reductions for a species which totals only 1,600 breeding pairs rangewide.

The yellow-eyed penguin is also impacted by ongoing activities in the marine environment. Local marine habitat modification of the sea floor through oyster dredging has been implicated in food shortages at penguin colonies at Stewart Island, which combined with disease, has led to years of 100 percent mortality of chicks at local breeding sites there. Bycatch in coastal gillnet fisheries is a threat to yellow-eyed penguins foraging around mainland breeding areas despite efforts to regulate this activity. In this case, regulatory mechanisms are currently inadequate and we do not have any information that would lead us to anticipate that this would change in the foreseeable future.

We considered whether pollution from oil or chemicals is a threat to the yellow-eyed penguin. Documented oil spill events have occurred within the range of this species in the last decade, but there have been no documented direct or indirect impacts on this species. Such events are rare and New Zealand oil spill response and contingency plans have been shown to be in place and effective in previous events; therefore, we do not find this to be a threat to the yellow-eyed penguin.

In considering the foreseeable future as it relates to the status of the yellow-eyed penguin, we considered the threats acting on the yellow-eyed penguin, as well as population trends. We considered the historical data to identify any relevant existing trends that might allow for reliable prediction of the future (in the form of extrapolating the trends). The available data indicate that historical declines, which were the result of habitat loss and predation, continue in the face of the current threats of predation from introduced predators, disease, gillnet fisheries bycatch, and the inadequacy of regulatory mechanisms throughout the species' range. Based on our analysis of the best available information, we have no reason to believe that population trends will change in the future, or that the effects of current threats acting on the species will be ameliorated in the foreseeable future.

The yellow-eyed penguin has experienced consistent widespread declines in the past, and declines and low population numbers persist. This species has a relatively high reproductive rate (compared to other penguins) and substantial longevity. Despite these life history traits, which should provide the species with the ability to rebound, and despite public and private efforts undertaken in New Zealand to address the threats to its survival, the species has not recovered. Historical declines resulting from habitat loss and predation are exacerbated by the impacts of predators, disease, and the inadequacy of regulatory mechanisms throughout the species' range. The threat of predation by endemic sea lions is impacting populations on the mainland and at the Campbell Islands. New or recurrent disease outbreaks are likely to cause further declines throughout the range in the foreseeable future. Just offshore of the southern tip of the South Island, local breeding groups at Stewart Island have been impacted by disease in concert with food shortages brought on by alteration of their marine habitat. At the Auckland Islands, the population has remained stable but exists at low numbers and, like all yellow-eyed penguin populations, is susceptible to the emergence of disease and impacts of predation. Increased tourism is taxing the species based on the penguins' increased energy usage due to human presence. Because of the species' low population size (estimated to be approximately 1,600 breeding pairs); its continued decline in three out of four areas, the threats of predation by primarily introduced species, disease, fisheries bycatch, tourism, and the inadequacy of regulatory mechanisms, we find that the yellow-eyed penguin is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Significant Portion of the Range Analysis

To determine whether any portion of the range of the yellow-eyed penguin warrants further consideration as endangered, we evaluated the geographic concentration of threats and the significance of portions of the range to the conservation of the species. Our evaluation was in the context of whether any potential threats are concentrated in one or more areas of the projected range, such that if there were concentrated impacts, those populations might be threatened, and whether any such population or complex might constitute a significant portion of the range. The word "range" is used here to refer to the range in which the species currently exists, and the word "significant" refers to the value of that portion of the range being considered to the conservation of the species. We also considered factors used to determine biological significance of a population, including: the quality, quantity, and distribution of habitat relative to the biological requirements of the species; the historical value of the habitat to the species; the frequency of use of the habitat; the uniqueness or importance of the habitat for other reasons such as breeding, feeding, or suitability for population expansion; and its genetic diversity (the loss of genetically based diversity may substantially reduce the ability of the species to respond and adapt to future environmental changes). We do not find that any one population is more biologically significant than the other three; however, we did find that the occurrence of certain threats is uneven across the range of the yellow-eyed penguin. On this basis, we determined that some portions of the yellow-eyed penguin's range might warrant further consideration as possibly endangered significant portions of its range.

The yellow-eyed penguin's range can be divided into four areas. The first area consists of the mainland colonies distributed along the southeast coast of the South Island of New Zealand. This mainland area is separated from the three island groups to the south. Just to the south is the Stewart-Codfish Islands group, which lies 18.75 mi (30 km) below the mainland South Island across the Fouveaux Strait. Stewart Island is a large island of 1,091 square mi (mi^2) (1,746 square km (km^2)), and Codfish Island is a small island of 8.75 mi^2 (14 km^2) located 6.25 mi (10 km) west of Stewart Island. The third and fourth areas of yellow-eyed penguin habitat are the sub-Antarctic Auckland Islands and Campbell Island, which lie 300 mi (480 km) and 380 mi (608 km), respectively, south of the southern tip of the South Island. These four groups are clearly isolated from each other and from other portions of the yellow-eyed penguin's range.

We evaluated these four areas of the entire range of the yellow-eyed penguin to determine which areas may warrant further consideration. Under the five-factor analysis, we determined that predation, disease, and inadequacy of regulatory mechanisms are threats to the yellow-eyed penguin throughout all of its range. In addition, we determined that fisheries bycatch and marine habitat modification from oyster dredging are threats to the species in only some portions of its range.

For the first two areas, two unique threats were identified. Fisheries bycatch was identified as a unique threat for the mainland South Island population; and marine habitat modification due to oyster dredging was identified as a unique threat for the Stewart-Codfish Island population. Therefore, we determined that yellow-eyed penguins on the mainland and on the Stewart-Codfish Islands may face a greater level of threat than populations at the Auckland and Campbell Islands. In addition, the mainland population of 450 pairs represents more than a quarter of the overall reported population of 1,600 pairs, indicating that this may be a significant portion of the range. Having met these two initial tests, we analyzed whether this portion of the range is both significant and endangered. There have been large fluctuations in the mainland population of yellow-eyed penguins since at least 1980, with cyclical periods of population decline, followed by some recovery. As described in our threat factor analysis, these larger fluctuations have been tied to changes in the marine environment and the quality of food, as well as to periodic outbreaks of disease. The species is described as inherently robust, but recovery from these fluctuations is hampered by chronic predation threats as well as by the ongoing impact of fisheries bycatch. The combination of these cyclical and chronic factors has kept the mainland population fluctuating within the range of a few hundred to about 600 pairs over the last three decades. We have no evidence that the single factor of fisheries bycatch is driving the species toward extinction. Because the current population trend for the mainland populations is one of decline and fluctuation around low numbers, rather than precipitous decline, and because reproduction and recruitment are still occurring, we have determined the population is not currently in danger of extinction, but is likely to become so within the foreseeable future.

The Stewart-Codfish Islands population represents only 11 percent of the overall population of yellow-eyed penguins and its habitat is small in terms of geographical area. It is only 18.75 mi (30 km) away from the mainland of New Zealand, where the majority of this species resides. Marine habitat modification due to oyster dredging was identified as a unique threat for the Stewart-Codfish Island population. However, due to the proximity of this small population to the more numerous mainland population portion of the range, and because the population is adjacent to colonies at the southern tip of the South Island, we do not find that this portion of the range is significant relative to the conservation of this species. Therefore, we have determined the population is not currently in danger of extinction but is likely to become so within the foreseeable future.

With respect to the Auckland Islands and Campbell Islands populations, there were no additional threats found to be acting on these populations nor did we determine that either of these populations have any unique biological significance to the species as a whole. Therefore, we have determined that the Auckland Islands and Campbell Islands portions of the species population is not currently in danger of extinction, but is likely to become so within the foreseeable future.

In conclusion, we did not find that any one portion of the species' population contributes more substantially than others to the representation, resiliency, or redundancy of the species. At this time, although the different populations face different threats, there is no evidence to suggest that threats affect portions of the range disproportionately, or will in the foreseeable future. Therefore, we are listing the yellow-eyed penguin as threatened throughout all of its range under the Act.

White-flippered Penguin *(Eudyptula minor albosignata)*

Background

Among those researchers who have considered the phylogeny of the *Eudyptula* penguins (little penguins) in detail, Banks *et al.* (2002, p. 35), supported by Peucker *et al.* (2007, p. 126), make a strong case that the white-flippered penguin is part of one of two distinct lineages, or clades, of *Eudyptula* species (the Australian-Otago clade and the New Zealand clade, which includes the white-flippered penguin), each descended from one common ancestor.

Limited evidence for subspeciation within the New Zealand clade is found in some genetic differences, but the taxonomic status of the white-flippered penguin remains somewhat unclear (Peucker *et al.* 2007, p. 126). The New Zealand DOC considers the white-flippered penguin, with its distinct life history and morphological traits, as the southern end of a clinal variation of the little penguin (Houston 2007, p. 3). Consistent with the findings of Banks *et al.* (2002, p. 35), the New Zealand DOC recognizes the white-flippered penguin as an endemic sub-species in its Action Plan for Seabird Conservation in New Zealand (Taylor 2000, p. 69). We recognize the findings of Banks *et al.* (2002, p. 35), and the determination of the New Zealand Department of Conservation, and consider the white-flippered penguin (*Eudyptula minor albosignata*) as one of six recognized subspecies of the little penguin (*Eudyptula minor*). We accept the white-flippered penguin as a subspecies, *Eudyptula minor albosignata*, which follows the

Integrated Taxonomic Information System (ITIS 2010).

The overall population of little penguins, which are found around Australia and New Zealand, numbers 350,000 to 600,000 birds. The total breeding population of the white-flippered subspecies, which is only found in New Zealand, is about 10,460 birds (Challies and Burleigh 2004, p. 1).

It is estimated that the Peninsula-wide population was tens of thousands of pairs at the time of European settlement. White-flippered penguins were "very common" on the Banks Peninsula in the late 1800s (Challies and Burleigh 2004, p. 4). Distribution of colonies was more widespread on the shores of the Banks Peninsula during the 1950s, with penguins nesting from the seaward headlands around to the inshore heads of bays.

At Motunau Island there are an estimated 1,650 breeding pairs or about 4,590 birds (Ellis *et al.* 1998, p. 87). This population is reported to have increased slightly since the 1960s (Taylor 2000, p. 69). On Banks Peninsula, exhaustive counts of all colonies in 2000–2001 and 2001–2002 found 68 colonies with a total of 2,112 nests or about 5,870 birds (Challies and Burleigh 2004, p. 5). This detailed survey increased the previously reported minimum estimates of 550 pairs published in 1998 (Ellis *et al.* 1998, p. 87), which were derived from partial surveys of only easily accessible colonies (Challies and Burleigh 2004, p. 1). While baseline information is lacking, Challies and Burleigh (2004, p. 5) have estimated that the present population is less than 10 percent of the population that was occupied on the Peninsula prior to European settlement. Detailed monitoring of four individual colonies indicated that severe declines continue, with an overall loss of 83 percent of 489 nests monitored over the period from 1981–2000 (Challies and Burleigh 2004, p. 4).

The white-flippered penguin breeds on Motunau Island and the Banks Peninsula of the South Island of New Zealand. Birds disperse locally around the eastern South Island. Breeding adults appear to remain close to nesting colonies in the nonbreeding season (Taylor 2000, p. 69; Challies and Burleigh 2004, p. 5; Brager and Stanley 1999, p. 370). White-flippered penguins feed on small shoaling fish such as pilchards (*Sardinops neopilchardus*) and anchovies (*Engraulis australis*) (Brager and Stanley 1999, p. 370).

The little penguin is classified as a species of "Least Concern" in the IUCN Red List (BirdLife International 2007, p. 1); there is no separate status for the white-flippered subspecies. On New Zealand's Threat Classification system list, the white-flippered subspecies is listed as "acutely threatened—nationally vulnerable," indicating small to moderate population and moderate recent or predicted decline (Hitchmough *et al.* 2007, p. 45; Molloy *et al.* 2002, p. 20). This species was addressed in the Action Plan for Seabird Conservation in New Zealand, and it was ranked as Category B (second priority) on the Molloy and Davis threat categories employed by the New Zealand DOC (Taylor 2000, p. 33).

Summary of Factors Affecting the White-flippered Penguin

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of White-flippered Penguin's Habitat or Range

The terrestrial breeding habitat of the white-flippered penguin comprises the shores of the Banks Peninsula south of Christchurch, New Zealand, and of Motunau Island about 62 mi (100 km) north. Banks Peninsula has a convoluted coastline of approximately 186 mi (300 km), made up of outer coast and deep embayments (Challies and Burleigh 2004, p. 1). Motunau is a small island of less than 0.3 mi (0.5 km) in length. While cattle or sheep sometimes trample nests at Banks Peninsula, white-flippered penguin nest sites are usually in rocky areas or among tree roots where they are inaccessible to such damage (Taylor 2000, p. 69). Fire has also been identified as a factor that could threaten white-flippered penguin habitat, but we are not aware of documented fire incidents (Taylor 2000, p. 69).

On the basis of this information, we find that the present or threatened destruction, modification, or curtailment of its habitat or range is not a threat to the white-flippered penguin.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

White-flippered penguins are the object of privately managed local tourism activities at the Banks Peninsula (Taylor 2000, p. 70). Neither the New Zealand Action Plan for Seabird Conservation nor the IUCN Conservation Assessment and Management Plan provides any evidence that tourism is a factor affecting white-flippered penguin populations (Taylor 2000, p. 69; Ellis *et al.* 1998, p. 87). There is no evidence of use of the species for other commercial, recreational, scientific or educational purposes.

On the basis of this information, we find that overutilization for commercial, recreational, scientific, or educational purposes is not a threat to the white-flippered penguin.

Factor C. Disease or Predation

There is no evidence of disease as a threat to the white-flippered penguin.

The most significant factor impacting white-flippered penguins is predation at Banks Peninsula by introduced mammalian predators. Populations are reported to have declined drastically since 1980 due to predation (Williamson and Wilson 2001, pp. 434–435). Challies and Burleigh reported that predation on white-flippered penguins is mainly by ferrets, feral cats, and possibly stoats (2004, p. 1). We know that introduced predators such as these as well as rats prey on penguins. They have been known to take chicks, eggs, and adults. On one occasion, 50 dead penguins were found with mustelid bite marks on their necks (Challies 2009, pers. comm.). Dogs have also been cited as a potential predator (Taylor 2000, p. 69). In the past 25 years, predators have overrun colonies at the accessible heads and sides of bays at Banks Peninsula, reducing colony distribution to less accessible and more remote headlands and outer coasts (Challies and Burleigh 2004, p. 4). Thirty-four colonies (50 percent) surveyed in 2000 to 2002, containing 1,345 nests (69 percent of the nests at Banks Peninsula), were considered to be vulnerable to predation. Seven of the 12 largest colonies (each containing more than 20 nests) contained either the remains of penguins that had been preyed on or other evidence predators had been there (Challies and Burleigh 2004, p. 4). The five large colonies not considered vulnerable to predation were either protected by bluffs or, in one case, located on an island.

The encroachment of predators destroyed the most accessible colonies first, in a progression from preferred habitat at the heads of bays towards the coast along a gradient of increasing coastal erosion. In the 1950s, penguins were still nesting around the heads of bays. These colonies disappeared soon thereafter (Challies and Burleigh 2004, p. 4). Of four colonies of greater than 50 nests on the sides of bays, one was destroyed between 1981 and 2000, and nest numbers in the other three colonies were reduced by 72 to 77 percent. In these four colonies, the total number of nests decreased 83 percent between 1981 and 2000, from 489 nests down to 85 nests. The surviving colonies are almost all inside the bays close to the headlands or on the peripheral coast (Challies and Burleigh 2004, p. 4), with white-flippered penguins breeding primarily on rocky sites backed by bluffs. Challies and Burleigh (2004, p. 4) concluded, given the subspecies' historical habitat and the difficulties of landing at these exposed breeding sites, that predation has forced white-flippered penguins into marginal, non-preferred habitat.

At the present time, colonies are largest either on inshore predator-free islands or in places on the mainland where predators are being controlled or which are less accessible to predators. The historic decline in penguin numbers is clearly continuing based on the current evidence of predation in existing recently surveyed colonies and we expect this to continue into the foreseeable future (Challies and Burleigh 2004, p. 5). In addition to documenting direct overland access to colonies by predators, Challies and Burleigh (2004, p. 5) documented predation at colonies thought not to be accessible over land. For example, there is evidence that stoats, which are good swimmers, are reaching colonies at otherwise inaccessible parts of the shoreline, indicating that the spread of predation continues.

The potential for dispersal and establishment of new colonies, which might allow for expansion of white-flippered penguin numbers, is also severely limited by predation. Fifty percent or more of adults attempt to nest away from their natal colony. Historically, such movements led to interchange between colonies and maintenance of colony size even as dispersal took place. With the presence of predators, this dispersal now leads breeding birds to settle in areas accessible to predators where the penguins are eventually killed (Challies and Burleigh 2004, p. 5). One consequence of this pattern of dispersal and predation is that colonies suffer a net loss of breeding adults.

Predator trapping started in 1981 on Godley Head near Christchurch and is carried out by a network of volunteers and private landowners around the Banks Peninsula. Some small, predator-proof fences were erected to protect vulnerable colonies (Taylor 2000, p. 70; Williamson and Wilson 2001, p. 435). It is not clear how widespread such efforts are over the large geographical area of the Banks Peninsula or how successful they are. Williamson and Wilson (2001, p. 435) reported on two predator trapping programs that occurred in 1988 and 1991 at two relic colonies at the heads of Flea and Stony Bays. Predator trapping programs continue today (Challies 2009, pers. comm.). Preliminary results indicated white-flippered penguins numbers were stable at Flea Bay, but Stony Bay populations of white-flippered penguins were in decline. Even though such trapping efforts began in 1981, Challies and Burleigh (2004, p. 5) concluded on the basis of data collected in the 2000–2001 and 2001–2002 breeding seasons that the historic decline in white-flippered penguin numbers was continuing. However, although the numbers are still less than 10 percent of what existed at the time of European settlement, since 2000, most of the penguin colonies have grown by approximately 50 percent (Challies 2009, pers. comm.).

At Motunau Island, the only other breeding area for this subspecies, there are no introduced predators. Rabbits, which could have impacted breeding habitat, were eradicated in 1963 (Taylor 2000, p. 70). The Action Plan for Seabird Conservation in New Zealand lists pest quarantine measures to prevent new animal and plant pest species reaching Motunau Island as a needed future management action (Taylor 2000, p. 70), but we have no reports on whether such measures are now in place, and we cannot discount the current or future risk of predator introduction to Motunau Island.

Predators are present at the larger Banks Peninsula colony (56 percent of the nests for the subspecies), but not currently at the smaller colony at Motunau Island (46 percent of the nests), although the risk of future predator introduction to Motunau Island exists. On the basis of information on the impact of predators, the failure of existing programs to eliminate them, and the possibility of dispersal of predators to current predator-free areas such as Motunau Island, we conclude that predation by introduced mammals is a threat to the white-flippered penguin.

Factor D. Inadequacy of Existing Regulatory Mechanisms

The white-flippered penguin is protected under New Zealand's Wildlife Act of 1953, which gives absolute protection to wildlife throughout New Zealand and its surrounding marine economic zone. No one may kill or have in their possession any living or dead protected wildlife unless they have appropriate authority.

In 1998, the IUCN Conservation Assessment and Management Plan (CAMP) data sheet for white-flippered penguin (Ellis *et al.* 1998, p. 87) concluded that the deteriorating status of this subspecies was not a high priority for the New Zealand DOC due to budgetary constraints. The CAMP noted that activities to date had not been government funded, but self funded by investigators or by grants from non-governmental organizations. Since then, the New Zealand DOC has adopted the Action Plan for Seabird Conservation, which includes recommendations on management of terrestrial threats to the white-flippered penguin as well as threats within the marine environment. We did not rely on these measures in our analysis because we do not have reports on which measures, if any, have been implemented and how they relate, in particular, to efforts to reduce the threat of predation on white-flippered penguins at Banks Peninsula.

The Banks Peninsula marine waters have special protective status as a marine sanctuary, which was established in 1988 and primarily directed at protection of the Hector's dolphin (*Cephelorhynchus hectori*) from bycatch in set nets. The 4–month set net ban, from November to the end of February, which also includes Motunau Island, is designed to reduce entanglements of these dolphins and to reduce the risk of entanglement of white-flippered penguins and yellow-eyed penguins (NZ DOC 2007, p. 1). Ten years ago, in the Action Plan for Seabird Conservation, this ban was reported to have been widely disregarded (Taylor 2000, p. 70). That Action Plan states that restriction on the use of set nets near key white-flippered penguin colonies may be necessary to protect the subspecies and recommends an advocacy program to encourage set net users to adopt practices that will minimize seabird bycatch. We have information indicating that white-flippered penguins are frequently caught in set nets, and no current information to indicate whether, or to what extent, set net restrictions have reduced take at either Banks Peninsula or Motunau Island.

New Zealand has in place The New Zealand Marine Oil Spill Response Strategy, which provides the overall framework to mount a response to marine oil spills that occur within New Zealand's area of responsibility. The aim of the strategy is to minimize the effects of oil on the environment and on human safety and health. The National Oil Spill Contingency Plan promotes a planned and nationally coordinated response to any marine oil spill that is beyond the capability of a local regional council or outside the region of any local council (Maritime New Zealand 2007, p. 1). As discussed below under Factor E, rapid containment of spills in remote areas and effective triage response under this plan have shown these to be effective regulatory mechanisms (New Zealand Wildlife

Health Center 2007, p. 2; Taylor 2000, p. 94). However, because the two major concentrations of white-flippered penguins are near a major South Island port, we conclude under Factor E that oil spills are a threat to this subspecies.

Given that existing programs have failed to eliminate introduced predators and that these predators appear to be spreading, we believe their impact on the white-flippered penguin will continue in the future. There is no information to suggest that the current effects of bycatch will be reduced in the foreseeable future, nor that regulatory mechanisms will become sufficient to address or ameliorate this threat to the subspecies. Based on the occurrence of previous oil spills around New Zealand and the location of the only two breeding populations of white-flippered penguins adjacent to Christchurch, a major South Island port, we find that oil spills will likely occur in the future. Furthermore, because of the low overall numbers of white-flippered penguins, there is a high likelihood that oil spill events, should they occur in this area, will impact white-flippered penguins. On the basis of a review of available information and on the basis of the continued threats of predation, fisheries bycatch (including the use of set nets), and oil spills to this subspecies, we find that inadequacy of existing regulatory mechanisms is a threat to the white-flippered penguin.

Factor E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species

In 2000, Taylor reported that New Zealand's Action Plan notes that white-flippered penguins were frequently caught in nearshore set nets, especially around Motunau Island (p. 69). The number of birds currently caught is not known, but there is a history of "multiple net catches" of penguins around Motunau Island (Ellis *et al*, 1998, p. 87). Restrictions on the use of set nets in the areas of Banks Peninsula and Motunau Island were instituted in 1988 (see discussion under Factor D above), but bans on leaving nets set inshore overnight were reported to be widely disregarded a decade ago (Ellis *et al.* 1998, p. 87). Such impacts interact with the more severe threat of predation at Banks Island, exacerbating declines there. Reports indicate bycatch impacts are most severe at Motunau Island, which is currently predator-free. Although enforcement of all fisheries regulations has increased within the past few years (Challies 2009, pers. comm.), based on the best available information we do not have a basis to conclude that rates of bycatch have in fact declined or will decline in the foreseeable future. We have found no documented information to indicate that net restrictions have reduced take. Therefore, we find that bycatch of the white-flippered penguin by fishing activities is a threat to this subspecies of penguin.

We have examined the possibility that oil and chemical spills may impact white-flippered penguins. Such spills, should they occur and not be effectively managed, can have direct effects on marine seabirds such as the white-flippered penguin. The entire subspecies nests in areas of moderate shipping volume coming to Port Lyttelton at Christchurch, New Zealand. This port lies adjacent to, and just north of, the Banks Peninsula and just south of Motunau Island. On this basis, the Action Plan for Seabird Conservation in New Zealand specifically identifies a large oil spill as a key potential threat to this species (Taylor 2000, pp. 69–70) and recommends that penguin colonies be identified as sensitive areas in oil spill contingency plans (Taylor 2000, pp. 70–71).

Two spills have been recorded in the overall region of the South Island of New Zealand and its offshore islands. These spills did not impact the white-flippered penguin. In March 2000, the fishing vessel *Seafresh 1*sank in Hanson Bay on the east coast of Chatham Island and released 66 T (60 t) of diesel fuel. Rapid containment of the oil at this remote location prevented any wildlife casualties (New Zealand Wildlife Health Center 2007, p. 2). The same source reported that, in 1998, the fishing vessel *Don Wong 529*ran aground at Breaksea Islets, off Stewart Island. Approximately 331 T (300 t) of marine diesel was spilled along with smaller amounts of lubricating and waste oils. With favorable weather conditions and establishment of triage response, no casualties from this oil spill event were discovered (Taylor 2000, p. 94).

While New Zealand has a good record of oil spill response, an oil spill in the vicinity of one of the two breeding colonies of the white-flippered penguin, which lie closely adjacent to the industrial port of Port Lyttelton, could impact a large portion of the individuals of this subspecies if not immediately contained. Previous spills have been in more remote locations, with more leeway for longer term response before oil impacted wildlife. Based on the occurrence of previous spills around New Zealand, the low overall numbers of white-flippered penguins, and the location of their only two breeding populations adjacent to Christchurch, a major South Island port, there is a high likelihood that oil spill events, should they occur in this area, will impact white-flippered penguins. Therefore, we find that oil spills are a threat to the white-flippered penguin.

Based on the analysis above, we find that both fisheries bycatch and the potential for oil spills are threats to the white-flippered penguin now and in the foreseeable future.

White-flippered Penguin Finding

Predation by introduced mammalian predators is the most significant factor threatening white-flippered penguin within the subspecies' breeding range. Predation by introduced species has contributed to the historical decline of this subspecies since the late 1800s and is reducing numbers at the current time. In addition to reducing numbers in existing colonies, the presence of predators has been documented as a barrier to the dispersal of breeding birds and the establishment of new colonies, perhaps indicating larger declines are to be expected. New Zealand laws require protection of this native subspecies. Anti-predator efforts have not stopped declines of white-flippered penguins at Banks Peninsula, although eradication of predators has been achieved at Motunau Island. Removal of introduced mammalian predators on the mainland Banks Peninsula is an extremely difficult, if not impossible, task. Trapping and physical protection of a few local breeding groups through fencing have proven locally successful, but these efforts are not widespread. The Banks Peninsula, with 186 mi (300 km) of coastline and approximately 70 white-flippered penguin colonies, is a very large area to control, and predation impacts will continue. The threat of reinvasion remains, both at Motunau Island and in areas of the Banks Peninsula where predator control has been implemented (Taylor 2000, p. 70; Challies and Burleigh 2004, p. 5). Therefore, we find that predation is a threat to the white-flippered penguin.

The white-flippered penguin is also impacted by threats in the marine environment. While set-net bans have been in place since the 1980s to reduce take of white-flippered penguins and other species, bycatch in coastal gill-net fisheries is known to result in mortality to white-flippered penguins foraging from breeding areas. Although we do not have quantitative data on the extent of bycatch, the best available information indicates that take by set nets is exacerbating the more severe threat of predation at Banks Island, while such impacts are the primary threat at Motunau Island. Based on the best available scientific and commercial information, we conclude that bycatch is a threat to the white-flippered penguin.

Documented oil spills have occurred in the vicinity of the South Island of New Zealand in the last decade. While such events are rare, future events have the potential to impact white-flippered penguins. If a spill event were to occur near the city of Christchurch and the adjacent Banks Peninsula, and not be immediately contained, it would be very likely to impact either, or both, of the two breeding sites of the white-flippered penguin in a very short time, affecting up to 65 percent of the population at one time. While New Zealand oil spill response and contingency plans have been shown to be effective in previous events, the location of the only two breeding areas of this subspecies near industrial areas and marine transport routes increase the likelihood that spill events will impact the white-flippered penguin.

Major reductions in the numbers of nests in individual colonies and the loss of colonies indicate the population of white-flippered penguin at Banks Peninsula is declining as the threat of predation impacts this subspecies. The subspecies has a low population size (10,460 individuals), with breeding populations concentrated solely in two highly localized breeding areas. Bycatch from fisheries activities is an ongoing threat to members of this subspecies breeding at both Motunau Island and the Banks Peninsula. For both breeding areas, which are close to an industrial port and shipping lanes, oil spills are a threat to the white-flippered penguin in the foreseeable future.

In considering the foreseeable future as it relates to the status of the white-flippered penguin, we considered the threats acting on the subspecies, as well as population trends. We considered the historical data to identify any relevant existing trends that might allow for reliable prediction of the future (in the form of extrapolating the trends).

The available data indicate that the historic decline in penguin numbers is clearly continuing based on the current evidence of predation by introduced species in existing recently surveyed colonies at Banks Island. Based on our analysis of the best available information, we have no reason to believe that population trends will change in the future, nor that the effects of current threats acting on this subspecies will be ameliorated in the foreseeable future. Therefore, we find that the white-flippered penguin is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Significant Portion of the Range Analysis

Having determined that the white-flippered penguin is likely to become in danger of extinction within the foreseeable future throughout all of its range, we also considered whether there are any significant portions of its range where the subspecies is currently in danger of extinction.

White-flippered penguins breed in two areas; one area is on the shores of the Banks Peninsula south of Christchurch on the mainland of New Zealand, and the other area is Motunau Island about 62 mi (100 km) north. Colonization of any possible intermediate breeding range appears to be precluded by predation (Challies and Burleigh 2004, p. 5). The Banks Peninsula colony is larger, consisting of about 2,110 breeding pairs; Motunau Island has about 1,635 breeding pairs. During our analysis, we did not find that there were any significant differences in the quality, quantity, or distribution of habitat relative to the biological requirements of the species. Nor did we find that there was uniqueness of either habitat for reasons such as breeding, feeding, or suitability for population expansion. No genetic differences were found between the populations such that one or the other was found to be significant.

Threats in the marine environment, particularly fisheries bycatch, have similar impacts on the two areas. Given the proximity of each colony to the port of Christchurch, we conclude that oil spills are also an equal threat in both areas. Predation by introduced predators is documented at Banks Peninsula, and introduction of predators is a potential future threat at Motunau Island, where population numbers are stable. Because predation is a current threat in the Banks Peninsula portion of the range, we considered whether the Banks Peninsula portion of the range, where population declines are ongoing, may be currently in danger of extinction. Although the threat of introduced predators is greater at the Banks Peninsula, two other factors offset this: a combination of local management protection of some colonies and the existence of inaccessible refugia from predators for some small colonies on the outer coast and offshore rocks and islands. The threat of predation is somewhat greater at the Banks Peninsula relative to Motunau Island, but as discussed in our analysis under Factor D, the best available scientific and commercial data suggest that this threat is not so disproportionately severe as to place the species in danger of extinction at the Banks Peninsula portion of its range at present. As a result, we have determined that there are no significant portions of the range in which the subspecies is currently in danger of extinction. Therefore, we are listing the white-flippered penguin as threatened throughout all of its range under the Act.

Fiordland Crested Penguin *(Eudyptes pachyrhynchus)*

Background

The Fiordland crested penguin, also known by its Maori name, tawaki, is endemic to the South Island of New Zealand and adjacent offshore islands southwards from Bruce Bay. The species also nests on Solander Island (0.3 mi² (0.7 km²), Codfish Island (5 mi² (14 km²)), and islands off Stewart Island at the south end of the South Island (Taylor 2000, p. 58). Major portions of the range are in Fiordland National Park (4,825 mi² (12,500 km²)) and Rakiura National Park (63 mi² (163 km²)) on Stewart Island and on adjacent islands. Historically, there are reports of breeding north to the Cook Straits and perhaps on the southernmost part of the North Island (Ellis *et al.* 1998, p. 69). The Fiordland crested penguin breeds in colonies situated in inaccessible, dense, temperate rainforest along shores and rocky coastlines, and sometimes in sandy bays. It feeds on fish, squid, octopus, and krill (van Heezik 1989, pp. 151-156).

Outside of the breeding season, the birds have been sighted around the North and South Islands and south to the sub-Antarctic islands, and the species is a regular vagrant to southeastern Australia (Simpson 2007, p. 2; Taylor 2000, p. 58). Houston (2007a, p. 2) of the New Zealand DOC comments that the appearance of vagrants in other locations is not necessarily indicative of the normal foraging range of Fiordland crested penguins; however, he also states that the non-breeding range of this species is unknown.

A five-stage survey effort, conducted during 1990–1995, documented all the major nesting areas of Fiordland crested penguin throughout its known current range (McLean and Russ 1991, pp. 183–190; Russ *et al.* 1992, pp. 113–118; McLean *et al.* 1993, pp. 85–94; Studholme *et al.* 1994, pp. 133–143; McLean *et al.* 1997, pp. 37–47). In these studies, researchers systematically surveyed the entire length of the range of this species, working their way along the coast on foot to identify and count individual nests, and conducting small boat surveys from a few meters offshore to identify areas to survey on foot. The coastline was also scanned from a support ship, to identify areas to survey (McLean *et al.* 1993, p. 87). A final count of nests for the species resulted in an estimate of between 2,500 and 3,000 nests annually (McLean *et al.* 1997, p. 45) and a corresponding number of 2,500 to 3,000 breeding pairs. The staging of this survey effort reflects the dispersed distribution of small colonies of this species along the convoluted and inaccessible mainland and island coastlines of the southwest portion of the South Island of New Zealand.

Long-term and current data on overall changes in abundance are lacking. The June 2007 Fiordland National Park Management Plan (New Zealand Department of Conservation (NZ DOC) 2007, p. 53) observed that Fiordland crested penguin numbers appear to be stable, and reported on the nesting success of breeding pairs at island (88 percent) versus mainland (50 percent) sites. The Management Plan raises uncertainty as to whether 50 percent nesting success will be sufficient to maintain the mainland population long term. Populations on Open Bay Island decreased by 33 percent between 1988 and 1995 (Ellis *et al.* 1998, p. 70), and a long-term decline may have occurred on Solander Island (Cooper *et al.* 1986, p. 89). Historical data report thousands of individuals in locations where numbers in current colonies are 100 or fewer (Ellis *et al.* 1998, p. 69). The species account in the New Zealand Action Plan for Seabird Conservation states that "the population status of the species throughout its breeding range is still unknown and will require long-term monitoring to assess changes" (Taylor 2000, p. 58).

The IUCN Red List (BirdLife International 2010, p. 1) classifies this species as "Vulnerable" because it has a small population assumed to have been undergoing a rapid reduction of at least 30 percent over the last 29 years. This classification is based on trend data from a few sites. For example, at Open Bay Island there was a 33 percent decrease for the time period 1988–1995. The Fiordland crested penguin is listed as Category B (second priority) on the Molloy and Davis threat categories employed by the New Zealand DOC (Taylor 2000, p. 33) and placed in the second tier in New Zealand's Action Plan for Seabird Conservation. The species is listed as "acutely threatened—nationally endangered" on the New Zealand Threat Classification System list (Hitchmough *et al.* 2007, p. 38; Molloy *et al.* 2003, pp. 13–23). Under this classification system, which is nonregulatory, species experts assess the placement of species into threat categories according to both status criteria and threat criteria. Relevant to the Fiordland crested penguin evaluation are its low population size and reported declines of greater than or equal to 60 percent of the total population in the last 100 years (Molloy *et al.* 2003, p. 20).

Summary of Factors Affecting the Fiordland Crested Penguin

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of the Fiordland Crested Penguin's Habitat or Range

The Fiordland crested penguin has a patchy breeding distribution from Jackson Bay on the west coast of the South Island of New Zealand southward to the southwest tip of South Island and southern offshore islands, including Stewart Island. A major portion of this range is encompassed by the Fiordland National Park on South Island and Solander Island and Rakiura National Park on Stewart Island and on adjacent islands at the southern tip of New Zealand. The majority of the breeding range of the Fiordland crested penguin lies within national parks and is currently protected from destruction and modification. The only reported instance of terrestrial habitat modification comes from the presence of deer (no species name provided) in some colonies that may trample nests or open up habitat for predators (Taylor 2000, p. 58). Therefore, we find that the present destruction, modification, or curtailment of the terrestrial habitat or range of the Fiordland crested penguin is not a threat to the species.

The marine foraging range of the Fiordland crested penguin is poorly documented. Recent observations on the foraging behavior of the species around Stewart and Codfish Islands found birds foraging very close to shore and in shallow water (Houston 2007a, p. 2), indicating the species may not be a pelagic (open ocean) feeder. The species is a vagrant to more northerly areas of New Zealand and to southeastern Australia, but that is not considered indicative of its normal foraging range (Houston 2007a, p. 2).

"Prey shortage due to sea temperature change" while foraging at sea has been cited as a threat to Fiordland crested penguins because of possible changes in prey distribution as a result of warming sea temperatures. ((Ellis *et al.* 2007, p. 6; Taylor 2000, p. 59). However, the Action Plan for Seabird Conservation in New Zealand concluded that the effects of oceanic changes or marine perturbations such as El Nino events on this species are unknown (Taylor 2000, p. 59). The plan identified the need for future research on distribution and movements of this species in the marine environment (Taylor 2000, p. 61).

Based on this analysis, we find that the present or future destruction, modification, or curtailment of the terrestrial and marine habitat or range is not a threat to the Fiordland crested penguin.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Although human disturbance of colonies is rare because the birds generally nest in inaccessible sites, this species exhibits high nest fidelity, and their ability to reproduce may be significantly impacted by a small amount of human disturbance (St. Clair 1999, pp. 37-41). In more accessible areas, such as the northern portion of the range at South Westland, large concentrations of nests occur in areas accessible to people. In addition, tourism may disturb breeding (McLean *et al.* 1997, p. 46; Taylor 2000, p. 58). The 2000 Action Plan for Seabird Conservation in New Zealand stated that guidelines are needed to control visitor access to mainland penguin colonies and accessible sites should be protected as wildlife refuges (Taylor 2000, p. 60). It is unclear whether such measures have been implemented based on the information available. Research activities, particularly handling penguins for purposes such as insertion of transponders and weighing, may also disturb breeding birds. Houston (2007a, p. 1) reported that monitoring of breeding success at Jackson's Head has been abandoned due to concerns of adverse effects of the research on breeding success and recruitment. There is no evidence of use of the species for other commercial, recreational, scientific, or educational purposes.

The threat of human disturbance could increase as tourism activities become more widespread in the region, and we have no information that indicates this threat will be alleviated for the Fiordland crested penguin in the foreseeable future. Because this species is so sensitive to human disturbance and exhibits high nest fidelity, we find that the present overutilization for commercial, recreational, scientific, or educational purposes, particularly human disturbance from tourism, is a threat to the survival of the Fiordland crested penguin.

Factor C. Disease or Predation

Reports from 1976 documented that Fiordland crested penguin chicks have been infected by the sandfly-borne protozoan blood parasite (*Leucocytozoon tawaki)* (Taylor 2000, p. 59) (see discussion under Factor C for the yellow-eyed penguin). Diseases such as avian cholera, which has caused the deaths of southern rockhopper penguin adults and chicks at the Campbell Islands, are inferred to be a potential problem in Fiordland crested penguin colonies (Taylor 2000, p. 59). However, with no significant disease outbreaks reported, the best available information leads us to conclude that disease is not a threat to this species.

Predation from introduced mammals and birds is a threat to the Fiordland crested penguin (Taylor 2000, p. 58; Ellis *et al.* 1998, p. 70). Comments received from the New Zealand DOC link historical declines of Fiordland crested penguins to the time of arrival of mammalian predators, particularly stoats, to the area (Houston 2007a, p. 1). Only Codfish Island, where 144 nests have been observed, is fully protected from introduced mammalian and avian predators (Studholme *et al.* 1994, p. 142). This island lies closely adjacent to Stewart Island, so the future possibility of predator reintroduction is possible. Mustelids, especially stoats, are reported to take eggs and chicks in mainland colonies and may occasionally attack adult penguins (Taylor 2000, p. 58). The Norway rat, ship rat, and Pacific rat are also likely predators, but there is no direct evidence of rat predation of Fiordland crested penguins. Feral cats and pigs are also potential predators, but they are not common in nesting areas. Recent observations since the development of the Action Plan (Taylor 2000, p. 58), which originally discounted the impact of the introduced possum (*Trichosurus vulpecula*), indicate that this species has now colonized the mainland range of the Fiordland crested penguin in South Westland and Fiordland. Initially thought to be vegetarians, it is now documented that possums eat birds, eggs, and chicks and also compete for burrows with native species. It is not yet known if they compete for burrows or eat the eggs of Fiordland crested penguins, as they do other native species, but it is likely (Houston 2007b, p. 1). Domestic dogs are also known to kill adult penguins and disturb colonies near human habitation (Taylor 2000, p. 58).

Weka, which are omnivorous, flightless rails about the size of chickens and native to other regions of New Zealand, have been widely introduced onto offshore islands of New Zealand. At Open Bay Islands and Solander Islands, this species has been observed destroying the eggs and killing the chicks of Fiordland crested penguins. At Open Bay Island colonies, weka caused 38 percent of egg mortality observed and 20 percent of chick mortality (St. Clair and St. Clair 1992, p. 61). The decline in numbers of Fiordland crested penguin on the Solander Islands from "plentiful" to a few dozen since 1948 has also been attributed to egg predation by weka (Cooper *et al.* 1986, p. 89). Among the future management actions identified as needed in New Zealand's Action Plan for Seabird Conservation are eradicating weka from Solander Island and addressing the problem of weka predation at Open Bay Islands (Taylor 2000, p. 60).

The available data indicate that historical declines have been linked to introduced predators on the South Island of New Zealand, and recently documented declines have been attributed to introduced predators. Given the remote and widely dispersed range of the Fiordland crested penguin, especially on the mainland of the South Island, significant anti-predator efforts are largely impractical for this species. We are unaware of any time-bound plan to implement anti-predator protection for Fiordland crested penguins or of any significant efforts to stem ongoing rates of predation. Therefore, we find that predation by introduced species is reasonably likely to continue in the foreseeable future. Predator control programs have been undertaken on only a few islands in a limited portion of the Fiordland crested penguin's range and are not practicable in the inaccessible mainland South Island strongholds of the species (Taylor 2000, p. 59).

Predation by introduced mammalian species is the primary threat facing the Fiordland crested penguin on the mainland South Island of New Zealand. On breeding islands free of mammalian predators, for example, on Open Bay Islands and Solander Island, an introduced bird, the weka, is a predator of Fiordland penguin eggs and chicks. Only Codfish Island is fully protected from introduced mammalian and avian predators. Therefore, we find that although predation by introduced species is not a threat to the Fiordland crested penguin on Codfish Island, it is a threat to this species in other portions of its range.

Factor D. Inadequacy of Existing Regulatory Mechanisms

The Fiordland crested penguin is protected under New Zealand's Wildlife Act of 1953, which gives absolute protection to wildlife throughout New Zealand and its surrounding marine economic zone. No one may kill or have in their possession any living or dead wildlife unless they have appropriate authority.

The majority of the range of the Fiordland crested penguin is within the Fiordland National Park (which includes Solander Island) and adjacent parks, including Rakiura National Park on Stewart Island. Fiordland National Park covers 15 percent of public conservation land in New Zealand. Under section 4 of New Zealand's National Parks Act of 1980 and Park bylaws, "the native plants and animals of the parks shall as far as possible be preserved and the introduced plants and animals shall as far as possible be eradicated" (NZ DOC 2007, p. 24). The June 2007 Fiordland National Park Management Plan (NZ DOC 2007, pp. 1–4) contains, in its section on Preservation of Indigenous Species and Habitats, a variety of objectives aimed at maintaining biodiversity by preventing the further loss of indigenous species from areas where they were previously known to exist. The Fiordland crested penguin is specifically referenced in the audit of biodiversity values to be preserved in the Park (NZ DOC 2007, p. 53). In addition, the Fiordland Marine Management Act of 2005 establishes the Fiordland Marine area and 8 marine reserves within that area, which encompass more than 2.18 million ac (882,000 ha) extending from the northern boundary of the Park to the southern boundary (excluding Solander Island) (NZ DOC 2007, p. 29). The species also inhabits Rakiura National Park on Stewart Island and Whenua Hou (Codfish Island) and is protected by New Zealand's National Parks Act of 1980 and Park bylaws.

The Fiordland National Park is encompassed in the Te Wahipounamu—South West New Zealand World Heritage Area. World Heritage areas are designated under the World Heritage Convention because of their outstanding universal value (NZ DOC 2007, p. 44). Such designation does not confer additional protection beyond that provided by national laws.

Despite these designations and the possibility of future efforts, we have no information to indicate that measures have been implemented that reduce the threats to the Fiordland crested penguin.

The Fiordland crested penguin has been placed in the group of birds ranked as second tier threat status in New Zealand's Action Plan for Seabird Conservation on the basis of its being listed as 'Vulnerable' by IUCN Red List Criteria and as Category B (second priority) on the Molloy and Davis threat categories employed by the New

Zealand DOC (Taylor 2000, p. 33). The Action Plan, while not a legally binding document, outlines actions and priorities intended to define the future direction of seabird management in New Zealand. High-priority future management actions identified are eradication of weka from Big Solander Island and development of a management plan for the Open Bay Islands to address the problem of weka predation on Fiordland crested penguins and other species. We do not have information to allow us to evaluate whether any of these proposed actions and priorities have been carried out and, therefore, have not relied on this information in our threat analysis.

New Zealand has in place the New Zealand Marine Oil Spill Response Strategy, which provides the overall framework to mount a response to marine oil spills that occur within New Zealand's area of responsibility. The aim of the strategy is to minimize the effects of oil on the environment and on human safety and health. The National Oil Spill Contingency Plan promotes a planned and nationally coordinated response to any marine oil spill that is beyond the capability of a local regional council or outside the region of any local council (Maritime New Zealand 2007, p. 1). As discussed below under Factor E, rapid containment of spills in remote areas and effective triage response under this plan have shown these to be effective regulatory mechanisms (New Zealand Wildlife Health Center 2007, p. 2; Taylor 2000, p. 94).

Major portions of the coastal and marine habitat of the Fiordland crested penguin are protected under a series of laws, and the species itself is covered under the New Zealand Wildlife Act. New Zealand's National Parks Act specifically calls for controlling and eradicating introduced species. While there has been limited success in controlling some predators of Fiordland crested penguins at isolated island habitats comprising small portions of the overall range, the comprehensive legal protection of this species has not surmounted the logistical and resource constraints that stand in the way of limiting or eradicating predators on larger islands and in inaccessible mainland South Island habitats. Furthermore, we are not able to evaluate whether efforts to reduce the threats of human disturbance discussed in Factor B have been implemented or achieved results.

On the basis of this information, we find that inadequacy of existing regulatory mechanisms is a threat to the Fiordland crested penguin.

Factor E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species

Commercial fishing in much of the species' range is a comparatively recent development and is considered unlikely to have played a significant role in historic declines (Houston 2007a, p. 1). New Zealand's Seabird Action Plan noted that Fiordland crested penguins could potentially be caught in set nets near breeding colonies and that trawl nets are also a potential risk. Competition with squid fisheries is also noted as a potential threat (Taylor 2000, p. 59; Ellis *et al.* 1998, p. 70; Ellis *et al.* 2007, p. 7). The 1998 CAMP recommended research on foraging ecology to identify potential competition with commercial fisheries and effects of climatic variation (Ellis *et al.* 1998, pp. 70–71), but we are not aware of the results of any such studies. The New Zealand DOC (Houston 2007a, p. 1), in its comments on our 90–day petition finding (73 FR 77303), noted that the "assessment of threats overstates the threat from fisheries" to the Fiordland crested penguin. The distribution and behavior of this species may reduce the potential impact of bycatch. The Fiordland crested penguin is distributed widely along the highly convoluted, sparsely populated, and legally protected South Island coastline for a linear distance of over 155 mi (250 km), as well as along the coasts of several offshore islands. These marine reserves are granted protection under the Marine Reserves Act of 1971 (NZ DOC 2010, pp. 1-3). The Act, in part, states that the reserves shall be preserved as far as possible in their natural state, marine life of the reserves shall as far as possible be protected and preserved, the public shall have freedom of access and entry to the reserves, and no person shall fish in a marine reserve [unless specifically authorized]. Significant feeding concentrations of the species, which might be susceptible to bycatch, have not been described. Given the absence of documentation of actual impacts of fisheries bycatch on the Fiordland crested penguin, we conclude that this is a not threat to the species.

We have examined the possibility that oil and chemical spills may impact Fiordland crested penguins. Such spills, should they occur and not be effectively managed, can have direct effects on marine seabirds such as the Fiordland crested penguin. The range of the Fiordland crested penguin on the southwest coast of the South Island of New Zealand is remote, far from shipping activity and away from any major human population centers. Thus the consequent risk of oil or chemical spills is low. The Stewart Islands populations at the southern end of New Zealand are in closer proximity to vessel traffic and human industrial activities, which may increase the possibility of oil or chemical spill impacts. Two spills have been recorded in this overall region. In March 2000, the fishing vessel *Seafresh 1*sank in Hanson Bay on the east coast of Chatham Island and released 66 T (60 t) of diesel fuel. Rapid containment of the oil at this remote location prevented any wildlife casualties (New Zealand Wildlife Health Center 2007, p. 2). The same source reports that, in 1998, the fishing vessel *Don Wong 529*ran aground at Breaksea Islets off Stewart Island. Approximately 331 T (300 t) of marine diesel was spilled along with smaller amounts of lubricating and waste oils. With favorable weather conditions and establishment of triage response, no casualties from this pollution event were discovered (Taylor 2000, p. 94). There is no doubt that an oil spill near a breeding colony could have a major effect on this species (Taylor 2000, p. 94). However, based on the remote distribution of Fiordland penguins around the mainland South Island, and on offshore islands at the southern tip of the South Island, the low number of previous incidents around New Zealand, and the fact that each was effectively contained under the New Zealand Marine Oil Spill Response Strategy and resulted in no mortality or evidence of impacts on the population, we find that oil and chemical spills are not a threat to the Fiordland crested penguin.

In summary, while fisheries bycatch has been suggested as a potential source of mortality to the Fiordland crested penguin, the best available information leads us to conclude that this is not a threat to this species. There is a low-level potential for oil spill events to impact this species, but the wide dispersal of this species along inaccessible and protected coastlines leads us to conclude that potential oil spills are not a threat to the Fiordland crested penguin. Therefore, we find that other natural or manmade factors are not a threat to the species.

Fiordland Crested Penguin Finding

The primary documented threat to the Fiordland crested penguin is predation by introduced mammalian and avian predators within the species' breeding range. We are only aware of one small breeding location that is known to be free of predators. The impact of predators is evidenced by the major historical decline of the Fiordland crested penguin during the period of invasion by these predators of the South Island of New Zealand. Historical data from about 1890 cites thousands of Fiordland crested penguins in areas where current surveys find colonies of only 100 or fewer. Even though this species is poorly known, an exhaustive multi-year survey effort documented current low population numbers. Recent declines at Open Bay and Solander Islands have been documented as resulting from weka predation. The Fiordland crested penguin is a remote and hard-to-study species. However, in observing the impact of predators on other similar naïve, New Zealand penguins, such as the yellow-eyed (Darby and Seddon 1990, p. 45) and the white-flippered penguin (Challies and Burleigh 2004, p. 4), one can assume that predators would have a similar impact on Fiordland crested penguins.

In considering the foreseeable future as it relates to the status of the Fiordland crested penguin, we considered the threats acting on the species, as well as population trends. We considered the historical data to identify any relevant existing trends that might allow for reliable prediction of the future (in the form of extrapolating the trends).

New Zealand laws and the bylaws of its national parks, which encompass the majority of the range of the Fiordland crested penguin, institute provisions to "as far as possible" protect this species and to seek eradication of nonnative invasive species. Unfortunately, while complete eradication of predators, such as weka, in isolated island habitats (e.g., Solander Island), may be possible, removal of the introduced mammalian predators now known to be widespread in mainland Fiordland National Park is an extremely difficult, if not impossible, task. Similarly, physical protection of some breeding groups from predation, as has been done for species such as the yellow-eyed and white-flippered penguins, is impractical for the Fiordland crested penguin. For other penguin species located in more accessible and more restricted ranges, the task of predator control has been undertaken at levels of effort meaningful to the protection of those species. For this remote and widely dispersed species, predator control has only been undertaken on a limited basis, and we have no reason to believe this threat to the Fiordland crested penguin will be ameliorated in the foreseeable future.

The threat of human disturbance is present in those areas of the range most accessible to human habitation, but could increase as tourism activities become more widespread in the region. While efforts to control this threat have been undertaken, we have no information that allows us to conclude this threat will be alleviated for the Fiordland crested penguin in the foreseeable future.

The overall population of the Fiordland crested penguin is small (2,500–3,000 pairs) and reported to be declining (Ellis *et al.* 2007, p. 6). The ongoing pressure of predation by introduced mammalian and avian species on this endemic species over the next few decades, with little possibility of significant anti-predator intervention, and the potential for human disturbance to impact breeding populations, leads us to find that the Fiordland crested penguin is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Significant Portion of the Range Analysis

Having determined that the Fiordland crested penguin is likely to become in danger of extinction within the foreseeable future throughout all of its range, we must consider whether there are any significant portions of its range where the species is in danger of extinction now.

Fiordland crested penguins breed in widely dispersed small colonies along the convoluted and inaccessible southwest coast of the western side of South Island, New Zealand, and adjacent offshore islands southwards from Bruce Bay, including Stewart Island, Solander Island, and Codfish Island. There are a total of 2,500 to 3,000 breeding pairs throughout its range. In our previous five-factor analyses, we found that threats from human disturbance and inadequacy of regulatory mechanisms have similar impacts on both island and mainland portions of the range. We also found that a primary threat to the Fiordland crested penguin is predation by introduced birds on islands and introduced mammals on the mainland. Major portions of this species' range are in Fiordland National Park and Rakiura National Park, and on Stewart Island and adjacent islands. The Fiordland National Park Management Plan reported that nesting success of breeding pairs at island sites was greater than at mainland sites (88 and 55 percent, respectively). This led us to consider whether the threats in the mainland portion of the range may cause this portion of the range to be in danger of extinction now. While the eradication of predators, such as weka, in isolated island habitats may be possible, removal of the widespread introduced mammalian predators on the mainland may be extremely difficult, if not impossible. However, on the mainland, the nests are widely distributed, and we believe therefore are somewhat buffered from predators. Although the predation rate is greater than that of other species (Gustafson 2005, p. 2), the mainland population has been able to persist and is not currently in danger of extinction. While the threat of introduced predators is greater on the mainland, the population is being managed to some extent, and the threats do not rise to the level that the mainland population is in imminent danger of extinction. Due to the ability of the mainland population to persist, we find that there is not substantial information to conclude that the species in the mainland portion of its range may currently be in danger of extinction.

As a result, while the best scientific and commercial data available allows us to make a determination as to the rangewide status of the Fiordland crested penguin, we have determined that there are no significant portions of the range in which the species is currently in danger of extinction. The species is widely distributed throughout its range and current threats do not put the species in immediate danger of extinction. In conclusion, we have determined that there are no significant portions of the range in which the species is currently in danger of extinction. Therefore, we are listing the Fiordland crested penguin as threatened throughout all of its range under the Act.

Humboldt Penguin *(Spheniscus humboldti)*

Background

The Humboldt penguin is endemic to the west coast of South America from Foca Island (5°12'0"S) in northern Peru to the Puñihuil Islands near Chiloe, Chile (42 °S) (Araya *et al.* 2000, p. 1). It breeds on islands off the coasts of both Peru and Chile. It is a congener (within the same genus) of the African penguin and has similar life history and ecological traits.

Humboldt penguins historically bred on guano islands off the coast of Peru and Chile (Araya *et al.* 2000, p. 1). Prior to human mining of guano for fertilizer, the Humboldt penguin's primary nesting habitat was in burrows tunneled into the deep guano substrate on offshore islands. While the guano is produced primarily by three other species (the Guanay cormorant (*Phalacrocorax bouganvillii*), the Peruvian booby (*Sula variegate*), and Peruvian pelican (*Pelecanus thagus*)), Humboldt penguins depend on these burrows for shelter from the heat and from predators. With the intensive harvest of guano over the last century and a half in both countries, Humboldt penguins have been forced to nest out in the open or seek shelter in caves or under vegetation (Paredes and Zavalga 2001, pp. 199–205).

The distribution of the Humboldt penguin is very closely associated with the Humboldt (Peruvian) current. The upwelling of cold, highly productive waters off the coast of Peru provides a continuous food source to vast schools of fish and large seabird populations (Hays 1986, p. 170). In the Chilean system to the south, upwelling is lighter and occurs more seasonally than in the Peruvian system (Simeone *et al.* 2002, p. 44). In all regions, Humboldt penguins feed primarily on schooling fish such as the anchovy (*Engraulis ringens*), Auracanian herring (*Strangomera bentincki*), silversides (*Odontesthes regia*), garfish (*Scomberesox saurus)* (Herling *et al.* 2005, p. 21), and Pacific sardine (*Sardinops sagax*) (Simeone *et al.* 2002, p. 47). Depending on the location and the year, the proportion of each of these species in the diet varies.

Periodic failure of the upwelling and its impact on schooling fish and fisheries off Peru and Ecuador were the first recorded and signature phenomena of El Niño Southern Oscillation events (ENSO). El Niño events occur irregularly every 2–7 years (National Oceanic and Atmospheric Administration (NOAA) 2007, p. 4). This periodic warming of sea surface temperatures and consequent upwelling failure affects primary productivity and the entire food web of the coastal ecosystem. Anchovy and sardine populations are especially impacted, and these are the major diet of Humboldt penguins. During El Niño events, seabirds, fish, and marine mammals experience reduced survival and reproductive success, as well as population crashes (Hays 1986, p. 170).

Given the north-south distribution of the Humboldt penguin along the Peruvian and Chilean coasts, researchers have looked for variation in breeding and foraging along this climatic gradient (Simeone *et al.* 2002, pp. 43–50). In dry Peruvian breeding areas, where upwelling provides a constant food source, penguins nest throughout the year with two well-defined peaks in breeding in the autumn and spring. Adults remain near the colony all year. Further south, in northern and north-central Chile, the birds follow the same pattern, despite stronger seasonal differences in weather (Simeone *et al.* 2002, pp. 48–49). They also attempt to breed twice a year, but the autumn breeding event is regularly disrupted by rains more typical at that latitude, and there is high reproductive failure. Adults in the southern extent of the range (south-central Chile) leave the colonies in winter, presumably after abandoning nesting efforts (Simeone *et al.* 2002, p. 47). Peruvian and northern Chilean colonies are only impacted by rains and flooding during El Niño years, and during those years, nesting attempts are reduced as food supplies shift and adults forage farther away from nesting sites (Culik *et al.* 2000, p. 2317).

The distribution of colonies within the breeding range of the Humboldt penguin in Peru has shifted south in recent years. This shift may be in response to a number of factors:

(1) El Niño events in which prey distribution has been shown to move to the south (Culik *et al.* 2000, p. 2311);

(2) Increasing human pressure in central coastal areas;

(3) Long-term changes in prey distribution (Paredes *et al.* 2003, p. 135); or

(4) Overall increases in sea surface temperature.

Modinger (1998, p. 67) estimated that historically there may have been a million Humboldt penguins in the Humboldt Current. By 1936, there was already evidence of major population declines and of breeding colonies made precarious by the harvest of guano from over 100 Peruvian islands (Araya *et al.* 2000, p. 1, Modinger *et al.* 1998, p. 1; Ellis *et al.* 2007, p. 7).

Estimates of the population in Peru have fluctuated in recent history. They were estimated to be between 3,500 and 7,000 in 1981, with a subsequent reported decrease to 2,100 to 3,000 individuals after the 1982–1983 El Niño event. In 1996, there were reported to be 5,500 individuals, and after the strong 1997–1998 El Niño event, fewer than 5,000. In Peru, population surveys in the southern portion of the range in 2006 found 41 percent more penguins than in 2004, increasing estimates for that area from 3,100 individuals to 4,390 and supporting an overall population estimate for Peru of 5,000 individuals (Instituto Nacional de Recursos Naturales (INRENA) 2007, p. 1; IMARPE 2007, p. 1).

In Chile, researchers estimated there were 7,500 breeding Humboldt penguins in Chile in 1995–1996 (Ellis *et al.* 1998, p. 99; Luna-Jorguera *et al.* 2000, p. 508). This estimate for Chile was significantly revised following surveys conducted in 2002 and 2003 at Isla Chanaral, one of the most important breeding islands for the Humboldt penguin (Mattern *et al.* 2004, p. 373). Mattern *et al.* counted 22,000 adult penguins, 3,600 chicks, and 117 juveniles at that island in 2003 (2004, p. 373). While 6,000 breeding birds had been recorded in the 1980s, counts after 1985 had never exceeded 2,500 breeding birds (Ellis *et al.* 1998, p. 99). The authors indicated that rather than representing a sudden population increase, the discrepancy may be a result of systematic underestimates in eight previous counts at Isla Chanaral, which were all conducted using a uniform methodology, but may not have considered the absence of penguins due to breeding versus nonbreeding season in conducting the population estimate. Just to the south of this study area in the Coquimbo region, Luna-Jorguera *et al.* counted a total of 10,300 penguins in on-land and at-sea counts conducted in 1999 (2000, p. 506). They found numbers higher than the most recent previous census, which had estimated only 1,050 individuals in the Coquimbo region (Luna-Jorguera *et al.* 2000, p. 508). In 2007, Ellis *et al.* (2007, p. 7), estimated that there were approximately 30,000 to 35,000 individuals in the Chilean population. Other than the overall rangewide figures for the species presented by Ellis *et al.* (2007, p. 7), no current comprehensive estimate of the total number of penguins in Chile exists.

There are varied total population estimates for this species. As recently as 2007, Ellis *et al.* (p. 7) reported a total population of 41,000 to 47,000 individuals. However, BirdLife International currently indicates that there is an estimated total population of 3,000 to 12,000 (2009, p. 2). BLI is the official IUCN Red List Authority for birds. BLI supplies information for all of the world's birds to the IUCN Red List each year. The 2007 IUCN Red List (BirdLife International 2007, p. 1) categorizes the Humboldt penguin as "Vulnerable" on the basis of 30 to 49 percent declines over the past three generations and predicted over three generations into the future. Thus, because BLI is the accepted authority for IUCN's Red List for birds, we accept the estimate of the total population to be between 3,000 and 12,000 birds.

Summary of Factors Affecting the Humboldt Penguin

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Humboldt Penguin's Habitat or Range

The habitat of the Humboldt penguin consists of terrestrial breeding and molting sites and the marine environment, which serves as a foraging range year-round.

Terrestrial Habitat

Modification of their terrestrial breeding habitat is a continuing threat to Humboldt penguins. Humboldt penguin breeding islands were, and continue to be, a source of guano for the fertilizer industry and have been exploited since 1840 in both Peru and Chile. Between 1840 and 1880, Peru exported an estimated 12.7 million T (11.5 t) of guano from its islands (Cushman 2007, p. 1). Throughout the past century, Peru has managed the industry through a variety of political and ecological conflicts, including the devastating impacts of El Niño on populations of guano-producing birds and the competition between the fishing industry and the seabird populations that are so valuable to guano production. After 1915, caretakers of the islands routinely hunted penguins for food even as their guano nesting substrate was removed, which resulted in penguins being virtually eliminated from the guano islands (Cushman 2007, p. 11). Harvest of guano continues on a small scale today and is managed by Proyecto Especial de Promocion del Aprovechamiento de Abonos Provenientes de Aves (PROABONOS), a small government company that produces fertilizer for organic farming (Cushman 2007, p. 24).

Reports from 1936 described completely denuded guano islands and indicated that by 1936, Humboldt penguin populations had undergone a vast decline throughout the range (Ellis *et al*. 1998, p. 97). Guano, which was historically many meters deep, was initially harvested down to the substrate level. Then, once the primary guano-producing birds had produced another ankle-deep layer, it was harvested again. The Humboldt penguins, which formerly burrowed into the abundant guano, were deprived of their primary nesting substrate and forced to nest in the open, where they are more susceptible to heat stress. In addition, their eggs and chicks are more vulnerable to predators. Alternatively, they can be forced to resort to more precarious nesting sites (Ellis *et al*. 1998, p. 97).

Paredes and Zavalga (2001, pp. 199–205) investigated the importance of guano as a nesting substrate and found that Humboldt penguins at Punta San Juan, Peru, where guano harvest has ceased, preferred to nest in high-elevation sites where there was adequate guano available for burrow excavation. As guano depth increased in the absence of harvest, the number of penguins nesting in burrows increased. Penguins using burrows on cliff tops had higher breeding success than penguins breeding in the open, illustrating the impact of loss of guano substrate on the survival of Humboldt penguin populations.

Guano harvesting continues on Peruvian points and islands under government control. The fisheries agency, Instituto del Mar del Peru (IMARPE), is working with the parastatal (government-owned) guano extraction company, PROABONOS, to limit the impacts of guano extraction on penguins at certain colonies to ensure that harvest is conducted outside the breeding season and that workers are restricted from disturbing penguins (IMARPE 2007, p. 2). In 1998, the Wildlife Conservation Society and PROABONOS fenced off penguin rookeries, which successfully prevented guano harvesters from harming wildlife (Paredes *et al*. p. 136).

Two major penguin colonies at Punta San Juan and Pachacamac Island are in guano bird reserves. They are under the management and protection of the guano extraction agency, which has built walls to keep out people and predators (UNEP World Conservation Monitoring Center (UNEP WCMC) 2003, p. 9). However, guano extraction is still listed as a moderate threat to some island populations within the Reserva Nacional de Paracas (Lleellish *et al*. 2006, p. 4), and illegal guano extraction is listed by the Peruvian natural resource agency, Instituto Nacional de Recursos Naturales (INRENA), as one of three primary threats to the Humboldt penguin in Peru (INRENA 2007, p. 2). The penguin Conservation Assessment and Management Plan (CAMP) (Ellis *et al*. 1998, p. 101) recommended that the harvest of guano in Peru be regulated in order to preserve nesting habitat and reduce disturbance during the nesting seasons. Although guano harvest is still a concern in Peru, guano harvest is reported to have ceased in Chile (UNEP WCMC 2003, p. 6).

Historical declines have resulted from the destruction of Humboldt penguin's nesting substrate by guano collection, and this loss of nesting habitat continues to impact the breeding success of the species in Peru. Although guano harvest is being managed to some extent, we have no reason to believe the level of guano collection will change in the foreseeable future. We conclude, on the basis of the extent and severity of habitat modification and exploitation throughout the range of the Humboldt penguin in both countries over the past 170 years, and on the basis of ongoing guano extraction in Peru, that modification of the terrestrial breeding habitat is a threat to the survival of the Humboldt penguin.

Marine Habitat

With respect to modification of the marine habitat of the Humboldt penguin, periodic El Niño events have been shown to have significant effects on the marine environment on which Humboldt penguins depend, because they reduce the available food sources for this species. These El Niño events are considered to be the main marine perturbation for the Humboldt penguin impacting penguin colonies in Peru (Hays 1986, pp. 169–180; Ellis *et al*. 1998, p. 101; INRENA 2007, p. 1) and Chile (Simeone *et al*. 2002, p. 43). The strength and duration of El Nino events has increased since the 1970s. The 1997–1998 event was the most extreme on record (Trenberth *et al*. 2007, p. 288). The Humboldt Penguin Population and Habitat Viability Assessment (Araya *et al*. 2000, pp. 7–8) concluded that, even without El Nino and other impacts, documented rates of reproductive success and survival would cause declines in the Chilean populations. In the absence of other human impacts, El Nino events in Chile alone were projected to lead to 2.3 to 4.4 percent annual population declines. Peruvian population data for this species found an overall population decline of 65 percent during the 1982–83 El Niño event (Hays 1986, p. 169).

While we have not found comparable documentation of the impact of the 1997–1998 event in Peru, few birds were recorded breeding at guano bird reserves in 1998. At one colony, Punta San Juan, the number of breeding individuals appears to have declined by as much as 75 percent between 1996 and 1999 before a subsequent rebound (Paredes *et al*. 2003, p. 135). This suggests that a similar level of impact from a single El Niño event in the future could reduce current Peruvian populations from 5,000 birds to 1,250 - 1,750 birds. Cyclical El Nino events cause high mortality among seabirds, but there is also high selection pressure on Humboldt Current seabird populations such as the Humboldt penguin to increase rapidly in numbers after each event (Ellis *et al*. 1998, p. 101). Nonetheless, with strengthening El Nino events, reduced Humboldt penguin population numbers, and the compounding influence of other threat factors, such as ongoing competition with commercial fisheries for food sources which are discussed below under Factor E, the resiliency of Humboldt penguins to recover from cyclical El Nino events is highly likely to be reduced from historical times (Ellis *et al.* 1998, p. 101).

On the basis of this analysis, we find that the present and threatened destruction, modification, or curtailment of both its terrestrial and marine habitats, primarily due to El Niño events and guano extraction, are threats to the Humboldt penguin.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

While hunting of Humboldt penguins for food and bait and harvesting of their eggs have been long established on the coasts of Chile and Peru, it is not clear how much hunting persists today. At Pajaros Island in Chile, Humboldt penguins are sometimes hunted for human consumption or for use as bait in the crab fishery. At the Puñihuil Islands farther south, they have also been hunted on occasion for use as crab bait (Simeone *et al.* 2003, p. 328; Simeone and Schlatter 1998, p. 420). Paredes *et al.* reported that as fishing occurs more frequently in the proximity of penguin rookeries, fishermen have begun to take penguins for food in Peru (2003, p. 136). Cheney (UNEP WCMC 2003, p. 6) reported an observation of a fisherman taking 150 penguins to feed a party. In 1995, egg harvest was listed as the primary threat to Chilean populations (UNEP WCMC 2003, p. 6), but recent information does not indicate whether that practice continues today. Paredes *et al.* (2003, p. 136) also reported that guano harvesters supplement their meager incomes and diets through the collection of eggs and chicks, although the fisheries agency, IMARPE, is working with PROABONOS to restrict workers from disturbing penguins (IMARPE 2007, p. 2). On the basis of this information, we conclude that localized intentional harvest may be ongoing. We have no basis to evaluate the effectiveness of reported efforts to control this harvest.

In 1981, the Humboldt penguin was listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES regulates international trade in order to ensure that trade of the species is compatible with the species' survival. International trade in specimens of Appendix-I species is authorized through permits or certificates under certain circumstances, including verification that trade will not be detrimental to the survival of the species in the wild. It also must be determined that the specimen (live animal, part, or product) was legally acquired, and that the activity is not for primarily commercial purposes. (UNEP-WCMC 2010, p. 1). Prior to 1985, it was estimated that 9,264 Humboldt penguins had been exported to several zoos around the world within a period of 32 years. Between the time the species was listed under CITES in 1981 and 2008, there were 937 live CITES-permitted Humboldt penguin international shipments (UNEP-WCMC 2010, p. 1). Only one of these live shipments (from Peru to Venezuela) indicated that its origin was from the wild; the other shipments all indicated that they were of captive origin. Chile and Peru's exports are included in these numbers. Peru exported 48 live animals for educational and zoological purposes; Chile exported 10 live animals in 1981 and none since then. We believe that this limited amount of international trade, controlled via valid CITES permits, is not a threat to the species. Because commercial exportation of Humboldt penguins from Peru or Chile is now prohibited (Ellis *et al.* 1998, p. 101, UNEP 2003, p. 8), export is no longer a threat to the species.

Tourism has been identified as a potential threat to the Humboldt penguin. Since the 1990 designation of the Humboldt National Reserve, which includes the islands of Damas, Choros, and Chanaral in Chile, tourism has increased rapidly but with little regulation (Ellenberg *et al.* 2006, p. 97). Ellenberg *et al.* (2006, p. 99) found that Humboldt penguin breeding success varied with levels of tourism on these three islands. Breeding success was very low at Damas Island, the most tourist accessible island, which saw over 10,000 visitors in 2003. Better breeding success was observed at Choros Island, a less accessible island which saw fewer than 1,000 visitors. The highest breeding success was observed at the remote and largest Chanaral Island colony, where tourist access was negligible. Unlike their congener (species within the same genus) the Magellanic penguin (*Spheniscus magellanicus*), Humboldt penguins reacted to human presence and displayed little habituation potential. Their reactions indicate that there is a strong need for tourism guidelines for this species (Ellenberg *et al.* 2006, p. 103). Researchers described nest destruction by tourists at Puñihuil Island, a popular unregulated tourist destination in southern Chile (Simeone and Schlatter 1998, p. 420). Both the attractiveness of the penguins for tourism and the potential for increased impacts from human disturbance stem from the coincidence of the prime tourist season with the Humboldt penguin's spring and summer breeding season.

Tourism has increased rapidly and with little regulation in the Humboldt National Reserve and has caused nest destruction at Puñihuil Island in Chile. In Peru, tourism is reported to be a minimal to mid-level threat at Reserva Nacional de Paracas (Lleellish *et al.* 2006, p. 4). Because Humboldt penguins are extremely sensitive to the presence of humans, the species' breeding success is impacted by increased levels of tourism. Since the prime tourist season coincides with the species' spring and summer breeding season, we conclude that insufficiently regulated tourism is a threat to the species.

Other human activities may disturb penguins. For example, fishermen hunting European rabbits (*Oryctolagus cuniculus*) disturbed penguins at Choros Island (Simeone *et al.* 2003, p. 328), but we do not conclude that this activity has occurred at a scale that represents a threat to the Humboldt penguin.

We have identified intentional take (hunting of Humboldt penguins for food and bait and harvesting of their eggs) and unregulated tourism as threats to Humboldt penguins. Therefore, we find that overutilization for commercial, recreational, scientific, or educational purposes is a threat to the Humboldt penguin.

Factor C. Disease or Predation

There is no information to indicate that disease is a threat to the Humboldt penguin.

Various types of predation on Humboldt penguins have been documented. Simeone *et al.* (2003, p. 331) reported that the presence of rats, rabbits, goats, and cats have been documented on islands along the Chilean coast, but their actual impacts on the Humboldt penguin population are unknown. In Chile, "rats were observed at Pájaros, Cachagua, and Pájaros Niño [Islands]. At Pájaros Island, rats were present in large numbers and were observed to prey on penguin eggs and chicks" (Simeone *et al.* 2003, p. 328). Rats and cats are a significant threat because they eat eggs and chicks. Luna-Jorquera *et al.* observed vampire bats preying upon juvenile Humboldt penguins (1995, p. 471); however, there have been no other similar reports since 1995. Foxes were reported to prey on Humboldt penguins at Pan de Azucar National Park in Chile (Culik 2009 pers. comm.). Limited conclusive data are available for the Humboldt penguin; however, based on studies of other species, it is very likely that predation is a significant threat to the species. Simeone and Schlatter found that the threat of predation has been shown to result in rapid population declines in the past and that this threat is likely to continue in the foreseeable future due to the lack of control efforts to eradicate these predators (UNEP 2003, p. 7). Therefore, on the basis of the best available information, we conclude that predation is a threat to the Humboldt penguin.

Factor D. Inadequacy of Existing Regulatory Mechanisms

The Humboldt penguin is listed as "endangered" in Peru, the highest threat category under Peruvian legislation. Take, capture, transport, trade, and export are prohibited except for scientific or cultural purposes (IMARPE 2007, p. 1; UNEP WCMC 2003, p. 8). Most breeding sites are protected by designated areas. The principal breeding colonies are legally protected by PROABONOS, the institute which manages guano extraction. The Reserva Nacional de Paracas protects an area of 1,293 mi^2 (3,350 km^2) of the coastal marine ecosystem. In 2006, 1,375 penguins were observed in this reserve (Lleellish *et al.* 2006, pp. 5–6). However, patrols of this area are inadequate to police illegal activities such as dynamite fishing (Lleellish *et al.* 2006, p. 4).

In 2008, the Chilean National Commission for the Environment (CONAMA) listed this species as vulnerable. Other protections include a 30–year moratorium on hunting and capture of Humboldt penguins; and at least four major colonies are protected by Federal law. In fact, most terrestrial sites where the species occurs are within the national system of protected areas (UNEP WCMC 2003, p. 8).

The species is listed in Appendix I of CITES and in Appendix I of the Convention on Migratory Species. Refer to the discussion of the application of CITES under Factor B with respect to international trade. Because commercial exportation of Humboldt penguins from Peru or Chile is not only prohibited (Ellis *et al.* 1998, p. 101, UNEP 2003, p. 8), but also regulated under CITES, export is not a threat to the species.

While legal protections are in place for the Humboldt penguin in both Chile and Peru, in general it is reported that enforcement of such laws is limited due to inadequate resources and the remote location of penguin colonies (UNEP WCMC 2003, p. 8). The UNEP WCMC Report on the Status of Humboldt Penguins concluded that little has been done to establish fishing-free zones and that there has been slow progress in preventing penguins from being caught in fishing nets. Majluf *et al.* (2002, p. 1342) stated, "There is currently no management of artesanal [sic] gill-net fisheries in Peru, except for restrictions on retaining cetaceans and penguins. Even these regulations are difficult to enforce in remote and isolated ports such as San Juan." Therefore, regulation is still inadequate with respect to fisheries bycatch.

Both countries have national authorities and national contingency plans for oil spill responses. Chile has the capability to respond to Tier One (small spills with no outside intervention) and Tier Two oil spill events (larger spills requiring additional outside resources and manpower) (International Tankers Owners Pollution Federation Limited (ITOPF) 2003, p. 2). Although Peru responded well to an oil spill in 2008 near Paracas National Reserve, as of 2009, Peru was not listed as having significant capability to respond to oil spill events (ITOPF 2009, p. 1). Based on the ability of Chile to respond to threats, Peru's successful response in 2008, and the location of Humboldt penguins in an area where they are not likely to be exposed to many oil spills, we find that oil spills are not a threat to the Humboldt penguin.

As indicated under factor B, tourism has been identified as a threat to the Humboldt penguin. Since the 1990 designation of the Humboldt National Reserve in Chile, tourism has increased rapidly with little regulation (Ellenberg *et al.* 2006, p. 97). Humboldt penguin breeding success varied based on levels of tourism on these three islands. Breeding success was very low at Damas Island, the most tourist accessible island, which saw over 10,000 visitors in 2003. Better breeding success was observed at Choros Island, a less accessible island which saw fewer than 1,000 visitors. The highest breeding success was observed at the remote and largest Chanaral Island colony, where tourist access was negligible. Humboldt penguins reacted to human presence and displayed little habituation potential. Their reactions indicate that there is a strong need for tourism guidelines for this species (Ellenberg *et al.* 2006, p. 103). Researchers described nest destruction by tourists at Puñihuil Island, a popular unregulated tourist destination in southern Chile (Simeone and Schlatter 1998, p. 420). Both the attractiveness of the penguins for tourism and the potential for increased impacts from human disturbance stem from the coincidence of the prime tourist season with the Humboldt penguin's spring and summer breeding season.

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We find that inadequacy of existing regulatory mechanisms, particularly due to the lack of enforcement of existing prohibitions related to fishing methods and management of fisheries bycatch, and to insufficiently regulated tourism, is a threat to the Humboldt penguin.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

Both large-scale commercial fisheries and small local fisheries compete for the primary food of the Humboldt penguin throughout its range (BirdLife International 2007, p. 4; Ellis *et al.* 1998, p. 100; Herling *et al.* 2005, p. 23; Hennicke and Culik 2005, p. 178). While El Niño events (see Factor A) cause severe fluctuations in Humboldt penguin numbers, overfishing and entanglement (see Factor E) are identified as steady contributors to underlying long-term declines (BirdLife International 2007, p. 4). Anchovies are a primary component of Humboldt penguins' diet. The anchovy fishery in Peru collapsed in the 1970s due to a high number of catches and the overcapacity of fishing fleets, factors that were exacerbated by the effects of the 1972–1973 El Niño event. Twenty years passed before it became clear that this fishery had recovered (Food and Agriculture Organization (FAO) 2007, p. 2). These recovered stocks continue to be significantly impacted by major El Niño events, but have rebounded more quickly recently. Peru reported anchovy catches of 8.64 million T (9.6 million t) in 2000, and 5.76 million T (6.4 million t) in 2001 (FAO 2007, p. 2). El Niño events have caused periodic crashes of the food supply of Humboldt penguins in Peru and Chile in both the historic and recent past. El Niño events, which occur irregularly every 2–7 years, have increased in frequency and intensity in recent years. Commercial fishing in combination with El Niño events has contributed to the historic declines of Humboldt penguins, and the identified threat of El Niño will interact with fisheries during future El Niño episodes. These events in combination with competition for prey from fisheries are likely to impact Humboldt penguins more frequently and more severely in the foreseeable future. Chile reported fish catches of 1.25 million T (1.4 million t) in 2004 (FAO 2006, p. 4). In Chile, local-level commercial extraction of specific fish species has reduced those species in the diet of penguins, and fisheries' extraction has the potential to harm Humboldt penguins if overfishing occurs (Herling *et al.* 2005, p. 23). Researchers tracking the foraging effort of penguins in northern Chile concluded that even small variations in food supply, related to small changes in sea-surface temperature, led to increased foraging time (Culik and Luna-Jorquera (1997, p. 555) and Hennicke and Culik (2005, p. 178). They concluded that Humboldt penguins have high energetic costs to obtain food even in non-El Niño years. The synergistic actions of these fisheries with El Niño events can be devastating to the Humboldt penguin, since anchovies are one of the primary food sources for the species. The establishment of no-fishing zones encompassing the foraging range around the breeding area at Pan de Azucar Island has been recommended to buffer the species from possible catastrophic effects of future El Niño events. Competition between local fishermen (both for commercial and noncommercial consumption) and penguins for local pelagic fish, particularly anchovies (Herling *et al.* 2005, p. 21) exists. The farther penguins have to travel for food, the more energy they expend (Davis 2001, p. 9) which leads to a reduced ability to survive. Herling *et al.* calculated that 1,400 T (1,272 t) of fish are required in a breeding season for 40,000 penguins. If fish are unavailable due to competition from fisheries, this could lead to decreased reproductive capabilities and starvation. (Herling *et al.* 2005, p. 21). Chile is monitoring the fisheries in relation to El Niño episodes and Humboldt penguins. However, on the basis of the best available information we conclude that competition for prey from commercial or local fisheries is currently a threat to the Humboldt penguin.

We find that the synergistic effects of El Niño combined with competition for prey from commercial or local fisheries is likely to be a threat to the Humboldt penguin within the foreseeable future by causing a reduction in food availability for the penguins and an increase in energy expenditure.

Incidental take by fishing operations has been identified to be one of the most significant threat to Humboldt penguins (BLI 2010, p. 1). The Government of Peru lists incidental take by fisheries in fishing nets as one of the major sources of penguin mortality (IMARPE 2007, p. 2). Paredes *et al.* (2003, p. 135) attribute increased human disturbance to the changes in distribution of penguin colonies southward in Peru. There are now fewer penguins on the central coastal area and more to the south. Reports from Chile indicated a similar level of impact on the species (Majluf *et al.* 2002, pp. 1338–1343). In Peru, the expansion of local-scale fisheries and the switching to new areas and fish species is occurring. Local fisheries are unable to compete with larger commercial operations, bringing humans and penguins into increasing contact, and subsequently increasing penguin mortality due to entanglement in fishing nets (Paredes *et al.* 2003, p. 135). Between 1991 and 1998, Majluf *et al.* (2002, pp. 1338–1343) recorded 922 deaths in fishing nets out of a population of approximately 4,000 breeding Humboldt penguins at Punta San Juan, Peru. Take was highly variable between years, with the greatest incidental mortality occurring when surface set drift gill nets were being used to catch cojinovas (*Seriolella violace),* a species that declined during the course of the study. A subsequent study found that the risk of entanglement is highest when surface nets are set at night (Taylor *et al.* 2002, p. 706). This level of incidental take was found to be unsustainable even without factoring in periodic El Niño impacts.

In Chile, Simeone *et al.* (1999, pp. 157–161) recorded that 605 Humboldt penguins drowned in drift gill nets set for corvina (*Cilus gilberti*) in the Valparaiso region of central Chile between 1991 and 1996. Birds pursuing anchovies and sardines were apparently unable to see the transparent nets in their path and were entangled and drowned. These mortalities occurred outside of the breeding season when penguins forage in large aggregations and probably involved birds originating from beyond small, local colonies. The deaths recorded represent underestimates of rangewide mortality—the authors only studied one of four major regions where corvina fishing occurred. Incidental mortality from such fishing operations is thought to affect Humboldt penguins throughout the species' range (Wallace *et al.* 1999, p. 442). Therefore, we conclude that fisheries bycatch is a threat to the Humboldt penguin.

Fishing with explosives, such as dynamite, is listed by INRENA as one of three major threats to Humboldt penguins in Peru (INRENA 2007, p. 2). The use of explosives is recurrent in the marine area around Reserva Nacional de Paracas, the primary center of population for penguins in Peru. Explosives use is especially prevalent in the southern zone, an area that contains more than 73 percent of the population, but does not receive as thorough patrolling as the north (Lleellish *et al.* 2006, p. 4).

Oil and chemical spills can have direct effects on the Humboldt penguin. The range of the species encompasses major industrial ports along the coast of both Chile and Peru. Approximately 100,000 barrels per day of crude oil pass through the coastal waters from the tip of South America to Panama (ITOPF 2003, p. 1), with over 1,000 tankers calling annually at ports in the entire region. Major spill events in Chile have been limited to the area from the Straits of Magellan to the south of the range of the Humboldt penguin, and no major events have been recorded for Peru (ITOPF 2000a, p. 2; ITOPF 2000b, p. 2). On May 25, 2007, about 92,400 gallons (350,000 liters) of crude oil leaked into San Vicente Bay in Talcuhuano, near Concepcion, Chile, during offloading of fuel by the vessel *New Constellation*, with impacts on sea lions and seabirds, including Humboldt penguins (Equipo Ciudano 2007, p. 1). A similar spill of 2,206 T (2,000 t) of crude oil occurred at an oil terminal off Lima in 1984, severely polluting beaches there (ITOPF 2000b, p. 3). As noted in Factor D, Chile and Peru have limited ability to handle spill cleanup.

While there is a possibility of oil spill impacts as a result of incidents along the Peruvian or Chilean coast, we find a number of factors mitigate against a finding that oil spills are a threat to the species. There is little history of spill events in the region, and the breeding colonies of Humboldt penguin are widely dispersed along a very long coastline. In addition, the Humboldt penguin's distribution does not encompass the southern tip of South America where the risk of oil spill is greatest. On this basis, we conclude that oil spill impacts are not a threat to the survival of the Humboldt penguin in any portion of its range.

Other than El Niño events, which were identified as a threat factor and discussed under factor A, the best available information does not indicate that climate change is likely to cause this species to become in danger of extinction now or in the foreseeable future. We rely primarily on synthesis documents (e.g., IPCC 2007) that present the consensus view of a very large number of experts on climate change from around the world. We have found that these synthesis reports, as well as the scientific papers used in those reports or resulting from those reports, represent the best available scientific information we can use to inform our decision. Gille (2002, p. 1276) found that ocean warming did occur in the 1950s and 1960s, but that it leveled off in the 1980s and 1990s. Climate-change scenarios estimate that the mean air temperature could increase by more than 3 °C (5.4 °F) by 2100 (IPCC 2007, p. 46). Overall, there was an increase in ocean water temperature in the Southern Hemisphere over the past 50 years. Additionally, during 2090-2099, precipitation is predicted to increase across the sub-Antarctic and Antarctic region, with a greater than 20 percent increase predicted for the Antarctic continent. Ocean warming and sea level rise may occur based on increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level ((IPCC 2007, p. 30). However, although the models above make general predictions at a large scale, we know of no climate change models currently available that make meaningful predictions of climate change at a smaller scale that includes the range of the Humboldt penguin. Given this lack of information, we are unable to conclude that climate change, sea level rise, or ocean warming other than El Nino events, are a threat to the species.

The Humboldt penguin is vulnerable to various threats under Factor E. In summary, we find that the synergistic effects of El Niño combined with competition for prey from commercial or local fisheries (competition with fishermen in times of reduced food availability), fisheries bycatch (catch in gillnets), and fishing with explosives are threats to the survival of the Humboldt penguin.

Humboldt Penguin Finding

The Humboldt penguin has decreased historically from what was believed by some to be more than a million birds in the 19th century to 41,000 to 47,000 birds today (Ellis *et al.* 1997, pp. 96-97; Ellis *et al.* 2007, p. 7.). Since 1981, the Peruvian population has fluctuated between 3,500 and 7,000 individuals, with the most recent estimate at 5,000 individuals. Estimates of the population in Chile (30,000 to 35,000 individuals) have been recently updated with improved documentation of a colony at Isla Chanaral. The increase in the population estimate is believed to be a correction of systematic undercounting that occurred for 20 years; we cannot conclude that it signifies recent population increases in Chile.

Under Factor A, we find that the present or threatened destruction, modification, or curtailment of the Humboldt penguin's habitat or range is occurring. Historical threats to terrestrial habitat, in particular the destruction of Humboldt penguin nesting substrate by guano collection, have in part been responsible for the massive historical decline of the species, and this loss of nesting habitat continues to impact the breeding success of the species. Effects of guano extraction on the current populations appear to have been reduced by designation of protected areas and management of the limited guano harvesting that still occurs. However, at guano islands the availability and quality of nesting habitat is still impacted by ongoing harvest.

The impact of El Niño events, which have caused periodic crashes of the food sources of Humboldt penguins in Peru and Chile in the historic and recent past, is a threat factor leading to declines of this species. Given reduced population sizes and the existence of other significant threats, the resiliency of the Humboldt penguin to respond to these cyclical El Nino events is greatly reduced. Such events, which occur irregularly every 2–7 years, have increased in frequency and intensity in recent years and are likely to impact Humboldt penguins more severely in the foreseeable future.

Under Factor B, we find that the species is being overutilized for commercial, recreational, scientific, or educational purposes. Harvest of Humboldt penguins for food, eggs and bait is a threat to the survival of the Humboldt penguin throughout its range. We have no reason to believe this threat will be ameliorated in the future. Tourism, if not properly managed or regulated, has the potential to impact individual colonies; therefore, we conclude that inadequately managed tourism is currently a threat to the species.

Under Factor C, on the basis of the best available information, we conclude that predation is a threat to the Humboldt penguin.

Under Factor D, there is evidence of lack of enforcement and lack of significant measures to reduce the impacts of bycatch and inadequately regulated tourism. Therefore, we find that inadequacy of existing regulatory mechanisms, particularly due to the lack of enforcement of existing prohibitions related to fishing methods and management of fisheries bycatch, along with insufficiently regulated tourism, is a threat to the Humboldt penguin.

Under Factor E, we find that other natural or manmade factors are affecting the continued existence of this species. First, the range of the Humboldt penguin along the coast of Chile and Peru does not have the same history of major spills or the same level of shipping traffic as ranges of other penguin species. Therefore, we conclude that oil spill impacts are not a threat to the survival of the Humboldt penguin. Industrial fisheries' extraction, which in conjunction with El Niño caused collapse of anchovy stocks in the 1970s, has had a historical influence on the species and contributed to its long-term decline. The recovery of fish stocks since the 1970s, however, has improved the food base of this species. Large-scale commercial fisheries and local-scale fisheries' extraction are targeting the same prey as the Humboldt penguin, which is a current threat to the species. More importantly, incidental take by fisheries operations has emerged as the most significant human-induced threat to Humboldt penguins in both Chile and Peru. Entanglement in gill nets caused significant documented mortality of Humboldt penguins in both countries in the 1990s. We have no reason to believe this will be ameliorated in the foreseeable future. Therefore, we find that ongoing threat of incidental take from fisheries bycatch and fishing with explosives are threats to the Humboldt penguin.

In summary, we find that the Humboldt penguin is likely to become in danger of extinction within the foreseeable future due to : (1) Destruction of its habitat by guano extraction; (2) high likelihood of El Niño events impacting the prey of Humboldt penguins in cyclical 2- to 7–year timeframes; (3) intentional harvest of this species for meat, eggs, and bait, and improperly managed tourism; (4) inadequacy of existing regulatory mechanisms, particularly in the area of enforcement of existing prohibitions related to fishing methods and management of fisheries bycatch and inadequately regulated tourism; (5) predation by rats and cats; and (6) incidental take from fisheries bycatch and fishing with explosives.

Distinct Population Segment (DPS)

Section 3(15) of the Act defines "species" to include "any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." To interpret and implement the DPS provisions of the Act, the Service and National Marine Fisheries Service published a Policy Regarding the Recognition of Distinct Vertebrate Population Segments in the **Federal Register** (DPS Policy) on February 7, 1996 (61 FR 4722). Under the DPS policy, three factors are considered in a decision concerning the establishment and classification of a possible DPS. These are applied similarly to both endangered and threatened wildlife.

We determine: (1) The discreteness of a population in relation to the remainder of the taxon to which it belongs; (2) the significance of the population segment to the taxon to which it belongs; and (3) the population segment's conservation status in relation to the Act's standards for listing (addition to the list), delisting (removal from the list), or reclassification (i.e., whether the population segment is endangered or threatened).

The policy first requires the Service to determine that a vertebrate population is discrete in relation to the remainder of the taxon to which it belongs. Discreteness refers to the ability to delineate a population segment from other members of a taxon based on either (1) physical, physiological, ecological, or behavioral factors, or (2) international governmental boundaries that result in significant differences in control of exploitation, management, or habitat conservation status, or regulatory mechanisms that are significant in light of section 4(a)(1)(D) of the Act—the inadequacy of existing regulatory mechanisms.

Second, if we determine that the population is discrete under one or more of the discreteness conditions, then a determination is made as to whether the population is significant to the larger taxon to which it belongs. In carrying out this examination, we consider available scientific evidence of the population's importance to the taxon to which it belongs. This consideration may include, but is not limited to the following: (1) The persistence of the population segment in an ecological setting that is unique or unusual for the taxon; (2) evidence that loss of the population segment would result in a significant gap in the range of the taxon; (3) evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside of its historic range; and (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics from other populations of the species. A population segment needs to satisfy only one of these conditions to be considered significant.

Lastly, if we determine that the population is both discrete and significant, then the policy requires an analysis of the population segment's conservation status in relation to the Act's standards for listing (addition to the list), delisting (removal from the list), or reclassification (i.e., whether the population segment is endangered or threatened).

Humboldt penguins have a continuous range from northern Peru to mid-southern Chile. We analyzed this species to determine if a DPS existed because its range spans two countries.

Discreteness Analysis

Under the DPS policy, a population segment of a vertebrate taxon may be considered discrete if it satisfies either of the following conditions: (1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors, or (2) it is delimited by international boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

With respect to discreteness criterion 1, we did not identify any marked biological boundaries between populations within that range or any differences in physical, physiological, ecological, or behavioral factors among any groups within that range. We found no reports of genetic or morphological discontinuity between any discrete segments of the population.

The range of the Humboldt penguin crosses the international boundary between Peru and Chile, which leads to evaluation of the second discreteness factor. However, in our analysis of differences between Peru and Chile in conservation status, habitat management, and regulatory mechanisms, we have found no significant differences between the two countries. In both countries, intentional take of penguins is prohibited, but some illegal take occurs. Measures to address fisheries bycatch are similar, but fisheries bycatch remains widespread. Both countries provide protection to major breeding colonies of the species. The Chilean population is more numerous, but the extent of their range is greater. Given the fact that problems in census data have only recently been corrected, we cannot conclude that Chilean Humboldt penguin population trends are different from the Peruvian trends or that conservation concerns are different. In fact, the impacts of habitat loss, the effects of El Niño, intentional take, inadequacy of regulatory mechanisms, and fisheries bycatch are concerns throughout the species' range in both countries.

Based on our analysis, we do not find that differences in conservation status or management for Humboldt penguins across the range countries are sufficient to justify the use of international boundaries to satisfy the discreteness criterion of the DPS Policy. Therefore, we have concluded that there are no population segments that satisfy the discreteness criterion of the DPS Policy. As a consequence, we could not identify any geographic areas or populations that would qualify as a DPS under our 1996 DPS Policy (61 FR 4722).

Significant Portion of the Range Analysis

Given the continuous linear range of the Humboldt penguin, which breeds from northern Peru to south-central Chile, and the distribution of colonies along that coast, no specific geographic portions of concern were immediately apparent. Recent research found that long-term gene flow is occurring between populations in Peru and Chile, but, as would be expected, it is affected by geographic distance (Schlosser *et al.* 2009, p. 839). The researchers further suggest that this species should be managed as a metapopulation rather than as separate populations.

Overall, for each factor identified as a threat, we found that threats occurred throughout the range. Terrestrial and marine habitat loss, which included the impacts of guano extraction and the effects of El Niño, intentional harvest, insufficiently regulated tourism, the inadequacy of regulatory mechanisms, and fisheries bycatch were determined to be threats throughout the Humboldt penguin's range.

In reviewing our findings, one difference within threat Factor A relates to the ongoing limited harvest of guano in Peru, while such harvest has stopped in Chile. In our finding, we indicated that both the historic and present impacts of guano extraction were a threat to the Humboldt penguin. On the basis of this difference, we considered whether the Peruvian population of Humboldt penguin may be in danger of extinction in a significant portion of its range. The information available on local harvest patterns or population trends in specific areas where guano harvest is documented does not allow us to divide the range further. The most recent 2006 estimate of the Peruvian population of the Humboldt penguin is approximately 5,000 individuals. This count includes an increase of 41 percent since 2004 in the southern portion of the range, where 80 percent of the birds are found. The overall population has fluctuated between 2,100 and 7,000 individuals since 1981, with fluctuations attributed to response to El Niño events. While the population of Humboldt penguins in Peru has fluctuated at low numbers for many years, current evidence of increases over the last few years reflects continued reproduction and resiliency of this population. Therefore, we find that the Humboldt penguin is not currently in danger of extinction in the Peruvian portion of the range.

As a result, while the best available scientific and commercial data allow us to make a determination as to the rangewide status of the Humboldt penguin, we have determined that there are no significant portions of the range in which the species is currently in danger of extinction. Therefore, we are listing the Humboldt penguin as a threatened species throughout its range under the Act.

Erect-Crested Penguin (*Eudyptes sclateri*)

Background

The erect-crested penguin, a New Zealand endemic, breeds on the Bounty Islands and Antipodes Islands, located approximately 437 mi (700 km) and 543 mi (870 km), respectively, southeast of the South Island of New Zealand (NZ DOC 2006, pp. 27, 30). Its habitat consists of 8 of the 20 Bounty islands, with a total area of 0.5 mi^2 (1.3 km^2). The Antipodes Islands consist of two main islands and some minor islands. The largest is Antipodes Island, consisting of 2,025 hectares (ha) (5,004 acres (ac)), and the second island, Bollons, consists of 50 ha (124 ac). Erect-crested penguins nest in large, dense, conspicuous colonies, numbering thousands of pairs, on rocky terrain (BirdLife International 2007, p. 3). Winter distribution at sea is largely unknown.

The Action Plan for Seabird Conservation of New Zealand lists the total world breeding population of erect-crested penguin at 81,000 pairs +/- 4,000 pairs (Taylor 2000, p. 65). In 1978, counts of erect-crested penguins at Bounty Islands estimated 115,000 breeding pairs (Robertson and van Tets 1982, p. 315), but these counts are considered overestimations (Houston 2007, p. 3). While the data were not directly comparable, 1997 counts found 27,956 pairs (Taylor 2000, p. 65), suggesting that a large decline in numbers may have occurred at the Bounty Islands (BirdLife International 2007, p. 2). There have been no complete surveys of the species since 1997–1998; however, a 2004 survey found numbers on Proclamation Island (2,788 breeding pairs) (De Roy and Amey 2005) to be similar to the numbers found in 1998, suggesting a stable population, at least at that breeding site.

In 1978, the population on the Antipodes was thought to be similar in size to that of the Bounty Islands (about 115,000 breeding pairs). Surveys in 1995 indicated a population of 49,000 to 57,000 pairs in the Antipodes (Taylor 2000, p. 65). Tennyson (2002) estimated a population of 52,000 pairs in 1995. Comparisons of photographs of nesting areas from the Antipodes show a constriction of colonies at some sites during the period 1978–1995. There have been no subsequent formal counts of erect-crested penguins at either the Bounty Islands or the Antipodes, and visits to the islands are rare. Both observations and photographs taken by researchers visiting these islands for other purposes have provided anecdotal information that erect-crested penguin colony sizes continue to decrease (Davis 2001, p. 8; Houston 2008, pers. comm.).

A few hundred birds formerly bred at Campbell Island farther to the southwest in the 1940s (Bailey and Sorensen 1962); in 1986–1987, a small number of birds (20 to 30 pairs) were observed there, but no breeding was seen (Taylor 2000, p. 65). Breeding on the Auckland Islands, also to the southwest, was considered a possibility, with one pair found breeding there in 1976 (Taylor 2000, p. 65). The most recent penguin conservation assessment (Ellis *et al.* 2007, p. 6) reported erect-crested penguins are no longer present at Campbell or Auckland Islands. There is one record of breeding on the mainland of the South Island of New Zealand at Otago Peninsula, but it is unlikely there was ever widespread breeding there (Richdale 1950, pp. 152-166; Houston 2007, p. 3). Based on this information, we do not consider these areas to be part of the erect-crested penguin's current range, and have not included them in our analysis of the status of this species.

On the basis of declines of at least 50 percent in the past 45 years and a breeding range constricted to two locations, the IUCN has listed the species as "Endangered" on the IUCN Red List (BirdLife International 2007, p. 1). It is ranked as Category B (second priority) on the Molloy and Davis threat categories used by the New Zealand DOC (Taylor 2000, p. 33). On that basis, it was placed in the second category of highest priority in the New Zealand Action Plan for Seabird Conservation (Taylor 2000, p. 33). The species is listed as "acutely threatened—nationally endangered" on the New Zealand Threat Classification System list (Hitchmough *et al.* 2007, p. 38; Molloy *et al.* 2002, pp. 13–23). Under this classification system, which is nonregulatory, species experts assess the placement of species into threat categories according to both status criteria and threat criteria.

Summary of Factors Affecting the Erect-Crested Penguin

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Erect-crested Penguin Habitat or Range

There is little evidence of destruction, modification, or curtailment of erect-crested penguin breeding habitat on land at the Bounty and Antipodes Islands. Feral animals such as sheep and cattle, which could trample nesting habitat, are absent. Competition for breeding habitat with fur seals is reported to be minimal (Houston 2007, p. 1).

The New Zealand sub-Antarctic islands have been inscribed on the World Heritage List (World Heritage List 2008, p. 16). All islands are protected as National Nature Reserves and are State-owned (World Heritage Committee Report 1998, p. 21). We find that the present or threatened destruction, modification, or curtailment of the terrestrial habitat or range of the erect-crested penguin is not a threat to the species.

Given the lack of terrestrial predators at the majority of erect-crested penguin colony sites, the absence of direct competition with other species, and the lack of physical habitat destruction at these sites, recent declines in erect-crested populations have been attributed to changes in the marine habitat. Penguins are susceptible to local ecosystem perturbations because they are constrained by how far they can swim from the terrestrial habitat in search of food (Davis 2001, p. 9). It has been hypothesized that slight warming of sea temperatures, which is attributed to El Niño events, coupled with change in distribution of prey species due to a change in the ocean environment, is having an impact on erect-crested penguin colonies (Taylor 2000, p. 66; Ellis *et al.* 2007, p. 6). With respect to modification of the marine habitat of this species, periodic El Niño events have been shown to have significant effects on the marine environment on which species such as the erect crested penguins depend. El Niño events are known to reduce the available food sources such as fish species on which penguins rely heavily. These El Niño events are considered to be the main marine perturbation for the erect-crested penguins. The primary basis for this inference comes from studies of a closely related species, the southern rockhopper penguin at Campbell Island (Cunningham and Moors 1994, p. 27), where the population declined by 94 percent between the early 1940s and 1985, from an estimated 800,000 breeding pairs to 51,500 (Cunningham and Moors 1994, p. 34). The majority of this decline appears to have coincided with a period of warmed sea surface temperatures between 1946 and 1956. It is widely inferred that warmer waters most likely affected southern rockhopper penguins through changes in the abundance, availability, and distribution of their food supply (Cunningham and Moors 1994, p. 34). Recent research suggests they may have had to work harder to find the same food (Thompson and Sagar 2002, p. 11).

The suggestion that erect-crested penguins may have been similarly impacted by changes in the marine habitat during this time period is strengthened by the fact that erect-crested penguin breeding colonies are now absent from Campbell Island (Ellis *et al.* 2007, p. 6); they disappeared from the island during the same time period (1940s to 1987) as the southern rockhopper's decline. In the 1940s, a few hundred erect-crested penguins bred on the island (Taylor 2000, p. 65). The latest IUCN assessment of the erect-crested penguin found that oceanic warming is a continuing threat, resulting in a "very rapid decline" in more than 90 percent of the population, and thus is a threat of high impact to this species (BirdLife International 2007, p. 2 of "additional data"). Therefore, based on the best available information, we find that the present or threatened destruction, modification, or curtailment of the erect-crested penguin's marine habitat is a threat to the species.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Aside from periodic surveys and the possibility of a future research program focused on the diet and foraging of the species, we are unaware of any purpose for which the erect-crested penguin is currently being utilized. Therefore, we conclude that overutilization for commercial, recreational, scientific, or educational purposes is not a threat to this species.

Factor C. Disease or Predation

Avian disease has not been recorded in erect-crested penguins, although disease vectors of ticks and bird fleas are found in colonies (Taylor 2000, p. 66).

The only known mammalian predators within the current range of the erect-crested penguin are mice, which are present only on the main Antipodes Island. Although their eradication from this island is recommended as a future management action in the Action Plan for Seabird Conservation in New Zealand, we have found no reference to these mice impacting the erect-crested penguins on this one island in their range (Taylor 2000, p. 67). At the other islands in the Antipodes group (Bollons, Archway, and Disappointment) and at the Bounty Islands, mammalian predators are not present. Feral cats, sheep, and cattle are also no longer present (Taylor 2000, p. 66). The threat of future introduction of invasive species is being managed by the New Zealand DOC, which has measures in place for quarantine of researchers working on sub-Antarctic islands (West 2005, p. 36). These quarantine measures are an important step toward controlling the introduction of invasive species. At this time, however, we have no means to measure their effectiveness.

On the basis of this information, we find that neither disease nor predation is a threat to the erect-crested penguin.

Factor D. Inadequacy of Existing Regulatory Mechanisms

All breeding islands of the erect-crested penguin are protected by New Zealand as National Nature Reserves. The marine areas are managed under fisheries legislation (World Heritage Committee Report 1998, p. 21).

The Action Plan for Seabird Conservation in New Zealand is in place and outlines previous conservation actions, future management actions needed, future survey and monitoring needs, and research priorities. Among the most relevant recommendations are pest quarantine measures to keep new animal and plant pest species from reaching offshore islands and eradication of mice from the main Antipodes Island (Taylor 2000, p. 67). At least one of these recommendations has been put into place; as mentioned under Factor C, strict required quarantine measures are now in place for researchers and expeditions to all New Zealand sub-Antarctic islands to prevent the introduction or re-introduction of animal and plant pest species (West 2005, p. 36). At this time, we have no means to measure the effectiveness of these quarantine measures.

In addition to national protection, all of New Zealand sub-Antarctic islands are inscribed on the World Heritage List (World Heritage List 2008, p. 16). World Heritage designation places an obligation on New Zealand to "take appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage" (World Heritage Convention 1972, p. 3). At the time of inscription of this site onto the World Heritage List in 1998, human impacts were described as "limited to the effects of introduced species at Auckland and Campbell Islands" (World Heritage Convention Nomination Documentation 1998, p. 1).

New Zealand has in place the New Zealand Marine Oil Spill Response Strategy, which provides the overall framework to mount a response to marine oil spills that occur within New Zealand's area of responsibility. The aim of the strategy is to minimize the effects of oil on the environment and human safety and health. The National Oil Spill Contingency Plan promotes a planned and nationally coordinated response to any marine oil spill that is beyond the capability of a local regional council or outside the region of any local council (Maritime New Zealand 2007, p. 1). As discussed below under Factor E, rapid containment of spills in remote areas and effective triage response under this plan have shown these to be effective regulatory mechanisms (New Zealand Wildlife Health Center 2007, p. 2; Taylor 2000, p. 94).

On the basis of national and international protections in place, we find that inadequacy of existing regulatory mechanisms is not a threat to the erect-crested penguin.

Factor E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species

New Zealand's Action Plan for Conservation of Seabirds notes that, while there is a possibility that erect-crested penguins could be caught in trawl nets or by other fishing activity, there are no records of such (Taylor 2000, p. 66). The IUCN noted that the New Zealand DOC has limited legal powers to control commercial harvesting in waters around the sub-Antarctic islands and recommended that the New Zealand Ministry of Fisheries should be encouraged to address fisheries bycatch and squid fishery impacts (World Heritage Nomination—IUCN Technical Evaluation 1998, p. 25). As noted in the discussion under Factor A, the Action Plan for Conservation of New Zealand Seabirds outlines research efforts that would provide more data on the diet and activities and distribution of erect-crested penguins at sea. Such research will assist in evaluating whether competition for prey with fisheries or bycatch from fisheries' activities is a factor in declines of the erect-crested penguin. However, in the absence of such research results, we have found no evidence that erect-crested penguins are subject to fisheries bycatch.

We have examined the possibility that oil and chemical spills may impact erect-crested penguins. Such spills, should they occur and not be effectively managed, can have direct effects on marine seabirds. A large proportion of erect-crested penguin populations are found on two isolated, but widely separated, island archipelagos during the breeding season. While the 138-mi (221-km) distance between the two primary breeding areas reduces the likelihood of impacts affecting the entire population, the limited number of breeding areas is a concern relative to the potential of oil spills or other catastrophic events. As a gregarious, colonial nesting species, erect-crested penguins are potentially susceptible to mortality from local oil spill events during the breeding season. A significant spill at either the Antipodes or Bounty Islands could jeopardize more than one-third of the population of this species. The nonbreeding season distribution of erect-crested penguins is not well-documented, but there is the potential for birds to encounter spills within the immediate region of colonies or, if they disperse more widely, elsewhere in the marine environment.

Based on previous incidents of oil and chemical spills around New Zealand, we might have concluded that this is a threat to this species, were it not for New Zealand's successful Oil Spill Response and Contingency Plan. For example, in March 2000, the fishing vessel *Seafresh 1*sank in Hanson Bay on the east coast of Chatham Island and released 66 T (60 t) of diesel fuel. Rapid containment of the oil at this very remote location prevented any wildlife casualties (New Zealand Wildlife Health Center 2007, p. 2). The same source reported that, in 1998, the fishing vessel *Don Wong 529*ran aground at Breaksea Islets, off Stewart Island, outside the range of the erect-crested penguin. Approximately 331 T (300 t) of marine diesel was spilled along with smaller amounts of lubricating and waste oils. With favorable weather conditions and establishment of triage response, no casualties from this pollution event were discovered (Taylor 2000, p. 94). The potential threat of oil or chemical spills to the erect-crested penguin is mitigated by New Zealand's oil spill response and contingency plans, which have been shown to be effective in previous events even at remote locations. The remoteness of Antipodes and Bounty Islands and their extreme distance from major shipping routes or shipping activity further lessen the chance that oil and chemical spills would affect this species. On the basis of the best available information, we find that oil and chemical spills are not a threat to the erect-crested penguin.

Erect-crested Penguin Finding

Significant declines in numbers have been documented for the erect-crested penguin between 1978 and 1997 at their two primary breeding grounds on the Bounty and Antipodes Islands. The latest population estimates from the late 1990s indicated there were approximately 81,000 pairs of erect-crested penguins in these two primary breeding grounds. The declines are reported to be largest at Bounty Island, although the extent of the decline is uncertain due to the differing methodologies between the surveys conducted there in 1978 and those conducted in 1997–1998. At the Antipodes Islands, declines of 50 to 58 percent have been estimated between 1978 and 1995, with photographic evidence from those 2 years showing obvious contraction in colony areas at some sites (Taylor 2000, p. 65). Formal surveys have not been conducted since the 1995 and 1997–1998 surveys referenced above for the Antipodes and Bounty Islands, respectively. The only further information for this primary portion of the range is qualitative photographic evidence and observations suggesting that declines continue.

The most recent detailed information, from a decade ago, indicated populations were in decline, with more recent qualitative information suggesting declines continue. We have no recent population assessments for the erect-crested penguin. Although this qualitative data is currently the best information available, its use in establishing a reliable population trend is limited. Despite the relatively high population numbers of this species estimated in 1998, the population numbers at the time showed a very high rate of decline.

The weight of evidence of available information suggests that the changes in the marine environment due to El Niño events may be the most likely cause of this species' decline. This species' breeding colonies have been reduced to only two breeding island groups, separated from one another by 138 mi (221 km). Lower population numbers, combined with the limited number of breeding areas, make this species even more vulnerable to the threats from changes in the marine habitat. El Niño events can have an effect on the marine environment by causing changes in ocean currents. Warmer waters will not contain the fish species normally preyed upon by penguins. Ocean areas used by penguins to forage for fish species may be warmer during El Niño years, which decreases food availability for the penguins. Because the normal prey base is unavailable for the erect crested penguins, they have to travel farther and expend more energy to obtain food.

We are unsure the exact mechanism causing the decline of the erect-crested penguin populations, however data indicate that the population is in a declining trend. Although changes in the marine environment (Factor A) have been hypothesized to be responsible for the species' decline, the cause of the decline are not definitively known. It is not necessary to identify the causes of the decline with certainty to warrant listing of a species under the Act. At this time, NZDOW can monitor any threats to the species, but they currently have no management tools to reduce any suspected threats. Therefore, it is reasonably likely that these threats will continue in the future. We have no reason to believe that population trends will change in the future, nor that the effects of current threats acting on the species will be ameliorated in the foreseeable future. Therefore, on the basis of our analysis of the best available scientific and commercial information, we conclude that, due to changes in the marine environment, the erect-crested is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Significant Portion of the Range Analysis

Erect-crested penguins breed on two primary island groups, Bounty and Antipodes Islands, which lie about 138 mi (221 km) from one another in the South Pacific Ocean to the southwest of the South Island of New Zealand. The erect-crested penguin is documented as in decline at these two islands. Our rangewide threats analysis found that changes in the marine habitat—slight warming of sea surface temperatures and their possible impact on prey availability—have the same impact on the two areas. No information is available that suggests this threat is disproportionate between these two areas. The overall population number of the erect-crested penguins is not low—27,956 pairs at Bounty Island and 49,000 to 57,000 pairs at the Antipodes Islands. Although the population numbers have declined at a very high rate and appear to be continuing to decline, the most recent population estimates indicate that the populations of both island groups are not currently in danger of extinction.

As a result, while the best scientific and commercial data allow us to make a determination as to the rangewide status of the erect-crested penguin, we have determined that there are no significant portions of the range in which the species is currently in danger of extinction. Because we find that the erect-crested penguin is not currently in danger of extinction in these two portions of its range, we need not address the question of significance for these populations.

Therefore, we are listing the erect-crested penguin as a threatened species throughout all of its range under the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and encourages and results in conservation actions by Federal governments, private agencies and groups, and individuals.

Section 7(a) of the Act, as amended, and as implemented by regulations at 50 CFR part 402, requires Federal agencies to evaluate their actions within the United States or on the high seas with respect to any species that is proposed or listed as endangered or threatened, and with respect to its critical habitat, if any is being designated. However, given that the yellow-eyed penguin, white-flippered penguin, Fiordland crested penguin, Humboldt penguin, and erect-crested penguin are not native to the United States, critical habitat is not being designated for these species under section 4 of the Act.

Section 8(a) of the Act authorizes financial assistance for the development and management of programs that the Secretary of the Interior determines to be necessary or useful for the conservation of endangered and threatened species in foreign countries. Sections 8(b) and 8(c) of the Act authorize the Secretary to encourage conservation programs for foreign endangered species and to provide assistance for such programs in the form of personnel and the training of personnel.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered and threatened wildlife. As such, these prohibitions would be applicable to yellow-eyed penguin, white-flippered penguin, Fiordland crested penguin, Humboldt penguin, and erect-crested penguin. Regulations governing permits are codified at 50 CFR 17.22 for endangered species, and at 17.32 for threatened species. The prohibitions for threatened species state that most of the prohibitions for endangered species also apply to threatened species. The prohibitions under 50 CFR 17.21 make it illegal for any person subject to the jurisdiction of the United States to "take" (take includes to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt any of these) within the United States or upon the high seas, import or export, deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of a commercial activity, or to sell or offer for sale in interstate or foreign commerce, any endangered wildlife species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken in violation of the Act.

We may issue permits to carry out otherwise prohibited activities involving endangered and threatened wildlife species under certain circumstances. A permit must be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities.

Required Determinations

National Environmental Policy Act (NEPA)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), need not be prepared in connection with regulations adopted under section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited in this rule is available on the Internet at *http://www.regulations.gov or upon request from the Endangered Species Program, U.S. Fish* and Wildlife Service (see the **FOR FURTHER INFORMATION CONTACT** section).

Authors

The primary authors of this final rule are the staff members of the Branch of Foreign Species, Endangered Species Program, U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Arlington, VA 22203.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

■ Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

■ 2. Amend § 17.11(h) by adding new entries for "Penguin, erect-crested," "Penguin, Fiordland Crested," "Penguin, Humboldt," "Penguin, white-flippered," and "Penguin, yellow-eyed" in alphabetical order under BIRDS to the List of Endangered and Threatened Wildlife as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*	*	
BIRDS							

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*	*	
Penguin, erect-crested	*Eudyptes sclateri*	New Zealand, Bounty Islands and Antipodes Islands	Entire	T	771	NA	NA
Penguin, Fiordland crested	*Eudyptes pachyrhynchus*	New Zealand, South Island and offshore islands	Entire	T	771	NA	NA
*	*	*	*	*	*	*	
Penguin, Humboldt	*Spheniscus humboldti*	Eastern Pacific Ocean—Chile, Peru	Entire	T	771	NA	NA
Penguin, white-flippered	*Eudyptula minor albosignata*	New Zealand, South Island	Entire	T	771	NA	NA
Penguin, yellow-eyed	*Megadyptes antipodes*	New Zealand, South Island and offshore islands	Entire	T	771	NA	NA
*	*	*	*	*	*	*	

* * * * *

Dated: July 12, 2010

Wendi Weber,

Acting Director, U.S. Fish and Wildlife Service.

[FR Doc. 2010–18884 Filed 8–2–10; 8:45 am]

BILLING CODE 4310–55–S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 218

[Docket No. 0907281180–0269–02]

RIN 0648–AX90

Taking and Importing Marine Mammals; Military Training Activities and Research, Development, Testing and Evaluation Conducted Within the Mariana Islands Range Complex

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

ACTION: Final rule.

SUMMARY: NMFS, upon application from the U.S. Navy (Navy) on behalf of the Department of Defense (including the Navy, the U.S. Air Force (USAF), and the U.S. Marine Corps (USMC)), is issuing regulations to govern the unintentional taking of marine mammals incidental to activities conducted in the Mariana Islands Range Complex (MIRC) study area for the period of July 2010 through July 2015. The Navy's activities are considered military readiness activities pursuant to the Marine Mammal Protection Act (MMPA), as amended by the National Defense Authorization Act for Fiscal Year 2004 (NDAA). These regulations, which allow for the issuance of "Letters of Authorization" (LOAs) for the incidental take of marine mammals during the described activities and specified timeframes, prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, as well as requirements pertaining to the monitoring and reporting of such taking.

DATES: Effective August 3, 2010 through August 3, 2015.

ADDRESSES: A copy of the Navy's application (which contains a list of the references used in this document), NMFS' Record of Decision (ROD), and other documents cited herein may be obtained by writing to Michael Payne, Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225 or by telephone via the contact listed here (*see* **FOR FURTHER INFORMATION CONTACT**).

FOR FURTHER INFORMATION CONTACT: Jolie Harrison, Office of Protected Resources, NMFS, (301) 713–2289, ext. 166.

SUPPLEMENTARY INFORMATION:

Availability of Supporting Information

Extensive Supplementary Information was provided in the proposed rule for this activity, which was published in the **Federal Register** on October 20, 2009 (74 FR 53796). This information will not be reprinted here in its entirety; rather, all sections from the proposed rule will be represented herein and will contain either a summary of the material presented in the proposed rule or a note referencing the page(s) in the proposed rule where the information may be found. Any information that has changed since the proposed rule was published will be addressed herein. Additionally, this final rule responds to the comments received during the public comment period.

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (Secretary) to allow, upon request, the incidental, but not intentional taking of marine