United States Department of the Interior

FISH AND WILDLIFE SERVICE
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TAKE PRIDE IN AMERICA

In Reply Refer To:
1-2-1999-F-02.2

OCT - 8 2004

William L. Robinson, Regional Administrator
Pacific Islands Regional Office
National Marine Fisheries Service
1601 Kapiolani Boulevard, #1110
Honolulu, Hawaii 96814-2937

Subject: U.S. Fish and Wildlife Service Biological Opinion under section 7 of the Endangered Species Act on the effects of the reopened shallow-set sector of the Hawaii-based longline fishery on the short-tailed albatross (*Phoebastria albatrus*), formal consultation log number 1-2-1999-F-02.2 (supplementing 1-2-1999-F-02R)

Dear Mr. Robinson:

Enclosed please find the biological opinion of the U.S. Fish and Wildlife Service (Service) on the effects of the reopened shallow-set sector of the Hawaii-based longline fishery on the endangered short-tailed albatross (*Phoebastria albatrus*), Service consultation log number 1-2-1999-F-02.2. This biological opinion examines only the effects of the reopened shallow-set sector of the fishery on the short-tailed albatross. Therefore, our Biological Opinion issued on November 18, 2002 (November 2002 Opinion; log number 1-2-1999-F-02R) on the deep-set sector of the fishery <u>remains in effect</u> and is supplemented by the enclosed biological opinion.

Consultation on the effects of Hawaii-based longline operations on the short-tailed albatross was triggered originally (in 1999) by the record of take of this species in Alaska longline fisheries, the presence of a small number of short-tailed albatrosses in the Northwestern Hawaiian Islands, and the observed mortality of two other, similar species, the black-footed (*P. nigripes*) and Laysan (*P. immutabilis*) albatrosses, resulting from Hawaii-based pelagic longline fishing. We issued our original biological opinion on November 28, 2000 (log number 1-2-1999-F-02). Consultation was reinitiated in 2001 because of the court-ordered suspension of shallow-set, or swordfish-target, longlining in Hawaii-based fishery. The resulting biological opinion, which we issued to the National Marine Fisheries Service (NOAA Fisheries) on November 18, 2002, (November 2002 Opinion; Log Number 1-2-1999-F-02R) examined the effects of a deep-set, or tuna-target, fishery on the short-tailed albatross, because this was the only type of longline fishing permitted for Hawaii-based vessels.

The current consultation was triggered by the proposed reopening of shallow-set fishing in the Hawaii-based longline fishery. Prior to its cessation in 2001, shallow-set longline fishing was documented to account for the majority of seabird mortality in the Hawaii-based longline fishery. The reopening of this sector of the fishery therefore was sufficient to trigger new consultation under section 7 of the Endangered Species Act because it constitutes a modification to the fishery causing effects to the short-tailed albatross not considered in the November 2002 Opinion.

We appreciate the ongoing collaboration of NOAA Fisheries with us on the completion of this consultation. We look forward to learning about the current voluntary implementation of side setting in the Hawaii-based longline fishery and reviewing observer data from these vessels. If you have any questions, please contact Fish and Wildlife Biologist Holly Freifeld by telephone at (808) 792-9400.

Sincerely,

Gina Shultz

for Jeff M. Newman
Acting Field Supervisor

Attachments:
Biological Opinion
Literature and references cited
Appendices

U.S. FISH AND WILDLIFE SERVICE
BIOLOGICAL OPINION ON THE EFFECTS OF THE REOPENED SHALLOW-SET SECTOR OF THE HAWAII-BASED LONGLINE FISHERY ON THE SHORT-TAILED ALBATROSS (*Phoebastria albatrus*)

Formal Consultation Log Number 1-2-1999-F-02.2

October 8, 2004

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CONSULTATION HISTORY

Please see the November 2000 Opinion and the November 2002 revised Opinion for the history of previous consultations.

August 31, 2003: The Washington, D.C. District Court issued a ruling that vacated National Marine Fisheries Service's (NOAA Fisheries) June 12, 2002, rule, effectively invalidating the prohibition on targeting swordfish in the Hawaii-based longline fishery. Because the November 18, 2002 revised biological opinion for the short-tailed albatross examined the effects of a tuna-only fishery, NOAA Fisheries now was vulnerable, *i.e.*, not legally permitted, for take of short-tailed albatrosses by vessels targeting swordfish.

October 6, 2003: In response to several requests for stays of the August 31 ruling to provide NOAA Fisheries time to put new regulations in place to protect sea turtles, the court granted a stay and reinstated the existing regulations until April 1, 2004.

November 19, 2003: NOAA Fisheries and U.S. Fish and Wildlife Service (Service) biologists met to discuss upcoming changes to the Hawaii-based longline fishery and a reinitiated consultation on the effects of these changes on the short-tailed albatross. Participants included: Service – Holly Freifeld, NOAA Fisheries – Alvin Katekaru and Karla Gore.

January 23, 2004: In an email, NOAA Fisheries transmitted to the Service a draft letter requesting reinitiation of consultation under section 7 of the Endangered Species Act (Act) on the short-tailed albatross (Karla Gore, pers. comm., 2004). The Service responded that day with comments on the draft letter (Holly Freifeld, pers. comm., 2004).

January 28, 2004: NOAA Fisheries published a proposed rule in the *Federal Register* to implement regulatory amendments to the Fisheries Management Plan for the Pelagic Fisheries of the Western Pacific Region (Pelagics FMP). These amendments included reopening shallow-set sector of fishery under a new set of management conditions intended to reduce the incidental take of sea turtles.

February 23, 2004: NOAA Fisheries issued a biological opinion on the proposed amendments to the Pelagics FMP. This biological opinion examined the effects of the amendments on sea turtles.

March 3, 2004: The Service received a letter from NOAA Fisheries dated February 27, 2004, requesting reinitiation of section 7 consultation on the short-tailed albatross (Sam Pooley, *in litt.*, 2004).

March 11, 2004: Service and NOAA Fisheries staff met to discuss the upcoming consultation, and to discuss additional information needed to reinitiate consultation, including clarification of the status of the Hawaii Longline Association (HLA) as a possible applicant in the consultation.

Participants included: Service – Holly Freifeld, NOAA Fisheries – Alvin Katekaru and Karla Gore.

March 12, 2004: The Service received a letter addressed to NOAA Fisheries and the Service from HLA's legal counsel, Stoel Rives, which notified the agencies that HLA was entitled to applicant status under a Federal district court ruling that found in favor of HLA on this issue. The letter also requested that the Western Pacific Regional Fisheries Management Council (WPRFMC) be included in consultation as well, and informed the agencies that HLA and WPRFMC were preparing a biological assessment of the effects of the Hawaii-based longline fishery on the short-tailed albatross (Jeff Leppo, *in litt.*, 2004).

March 19, 2004: In a letter, the Service requested clarification from NOAA Fisheries on several points in their February 27, 2004 reinitiation letter. This clarification was needed before the Service could reinitiate consultation (Gina Shultz, *in litt.*, 2004).

March 24, 2004: In a telephone conversation, NOAA Fisheries staff confirmed that HLA would be their applicant in this consultation (Alvin Katekaru, pers. comm., 2004).

March 25, 2004: The Service received a copy of a letter from NOAA Fisheries to Stoel Rives confirming HLA's status as an applicant in this consultation and welcoming the informal participation of WPRFMC staff, although WPRFMC would not be an applicant (Sam Pooley, *in litt.*, 2004).

March 26, 2004: In an email, the Service provided comments on NOAA Fisheries' draft response to our March 19 letter (Holly Freifeld, pers. comm., 2004).

March 26, 2004: Service, NOAA Fisheries, HLA, and WPRFMC staff met to discuss a tentative schedule for consultation, the role of HLA as an applicant, and the participation of WPRFMC. Participants included: Service – Gina Shultz, Marilet Zablan, Holly Freifeld; NOAA Fisheries – Alvin Katekaru, Karla Gore; HLA – Jim Cook and Sean Martin; WPRFMC – Marcia Hamilton and Irene Kinan.

March 29, 2004: In a letter, NOAA Fisheries responded to the Service's March 19 letter. This letter provided (1) official verification of HLA's applicant status, (2) NOAA Fisheries' assessment of how the proposed action may adversely affect (take) the short-tailed albatross, and (3) information regarding the biological assessment in preparation by WPRFMC on behalf of HLA (Sam Pooley, *in litt.*, 2004).

April 2, 2004: NOAA Fisheries published a final rule in the *Federal Register* codifying some of the Terms and Conditions of their February 23, 2004 Biological Opinion addressing the effects of the fishery on sea turtles (69 FR 17329).

April 2, 2004: In a letter, the Service acknowledged receipt of NOAA Fisheries' March 29, 2004, letter, and confirmed reinitiation of consultation as of March 3, 2004 (R. Mark Sattelberg, *in litt.*, 2004).

April 15, 2004: In an email, the Service transmitted to NOAA Fisheries a draft of the description of the proposed action (Holly Freifeld, pers. comm., 2004).

April 19, 2004: In a letter, the WPRFMC informed the Service of the regulatory amendment process underway to incorporate seabird deterrents into the Pelagics FMP and requested comments from the Service on the five seabird deterrent alternatives WPRFMC was considering (Kitty Simonds, *in litt.*, 2004).

April 28, 2004: NOAA Fisheries convened a teleconference with Service, HLA, and WPRFMC staff to provide an update on consultation progress. Participants included Service – Holly Freifeld; NOAA Fisheries – Karla Gore and Alvin Katekaru; HLA (Stoel Rives) – Jim Lynch and Jeff Leppo; WPRFMC – Marcia Hamilton and Irene Kinan.

May 5, 2004: In a written response to the April 19 letter from WPRFMC, the Service transmitted comments on the draft list of seabird deterrents (R. Mark Sattelberg, *in litt.*, 2004).

May 5, 2004: In an email, NOAA Fisheries transmitted comments on the draft description of the proposed action. These comments did not include HLA comments (Karla Gore, pers. comm., 2004).

May 18, 2004: A conference call was held among Service, NOAA Fisheries, HLA, and WPRFMC staff to discuss the calculation of incidental take and potential terms and conditions for the new biological opinion. Participants included Service – Holly Freifeld; NOAA Fisheries – Karla Gore, Alvin Katekaru; HLA – Jim Cook, Sean Martin; Stoel Rives – Jeff Leppo, Jim Lynch; WPRFMC – Marcia Hamilton.

May 20, 2004: NOAA Fisheries transmitted to the Service a Biological Assessment of the Pelagics New Technologies Regulatory Amendment, prepared by HLA and WPRFMC. This document was submitted as "a source for background information to the ongoing short-tailed albatross consultation" (Sam Pooley, *in litt.*, 2004).

June 1, 2004: In an email, the Service requested clarification from NOAA Fisheries about whether their proposed action included the entire fishery or only the reopened swordfish fishery (Holly Freifeld, pers. comm., 2004).

June 3, 2004: A meeting was held among Service, NOAA Fisheries, HLA, and WPRFMC staff to discuss the timing of the WPRFMC and NOAA Fisheries regulatory amendment process and whether the consultation should consider the entire fishery or only the reopened swordfish fishery. Participants included Service – Holly Freifeld; NOAA Fisheries – Karla Gore, Alvin Katekaru; HLA (Stoel Rives) –Jim Lynch; WPRFMC – Marcia Hamilton, Irene Kinan.

June 16, 2004: In an email, the Service transmitted to NOAA Fisheries a revised draft of the description of the proposed action with requests for addition information (Holly Freifeld, pers. comm., 2004).

June 21, 2004: In a letter, NOAA Fisheries clarified that their proposed action under section 7 consultation was only the reopened swordfish fishery. The letter described the change to the tuna fishery, the opening of the Seasonal Area Closure, as not constituting a change to that fishery sufficient to warrant reinitiating consultation and revising the November 2002 Opinion (William Robinson, *in litt.*, 2004).

June 25, 2004: In an email, the Service transmitted to NOAA Fisheries a draft of the Effects of the Action section of the biological opinion for review (Holly Freifeld, pers. comm., 2004).

June 29, 2004: In an email, NOAA Fisheries provided the Service with their final comments and information on the description of the proposed action (Karla Gore, pers. comm., 2004).

July 1, 2004: In an email, NOAA Fisheries provided their comments on the draft of the Effects of the Action section. No HLA comments were included (Karla Gore, pers. comm., 2004).

July 1, 2004: In an email, the Service transmitted to NOAA Fisheries a draft of the conservation recommendations for the biological opinion (Holly Freifeld, pers. comm., 2004).

July 2, 2004: In an email, the Service transmitted to NOAA Fisheries a draft of the consultation history for the biological opinion (Holly Freifeld, pers. comm., 2004).

July 7, 2004: In an email, the Service transmitted to NOAA Fisheries a draft of the conclusion of the biological opinion, including the Incidental Take Statement, Reasonable and Prudent Measures, and Terms and Conditions for minimizing the incidental take of the short-tailed albatross (Holly Freifeld, pers. comm., 2004).

July 8, 2004: In an email, the Service transmitted to NOAA Fisheries a draft of the Status of the Species section of the biological opinion (Holly Freifeld, pers. comm., 2004).

July 8, 2004: In a telephone conversation, NOAA Fisheries transmitted some preliminary comments from HLA on the draft Effects of the Action section of the biological opinion (Karla Gore, pers. comm., 2004).

July 9, 2004: In an email, the Service transmitted to NOAA Fisheries a draft of the Environmental Baseline section of the biological opinion. We also alerted NOAA Fisheries of the likely need for an extension of the deadline for issuance of the biological opinion to address HLA's comments on the draft sections, as HLA's comments had not yet been received (Holly Freifeld, pers. comm., 2004).

July 9, 2004: In a telephone conversation, NOAA Fisheries indicated that they and HLA recognized the likely need for an extension of the deadline for issuance of the final biological opinion. NOAA Fisheries also indicated that they hope to receive complete written comments from HLA on the draft sections of the biological opinion by July 12 (Karla Gore, pers. comm., 2004).

July 12, 2004: In an email, NOAA Fisheries transmitted their and HLA's comments on the proposed action description for the biological opinion (Karla Gore, pers. comm. 2004).

July 13, 2004: In a telephone conference, Service, NOAA Fisheries, HLA and WPRFMC staff met to discuss comments on the draft sections of the biological opinion. Because of the nature of some of the comments and the Service's internal schedule for review of the final draft biological opinion, all parties agreed to an extension for issuance of the final biological opinion. Participants included Service – Holly Freifeld; NOAA Fisheries – Karla Gore, Alvin Katekaru; HLA (Stoel Rives) – Jim Lynch; WPRFMC – Marcia Hamilton.

July 16, 2004: In several emails, NOAA Fisheries transmitted their and HLA's comments on the draft Effects of the Action section of the biological opinion, and forwarded comments on the draft incidental take calculation from Chris Boggs, of NOAA Fisheries' Pacific Islands Fisheries Science Center (Karla Gore, pers. comm., 2004).

July 16, 2004: In an email, NOAA Fisheries advised the Service that they had not yet received complete comments from HLA on draft sections of the biological opinion, and indicated that they agreed to an extension of the original due date (July 16) for issuance of the biological opinion (Karla Gore, pers. comm., 2004).

August 12, 2004: In an email, NOAA Fisheries transmitted their and HLA's comments on the draft incidental take statement, reasonable and prudent measures, and terms and conditions of the biological opinion (Karla Gore, pers. comm., 2004). In a telephone discussion later that day, NOAA Fisheries indicated that they and HLA had submitted comments on all draft sections of the biological opinion on which they wished to comment (Karla Gore, pers. comm., 2004).

August 18, 2004: In an email, the Service transmitted a revised draft of the calculation of incidental take (Holly Freifeld, pers. comm., 2004).

August 19, 2004: In a telephone conference, the Service, NOAA Fisheries, HLA, and WPRFMC discussed comments submitted on draft sections of the biological opinion and a target period for issuance of the final biological opinion. NOAA Fisheries and HLA indicated that they wished to review revised drafts of the incidental take calculation, incidental take statement, reasonable and prudent measures, and terms and conditions once more prior to issuance of the biological opinion. Participants included Service – Holly Freifeld; NOAA Fisheries – Karla Gore, Alvin Katekaru; HLA (Stoel Rives) – Jim Lynch; WPRFMC – Marcia Hamilton.

September 3, 2004: In a letter, HLA legal counsel Stoel Rives agreed to an extension on the due date for issuance of the final biological opinion until October 8, 2004 (Jim Lynch, *in litt.*, 2004).

September 8, 2004: In a telephone conference, HLA expressed concern that the lawsuit filed against NOAA Fisheries by Earthjustice on August 30 would cause the delay of or have other ramifications for the completion of the present consultation with regard to the Migratory Bird Treaty Act. Participants included Service – Holly Freifeld, Marilet Zablan, Gina Shultz; NOAA Fisheries –Alvin Katekaru; HLA (Stoel Rives) – Jim Lynch. HLA later conveyed that they would provide a memo or letter regarding the separate lawsuit (Alvin Katekaru, pers. comm., 2004).

September 10, 2004: In an email, the Service transmitted to NOAA Fisheries final review drafts of the incidental take calculation, incidental take statement, reasonable and prudent measures, and terms and conditions (Holly Freifeld, pers. comm., 2004).

September 13, 2004: In an email, HLA and WPRFMC indicated that they had no comments on the final review drafts of the incidental take calculation, incidental take statement, reasonable and prudent measures, and terms and conditions, which had been forwarded to them by NOAA Fisheries (Jim Lynch, pers. comm., 2004).

September 14, 2004: In an email, Alvin Katekaru of NOAA Fisheries indicated that he had no comments on the final review drafts of the incidental take calculation, incidental take statement, reasonable and prudent measures, and terms and conditions, and that he had forwarded the drafts to other NOAA Fisheries reviewers in the Sustainable Fisheries and Observer Programs (Alvin Katekaru, pers. comm., 2004).

September 15, 2004: In an email, NOAA Fisheries transmitted their final comments on the final review drafts (Tom Graham, pers. comm., 2004).

BIOLOGICAL OPINION

I. Description of the Proposed Action

The following text describing the proposed action and management measures is taken from or based on text from NOAA Fisheries' Biological Opinion on Proposed Regulatory Amendments to the Fishery Management Plan for Pelagic Fisheries of the Western Pacific Region, issued on February 23, 2004 (NOAA Fisheries 2004a), the U.S. Fish and Wildlife Service's Biological Opinion for the Effects of the Hawaii-based Domestic Longline Fleet on the Short-tailed Albatross (*Phoebastria albatrus*), issued on November 28, 2000, consultation log number 1-2-1999-F-02 (USFWS 2000; November 2000 Opinion), the revision of that Opinion issued on November 18, 2002, consultation log number 1-2-1999-F-02R (USFWS 2002; November 2002

Opinion), and the biological assessment prepared by HLA and WPRFMC concerning the Proposed Regulatory Amendments to the Fishery Management Plan (HLA and WPRFMC 2004).

The proposed action is the reopening of the shallow-set, or swordfish-target, sector of the Hawaii-based longline fishery, which has been closed since 2001. This consultation addresses all shallow-set longline fishing vessel-related activities regulated by NOAA Fisheries in the area of the Pacific Ocean where Hawaii-based longline fishing vessels operate and target pelagic species with shallow-set gear configuration within the range of the short-tailed albatross. The short-tailed albatross is listed as endangered throughout its range, including the United States. Therefore, this consultation addresses Hawaii-based longline fishing activities that occur in the U.S. Exclusive Economic Zone (EEZ), which is from 3 to 200 nautical miles (5.6 to 370 km) from shore, and in international waters, which are beyond 200 nautical miles (370 km) from shore.

The deep-set, or tuna-target sector of this fishery was the subject of a section 7 consultation that concluded with the issuance of a revised biological opinion on November 18, 2002. That biological opinion remains in effect for that sector of the Hawaii-based longline fishery. The Southern Area closure is an area from 0º to 15º north latitude and 145º to 180º west longitude which has been closed each year from April 1 to May 31 since 2001 (69 FR 17329, April 2, 2004). This area closure primarily affected the tuna fishery as that sector of the fishery generally fishes to the south of the Hawaiian Islands. Based on the best available scientific and commercial fisheries information, NOAA Fisheries has determined that the impact of removing the Southern Area is minor, inasmuch as seabird deterrents required in the terms and conditions of the November 2002 Opinion to minimize incidental take of short-tailed albatross in the tuna-target fishery are only required north of 23º north latitude, eight degrees north of the Southern Area Closure. The use of these deterrents therefore is unaffected by this change. Moreover, the location and one-month duration of the closure were instituted for protection of sea turtles and had little or no effect on the interaction of the fishery with seabirds.

Hawaii-based longline vessels are categorized by length as small vessels (<56 feet [ft] or 18.7 meters [m]), medium vessels (56-74 ft [18.7-24.7 m]), and large vessels (74-94 ft [24.7-31.3 m]). The shallow-set component of the fishery is limited to a total of 2,120 sets each year by Hawaii-based vessels. The Hawaii-based longline fishery operates under a limited entry program with vessel permits issued by NOAA Fisheries upon consideration of applications which may be submitted by vessel owners at any time. Fishing trips historically have been defined as tuna trips, swordfish trips, or mixed trips, but now will be defined by NOAA Fisheries strictly as either tuna (deep-set) or swordfish (shallow-set) trips.

NOAA Fisheries is an agency within the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). NOAA Fisheries manages the pelagic fisheries of the western Pacific region in the EEZ off Hawaii, Guam, the Commonwealth of the Northern Mariana Islands, American Samoa, and various other U.S. possessions in the Pacific under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson Act). Under the Magnuson Act, WPRFMC is responsible for developing Fishery Management Plans

(FMPs) and Amendments. If approved by NOAA Fisheries, these FMPs are implemented by NOAA Fisheries through the Federal rule-making process.

Hawaii-based longline swordfish-target (shallow-set) gear configuration

Swordfish-target fishing differs from tuna-target fishing in that the gear is set at a shallower depth, usually between 98 and 295 ft (30 and 90 m). Shallow-set longline gear is generally set at night, with luminescent light sticks, thought to attract swordfish, attached to the branch lines or gangions. Four to six gangions are typically clipped to the mainline between floats. A typical set for swordfish uses about 700 to 1,000 hooks. The shallow-set fishery historically used large, J-style hooks or typical "fish-hook" shaped hooks, with a straight shank ending in a recurved, barbed hook, and squid bait. Under the proposed action larger, offset circle-shaped hooks with mackerel-type bait will be required for shallow sets. The proposed action allows 2,120 shallow sets each year by the Hawaii-based longline fleet. These 2,120 sets will be equally allocated among holders of Hawaii longline limited access permits.

During swordfish trips, fishers traditionally set their longline gear late in the afternoon to early evening, as swordfish are known to rise from deeper waters and feed near the surface at night. The proposed action requires that gear deployment take place entirely at night (see below). Historically, the deployment and soak occurs at night in about 90 percent of swordfish sets (He *et al.* 1997). Fishing vessels travel at about 9 nautical miles (17 km) per hour when setting the line. Gear deployment usually takes about 6 hours, depending upon the length of the main line. Gear will soak for 6 to 7 hours. Haulback operations begin in the early morning hours around dawn, and usually take from 8 to 10 hours to retrieve all of the gear and catch. Fishing vessels travel at about 4 to 5 nautical miles (7 to 9 km) per hour during haulback operations (J. Cook, pers. comm. 1999).

Vessel activity

The Hawaii-based longline fishery operates year-round although vessel activity increases during the fall and is greatest during the winter and spring months. This is the largest FMP-regulated commercial fishery in the western Pacific region. The number of active vessels in the Hawaii-based longline fishery increased in the late 1980s and peaked at 141 vessels in 1991. The number of vessels has since ranged from 101 to 125. The number of active vessels has decreased by about 25 since 2000, and in 2002, 100 Hawaii-based longline vessels were active, all targeting tuna. Part of the decrease can be attributed to Hawaii-based longline vessels relocating to California to fish for swordfish when that sector of the Hawaii-based fishery was closed by court order to protect federally threatened and endangered sea turtles. The vessels that relocated to California de-registered their Hawaii longline limited entry permits, enabling them to continue to legally fish for swordfish. Approximately 35 vessels fished out of California in 2001.

The proposed action may result in an increase in the number of active vessels registered in the fishery, especially since the closure of swordfish-target longlining in the west coast-based fishery resulting from final regulations (69 FR 11540, March 11, 2004) for U.S. West Coast Fisheries for Highly Migratory Species, but the likely number of new vessels is unknown. As of May 1, 2004, 120 vessels had requested shallow-set certificates, but this number does not indicate how many vessels will actually use the certificates to target swordfish. Potentially important influences on the number of swordfish vessels returning to Hawaii include the cost of relocating and the costs and risks associated with having to acquire a sufficient number of shallow-set certificates to enable full operations.

Number of trips

The annual number of trips for the Hawaii-based longline fishery has remained relatively stable, but there has been a gradual shift from mixed-target and swordfish-target trips to tuna-target trips since 1991 (Fig. 1, below). An abrupt shift to all tuna-target trips took place with the suspension of all shallow setting in 2001. In 2002, Hawaii-based longline vessels made 1,162 trips. This represents an increase of 128 trips from 2001. In 2002, all trips were categorized as tuna-target trips.

The proposed action would allow 2,120 shallow sets to be made each year, which is equivalent to approximately 166 trips given the historical average of 13 sets per swordfish trip. This number of shallow sets represents approximately 50% of historical swordfish effort combined with the shallow-set component of historical mixed-target effort (D. Kobayashi, NOAA Fisheries, pers. comm. 2004).

Number of hooks set

The Hawaii-based longline fishery set a record number of hooks in 2002: 27 million (NOAA Fisheries unpublished data, cited in NOAA Fisheries 2004a; Table 1). This increase in number of hooks is a result of the shift in effort to tuna, which typically includes more than twice as many hooks per day fished than swordfish- or mixed-target trips.

Table 1. Number of hooks set* by the Hawaii-based longline fishing fleet, 1991-2001. Sources: Ito and Machado, 1999; T. Swenarton, pers. comm., 2004.

Trip Type				
Year	Total	Swordfish	Tuna	Mixed
1991	11,914,608	2,243,375	5,124,277	4,546,956
1992	10,946,721	2,515,909	5,072,525	3,358,287
1993	12,137,533	3,207,976	6,359,162	2,570,395
1994	11,319,023	3,079.634	6,842,517	1,296,872
1995	14,155,169	1,464,589	10,186,299	2,504,281
1996	14,141,256	913,292	10,195,560	3,032,404
1997	15,564,321	840,539	12,207,913	2,515,869
1998	17,365,852	1,019,960	13,486,035	2,859,857
1999	19,145,304	669,909	15,468,935	3,106,749
2000	20,282826	425,532	16,991,509	2,655,156
2001	22,327,897	31,960	21,612,936	480,114

*Number of hooks set based on date of haulback.
Average hooks set per year, 1991 - 2001 = 15,390,956

Action area

The Hawaii-based longline fishery predominantly occurs in the Pacific Ocean between 1E and 50E north latitude, as far east as 135E west longitude, and as far west as 170E east longitude. The spatial distribution of effort in the tuna and swordfish components of the fishery between 1994 and 1999 is shown in Figures 2 and 3 (below). The swordfish component of the fishery historically has operated north of the Hawaiian archipelago and outside of the EEZ. The proposed action, which would allow a specific number of shallow sets, is therefore expected to result in an increase in longline effort in this northern area relative to 2001 and 2002. The proposed action also eliminates the seasonal closure in waters south of the Hawaiian archipelago, but as described above, that change was determined by NOAA Fisheries to have no effect on the short-tailed albatross.

Additional descriptions of the Hawaii longline fishery are included in other documents (Dollar 1991, Boggs and Ito 1993, Curran *et al*. 1996, He *et al.* 1997, WPRFMC 1998, Ito and Machado 1999, Bigelow *et al*. 1999, HLA and WPRFMC 2004, NOAA Fisheries 2004a, WPRFMC and NOAA Fisheries 2004).

Management and conservation measures

Under the Magnuson Act, U.S. pelagic fisheries in the central and western Pacific region are managed under the Fisheries Management Plan for Pelagic Fisheries of the Western Pacific Region (Pelagics FMP), as amended. The Pelagics FMP and its amendments (WPRFMC 1990, 1991, 1992, 1994) are developed by the WPRFMC under the authority of the Magnuson Act, and if these are approved by NOAA Fisheries, NOAA Fisheries implements them. The objective of the Pelagics FMP is to maximize the net benefits of the fisheries to the western Pacific region and the Nation. Background information on Federal fisheries policy and management under the Magnuson Act, the fishery management plan development process, and the Pelagics FMP is described in the March 2001 Final Environmental Impact Statement (Section 1.3, pages 11 - 34).

The proposed action under consultation is comprehensively described in NOAA Fisheries' April 2, 2004 final rule implementing regulatory amendment of the FMP (69 FR 17329) and in the biological assessment prepared by HLA and WPRFMC (2004). The rule includes numerous changes for the Hawaii-based longline fishery, including implementation of circle hooks and mackerel-type baits designed to minimize interactions with sea turtles. The management measures that constitute the action under consideration are summarized as follows:

- As directed by NOAA Fisheries, all vessels registered for use with Hawaii longline limited access permits (Hawaii longliner) must carry NOAA Fisheries-owned "vessel monitoring system" transmitters (59 FR 58789, November 15, 1994).

- All Hawaii-based longline vessels and fishing vessels registered for use with longline general permits are required to employ sea turtle handling measures specified by NOAA Fisheries, including mitigation gear, sea turtle resuscitation, and sea turtle release procedures, to maximize the survival of sea turtles that are accidentally taken by fishing gear (65 FR16346, March 28, 2000; future measures).

- Hawaii-based longline vessels operating north of 23 degrees North latitude (23°N) must: when using traditional tarred mainline, basket-style longline gear, ensure that the main longline is deployed slack to maximize its sink rate; when making deep sets using monofilament main longline, use a line-setting machine or line shooter and attach a weight of at least 45 grams (1.6 ounces) to each branch line within 1 m (3 ft) of each hook; use thawed blue-dyed bait; and discharge offal strategically (67 FR 34408, May 14, 2002).

- The operator and crew of all Hawaii-based longline vessels that accidentally hook or entangle an endangered short-tailed albatross must employ specific handling procedures (67 FR 34408, May 14, 2002).

- Operators and owners of Hawaii-based longline vessels and operators of registered for use under longline general permits are required to attend annual protected species workshops conducted by NOAA Fisheries that cover sea turtle and seabird conservation and deterrent techniques (67 FR 34408, May 14, 2002; future measures).

- There is an annual limit on the number of longline shallow sets that may be collectively made north of the equator by Hawaii-based longline vessels, set at 2,120 shallow-sets per year, which is divided and distributed each calendar year in equal portions in the form of transferable single-set certificates to all holders of Hawaii longline limited access permits that respond positively to an annual solicitation of interest from NOAA Fisheries. Shallow setting means the deployment of longline gear with any float line less than 65 ft (20 m) in length, with fewer than 15 branch lines between any two floats (except basket-style longline gear, the threshold for which is 10 branch lines between any two floats), with the use of lightsticks, or resulting in the possession or landing of more than 10 swordfish at any time during a given trip. Hawaii-based longline vessels are required to have on board, and to submit to NOAA Fisheries at the end of each trip, one valid shallow-set certificate for every shallow set made north of the equator (69 FR 17329, April 2, 2004).

- Hawaii-based longline vessels, when making shallow sets north of the equator, must use circle hooks sized 18/0 or larger with a 10-degree offset and only mackerel-type bait. These gear changes are thought to reduce the incidental take of sea turtles (NOAA Fisheries 2004a) (69 FR 17329, April 2, 2004).

- There are annual limits on the numbers of interactions between leatherback and loggerhead sea turtles and Hawaii-based longline vessels while engaged in shallow setting (69 FR 17329, April 2, 2004).

- The limit for each sea turtle species is equal to the annual estimated incidental take for the species in the shallow-set component of the Hawaii-based fishery (either incidental captures or incidental deaths, whichever limit is reached first) as established in the prevailing biological opinion issued by NOAA Fisheries pursuant to section 7 of the Act. When either one of the turtle interaction limits is reached, as determined from estimates derived from vessel observer data, the shallow-set component of the Hawaii-based longline fishery is closed for the remainder of the calendar year, after giving one week advance notice of such closure to all holders of Hawaii longline limited access permits (69 FR 17329, April 2, 2004).

- Operators of Hawaii-based longline vessels are required to notify the NOAA Fisheries Regional Administrator in advance of every trip whether the trip will involve shallow setting or deep setting, and such vessels are required to make sets only of the type declared (69 FR 17329, April 2, 2004).

- Operators of Hawaii-based longline vessels are required to carry and use NOAA Fisheries-approved de-hooking devices for sea turtles caught on longline gear (69 FR 17329, April 2, 2004).

- Hawaii-based longline vessels, when making shallow-sets north of 23°N, are required to start and complete the line-setting procedure during the nighttime, specifically, no earlier than one hour after local sunset and no later than local sunrise. This measure derives from the Service's November 28, 2000 biological opinion (69 FR 17329, April 2, 2004).

- Existing regulations require Hawaii-based longline vessels to accept vessel observers if required to do so by NOAA Fisheries, and NOAA Fisheries' February 23, 2004, biological opinion mandates 100% observer coverage for the shallow-set fishery, that is, every Hawaii-based longline vessel leaving port to target swordfish will carry a NOAA Fisheries observer. NOAA Fisheries intends to have 100% observer coverage in this fishery (69 FR 17329, April 2, 2004).

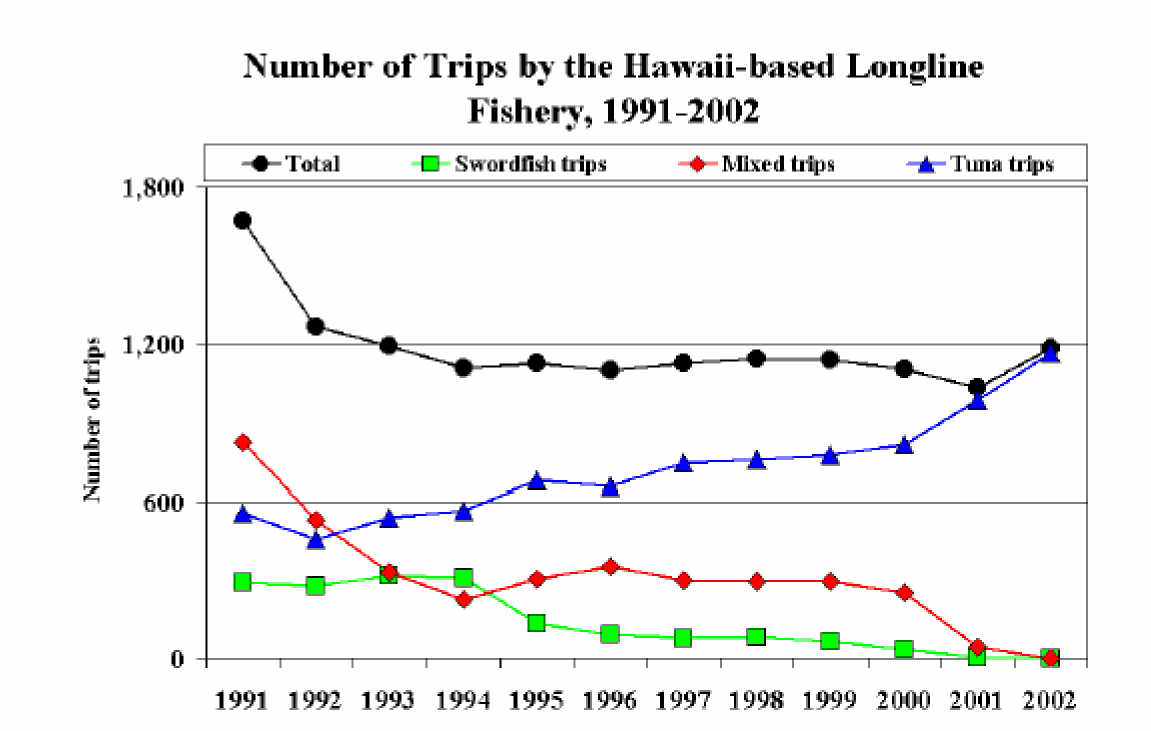

Figure 1. Number of trips in the Hawaii-based longline fishery, 1991-2002.
Sources: Ito and Machado 2001, NOAA Fisheries unpublished data.

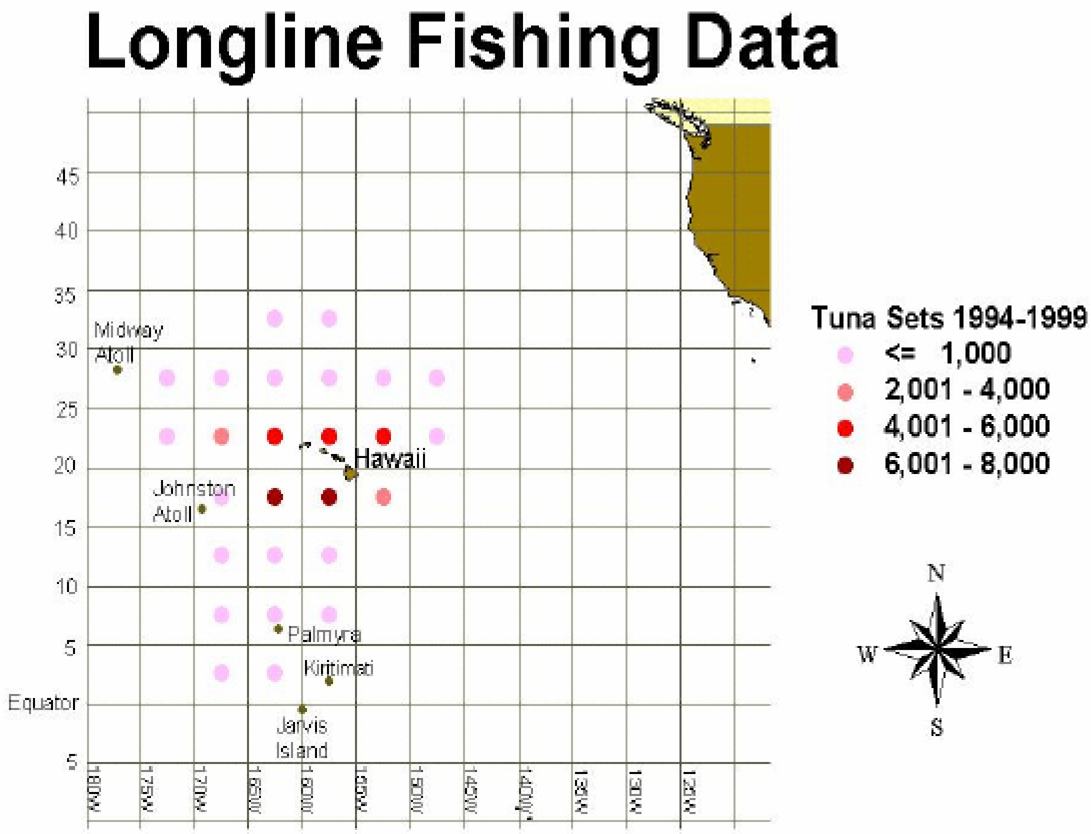

Figure 2. Distribution of fishing effort by the tuna sector of the Hawaii-based longline fishery, 1994-1999. Source: NOAA Fisheries 2004a.

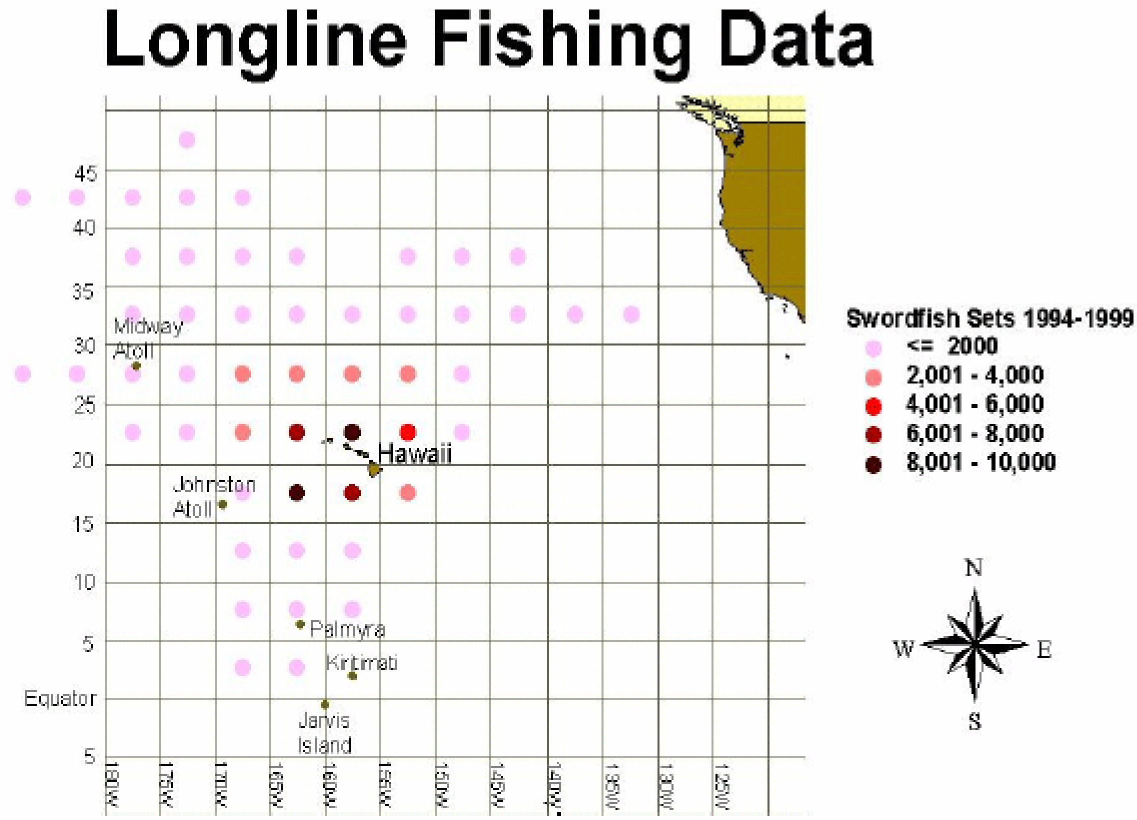

Figure 3. Distribution of fishing effort by the swordfish sector of the Hawaii-based longline fishery 1994-1999. Source: NOAA Fisheries 2004a.

II. Status of the Species

A. Species Description

George Steller provided the first record of the short-tailed albatross in the 1740s. The type specimen for the species was collected offshore of Kamchatka, Russia, and was described in 1769 by P.S. Pallas in Specilegia Zoologica (AOU 1998). In the order of tubenose marine birds, Procellariiformes, the short-tailed albatross is classified within the family Diomedeidae. Until recently, it was assigned to the genus *Diomedea*. Following results of the genetic studies by Nunn *et al*. (1996), the family Diomedeidae was arranged in four genera. The genus *Phoebastria*, North Pacific albatrosses, now includes the short-tailed albatross, the Laysan albatross (*P. immutabilis*), the black-footed albatross (*P. nigripes*), and the waved albatross (*P. irrorata*) (AOU 1998).

The short-tailed albatross is a large pelagic bird with long narrow wings adapted for soaring just above the ocean surface. The bill is disproportionately large compared with that of the other two northern hemisphere albatrosses; it is pink and hooked with a bluish tip, has external tubular nostrils, and has a thin but conspicuous black line extending around the base. Adult short-tailed albatrosses are the only northern Pacific albatross with an entirely white back. The white head develops a yellow-gold crown and nape in mature adult birds, but this plumage is not a prerequisite for breeding. Newly fledged birds are dark brown-black, but soon obtain pale bills and legs that distinguish them from black-footed albatross (Tuck 1978, Robertson 1980). Subadult birds have mixed white and brown-black areas of plumage, gradually getting more white feathers at each molt until reaching fully mature plumage.

B. Life History

Available evidence from historical accounts and from current breeding sites indicates that short-tailed albatross nesting habitat is characterized by flat or sloped sites with sparse or full vegetation on isolated windswept offshore islands with restricted human access (Arnoff 1960, Sherburne 1993, DeGange 1981). Current nesting habitat on Torishima Island is steep sites on soil containing loose volcanic ash; the island is dominated by a grass, *Miscanthus sinensis* var. *condensatus*, but a composite, *Chrysanthemum pacificum*, and a nettle, *Boehmeria biloba*, are also present (Hasegawa 1977). The grass probably stabilizes the soil, provides protection from weather, and minimizes mutual interference between nesting pairs while allowing for safe, open take-offs and landings (Hasegawa 1978). The nest is a grass- or moss-lined concave scoop about 2 ft (0.75 m) in diameter (Tickell 1975).

Short-tailed albatrosses are long-lived and slow to mature; the average age at first breeding is about 6 years (Service 1999). As many as 25 percent of breeding age adults may not return to the colony in a given year (Service 1999; Cochrane and Starfield 1999). Females lay a single egg each year, which is not replaced if destroyed (Austin 1949). Adult and juvenile survival rates are high (96 percent), and an average of 0.24 chicks per adult bird in the colony survive to fledge at six months of age (Cochrane and Starfield 1999). However, chick survival can be reduced severely in years when catastrophic volcanic or weather events occur during the breeding season.

At Torishima, birds arrive at the breeding colony in October and begin nest building. Egg-laying begins in late October and continues through late November. The female lays a single egg; incubation involves both parents and lasts for 64-65 days. Eggs hatch in late December and January, and by late May or early June the chicks are almost fully grown and the adults begin abandoning their nests (Service 1999; Hasegawa and DeGange 1982). The only known currently active breeding colonies of short-tailed albatross are on Torishima and Minami-kojima islands, Japan. The chicks fledge soon after the adults leave the colony, and by mid-July, the colony is deserted (Austin 1949). Non-breeders and failed breeders disperse from the breeding colony in late winter through spring (Hasegawa and DeGange 1982). There is no detailed information on phenology on Minami-kojima, but it is believed to be similar to that on Torishima. The political status of Minami-kojima is contested by Japan, Taiwan, and China; for this reason, human access to this island is extremely difficult.

Similar to other albatrosses, short-tailed albatrosses are monogamous and highly philopatric. Chicks hatched at Torishima return there to breed. However, individual birds may occasionally disperse from their natal colonies to breed, as evidenced by the appearance of adult birds banded as chicks on Torishima displaying courtship behavior at Midway Atoll (Service 1999, Richardson 1994).

The diet of short-tailed albatrosses includes squid, fish, flying fish eggs, and shrimp and other crustaceans (Hattori in Austin 1949, Service 1999). There is currently no information on variation of diet by season, habitat, or environmental condition.

Overall, the worldwide population of the short-tailed albatross has increased steadily over the past several decades (Fig. 4; Table 2). Observed annual increases in adults present at the colony, eggs laid, and chicks fledged indicate that the population at Torishima is estimated to be growing at a rate of between 6.5 and 7.5% per year.

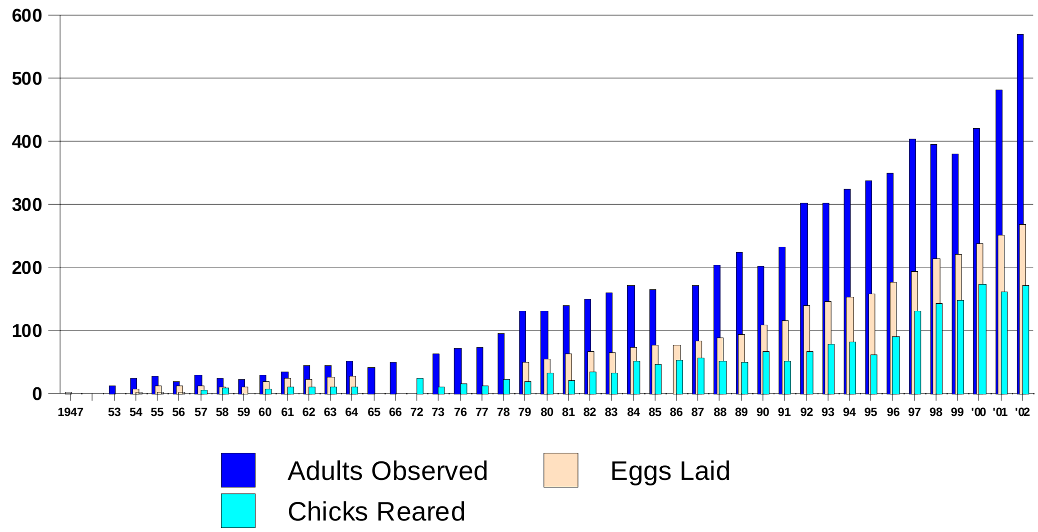

Figure 4. Short-tailed albatross population data from Torishima Islands, Japan (H. Hasegawa, pers. comm., 2003).

Table 2. Short-tailed albatross productivity, Torishima, Japan. Source: H. Hasegawa, pers. comm., 2004).

Fledge year	Birds on colony (excluding chicks)	Eggs	Fledged chicks
1995	324	153	82
1996	337	158	62
1997	349	176	90

Table 2, continued.

Fledge year	Birds on colony (excluding chicks)	Eggs	Fledged chicks
1998	403	194	130
1999	394	213	143
2000	c.380	220	148
2001	c.420	238	173
2002	481	251	161
2003	569	267	171
2004	603	277	193

C. Population Dynamics

The short-tailed albatross currently nests at two sites in the western Pacific Ocean: 1) Torishima, and 2) the Senkaku Islands. On the island of Torishima, most pairs nest at the Tsubame-zaki site, but a new colony is beginning to form on the northwest slope of the island. In the Senkaku Islands, most pairs nest on Minami-kojima, but in 2002 a chick also fledged from Kita-kojima, a nearby island.

Available data

The breeding success and population numbers of short-tailed albatrosses breeding on Torishima have been systematically monitored since 1976. Since 1976, Dr. Hiroshi Hasegawa has made annual trips to Torishima to count the number of eggs laid and chicks fledged. He has banded all chicks on the island since 1977. In the Senkaku Islands, chick counts were made in 1988, 1991, 1992, 2001, and 2002. No visits were made to the Senkaku Islands in 2003 or 2004.

Combining field data and modeling to estimate population size

Field data alone do not allow us to estimate the size of the short-tailed albatross population for the following reasons: 1) the number of eggs laid underestimates the total number of breeding pairs because not all breeding birds nest each year, 2) there is no reliable method for counting subadults in the population, and 3) data are collected opportunistically in the Senkaku Islands, so annual population indices are frequently unavailable. Therefore, to estimate the short-tailed albatross population size, it is necessary to combine available data with model predictions of missing values.

Sievert (2004) developed a simulation model that predicts the growth of the short-tailed albatross population on Torishima and the Senkaku Islands using estimated rates of age-specific survival and fecundity. Estimated model parameters for the two populations are:

Torishima:
1) Annual reproductive success = 64%,
2) Annual subadult survival = 94.1%
3) Annual adult survival = 96.7%
4) Percentage of adults breeding each year = 75%
5) All birds begin to breed at 6 years of age
These values were determined by running the population simulation model iteratively with different combinations of parameter values, within realistic ranges for albatross populations, until the best fit to the observed annual population growth of 7.5% was obtained. Observed rates of population growth were calculated using annual counts of fledglings. Observed reproductive success (chicks fledged/eggs laid) was used to guide selection of the reproductive success parameter in the model.

Senkaku Islands:
1) Annual reproductive success = 75%
2) Annual subadult survival = 96.5%
3) Annual adult survival = 98%
4) Percentage of adults breeding each year = 80%
5) All birds begin to breed at 6 years of age
These values were determined by running the population simulation model iteratively with different combinations of parameter values, within realistic ranges for albatross populations, until the best fit to the observed annual population growth of 11.0% was obtained. Observed rates of population growth were calculated using chick count data.

The estimated size of the short-tailed albatross population in 2004 is 1,990 individuals, of which 83% are associated with Torishima (Table 3). Due to the lack of frequent visits to the Senkaku Islands, the population estimate for those islands is likely to be less reliable than that for Torishima, where several visits are made annually.

Table 3. Short-tailed albatross population size in 2004, estimated using a combination of field research and simulation modeling (see text).

Age	Torishima	Senkaku Islands	Both Colonies
Fledglings	186	42	228
1-5 yrs old	634	141	775
Adult	832	155	987
All ages	1,652	338	**1,990**

D. Distribution and Population Status

Distribution

The short-tailed albatross once ranged throughout most of the North Pacific Ocean and Bering Sea, with known nesting colonies on numerous western Pacific Islands in Japan and Taiwan (Hasegawa 1979, King 1981). The discovery of a fossil short-tailed albatross colony on Bermuda dating to the mid-Pleistocene (420,000 to 362,000 years ago) confirms that this species once nested in the North Atlantic (Olson and Hearty 2003). Given its current nesting distribution, it is possible that the prehistoric breeding range of the short-tailed albatross was continuous across the north Pacific and included islands east of Japan. Short-tailed albatross courtship behavior and reproductive activities have been observed at Midway Atoll National Wildlife Refuge. The ability of Midway Atoll National Wildlife Refuge to serve as a successful nesting colony, through either natural colonization or translocation efforts, remains unknown (Service 1999).

At the beginning of the 20th century, the short-tailed albatross declined to near extinction, primarily as a result of hunting at breeding colonies in Japan. Albatross were killed for their feathers and various other body parts. The feathers were used for writing quills, their bodies were processed for fertilizer, their fat was rendered, and their eggs were collected for food (Austin 1949). Hattori (in Austin 1949) commented that short-tailed albatrosses were "...killed by striking them on the head with a club, and it is not difficult for a man to kill between 100 and 200 birds daily." He also noted that the birds were "very rich in fat, each bird yielding over a pint."

Pre-exploration worldwide population estimates of short-tailed albatrosses are not known; the total number of birds harvested may provide the best estimate, as the harvest drove the species nearly to extinction. Between approximately 1885 and 1903, an estimated 5 million short-tailed albatrosses were harvested from the breeding colony on Torishima (Yamashina in Austin 1949), and harvest continued until the early 1930s, except for a few years following the 1903 volcanic eruption. One of the residents on the island, a schoolteacher, reported 3,000 albatrosses killed in December 1932 and January 1933. Yamashina (in Austin 1949) stated that "[t]his last great slaughter was undoubtedly perpetrated by the inhabitants in anticipation of the island's soon becoming a bird sanctuary." By 1949, there were no short-tailed albatrosses breeding at any of the historically known breeding sites, including Torishima, and the species was thought to be extinct (Austin 1949).

In 1950, the chief of the weather station at Torishima, M. Yamamoto, reported nesting of the short-tailed albatross (Tickell 1973, 1975), and by 1954 there were 25 birds and at least 6 breeding pairs present on Torishima (Ono 1955). These were presumably juvenile birds that had been wandering the northern Pacific during the final several years of slaughter. Since then, as a result of habitat management projects, stringent protection, and the absence of any significant volcanic eruption events, the population has gradually increased. The average growth of the Tsubame-zaki colony on Torishima Island between 1950 and 1977 was 2.5 adults per year; between 1978 and 1991 the average population growth was 11 adults per year. An average annual population growth of at least 6 percent per year (Hasegawa 1982; Cochrane and Starfield 1999) has resulted in a continuing increase in the breeding population to an estimated total of

494 breeding pairs in 2004 (total for the species; P. Sievert, pers. comm., 2004). Torishima Island is under Japanese government ownership and management and is managed for the conservation of wildlife. There is no evidence that the breeding population on Torishima is nest site-limited at this point; therefore, ongoing management efforts focus on maintaining high rates of breeding success.

Two management projects have been undertaken to enhance breeding success on Torishima. First, erosion control efforts at the main colony have improved nesting success. Second, there are continuing attempts to establish a second breeding colony on Torishima by luring breeding birds to the opposite side of the island from the Tsubame-zaki colony through the use of decoys and recorded colony sounds. This site is relatively level, well vegetated, and less likely to be affected by lava or mud flows or erosion than Tsubame-zaki. Preliminary results of this experiment are promising; the single pair nesting in the decoy colony have fledged a chick each year since 1997. Although no new pairs have yet established nest sites in the decoy colony, an average of 10 birds has been observed in the decoy colony each evening during the breeding season (H. Hasegawa, pers. comm., 2002). The expectation is that, absent a volcanic eruption or some other catastrophic event, the population on Torishima will continue to grow, and it will be many years before the breeding sites are limited (Service 1999).

In 1971, 12 adult short-tailed albatrosses were discovered on Minami-kojima in the Senkaku Islands, one of the former breeding colony sites (Hasegawa 1984). Aerial surveys in 1979 and 1980 resulted in observations of between 16 and 35 adults. In April 1988, the first confirmed chicks on Minami-kojima were observed, and in March 1991, 10 chicks were observed. In 1991, the estimate for the population on Minami-kojima was 75 birds, including 15 breeding pairs (Hasegawa 1991).

Incidental observations at sea since the 1940s have indicated that in summer (*i.e.*, non-breeding season), short-tailed albatross appear to disperse widely throughout its historical range of the temperate and subarctic north Pacific Ocean (Sanger 1972; Service unpublished data), with observations concentrated in the northern Gulf of Alaska, Aleutian Islands, and Bering Sea (McDermond and Morgan 1993; Sherburne 1993; Service unpublished data). Individuals have been recorded along the west coast of North America as far south as the Baja Peninsula, Mexico (Palmer 1962). Satellite tracking of short-tailed albatross took place in 1996-1998 and 2001-2003. In all but one year, transmitters were affixed to birds in the Torishima colony, and the birds were tracked for a maximum of four months immediately following the breeding season. These birds all eventually moved north from Japan. In an effort to learn more about the short-tailed albatross's movements later in the year, four short-tailed albatrosses were captured at sea in August, 2003, and fitted with satellite transmitters. A summary map of short-tailed albatross satellite-tracking efforts in 2002 and 2003 indicate a wide distribution throughout the North Pacific (Fig. 5).

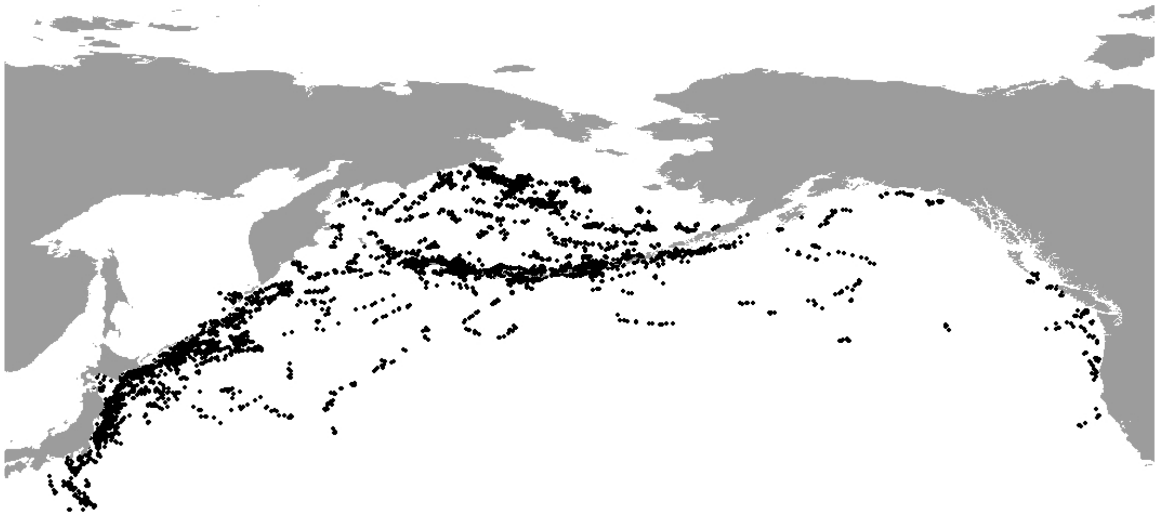

Figure 5. Summary map of the movements of 14 short-tailed albatrosses fitted with satellite transmitters in 2002 and 2003. Three of the tracked birds were captured and fitted with transmitters at sea in the western Aleutian Islands; the remaining 11 birds were captured on Torishima Island. Source: R. Suryan, pers. comm., 2004.

Short-tailed albatrosses have been observed on Midway Atoll since the early 1930s (Berger 1972, Hadden 1941, Fisher in Tickell 1973, Robbins in Hasegawa and DeGange 1982). There is one unconfirmed report of a short-tailed albatross breeding on Midway in the 1960s (Service 1999), but we have no subsequent reports of successful breeding. In the years following the reported observation, tens of thousands of albatrosses were exterminated from Midway Atoll to construct an aircraft runway for the Department of the Navy, and to provide safe conditions for aircraft landings and departures. It is possible that short-tailed albatrosses on the island could have been killed during this process (Service 1999). Since the mid-1970s, approximately thirty-five sightings of short-tailed albatrosses have occurred during the breeding season on Midway Atoll. In March 1994, a courtship dance was observed between two short-tailed albatrosses (Richardson 1994), and one lone female bird occupied a nest site and laid an egg in 1993, 1995, and 1997, none of which hatched (Service 1999). An encounter and some courtship behavior was observed by Service biologists between two short-tailed albatrosses (band numbers 015 yellow and 057 blue) on Sand islet, Midway Atoll, in November, 1999 (R. Shallenberger, Service, pers. comm., 2004). The U.S. Government transferred Midway Atoll from the Navy to the Department of the Interior in 1996, and has designated the Service as the conservation agency to manage Midway Atoll National Wildlife Refuge.

Observations of short-tailed albatross have also been made during the breeding season on Laysan Island, Green Island at Kure Atoll, French Frigate Shoals, and Pearl and Hermes Reef, but there is no indication that these occurrences represent breeding attempts (Sekora 1977, Fefer 1989, Chris Depkin, Service, pers. comm., 2004). Between 1976 and 1994, approximately seven different short-tailed albatrosses have been sighted from these islands. It is possible that short-tailed albatross could have occurred at these locations during the latter part of the 19^{th} century and first part of the 20^{th} century. If so, they would have been vulnerable to Japanese egg and feather collectors as thousands of black-footed and Laysan albatross were killed to support this trade during this period. In 1909, the Hawaiian Islands Bird Reservation was established by President Theodore Roosevelt (Executive Order 1019) to protect birds and their habitat, among other things.

Protection Status of the Species

Between the 1950s and 1970, there were few records of the species away from the breeding grounds (Tramontano 1970). In the North Pacific, there were 12 reported marine sightings in the 1970s, 55 sightings in the 1980s, and over 250 sightings reported in the 1990s to date (Sanger 1972; Hasegawa and DeGange 1982; Service unpublished data). This observed increase in opportunistic sightings should be interpreted cautiously, however, because of the potential temporal, spatial, and numerical biases introduced by opportunistic shipboard observations. Observation effort, total number of vessels present, and location of vessels may have affected the number of observations independent of an increase in total numbers of birds present.

The short-tailed albatross is not on the State of Hawaii's list of threatened and endangered species. However, the short-tailed albatross is considered endangered by the State of Alaska (Alaska Statutes, Article 4, Sec.16.20.19). The Japanese government designated the short-tailed albatross as a protected species in 1958, as a Special National Monument in 1962 (Hasegawa and DeGange 1982), and as a Special Bird for Protection in 1972 (King 1981). Torishima was declared a National Monument in 1965 (King 1981). These designations have resulted in tight restrictions on human activities and disturbance on Torishima (Service 1999). In 1992, the species was classified as "endangered" under the then-newly implemented "Species Preservation Act" in Japan, which makes Federal funds available for conservation programs and requires that a 10-year plan be in place, which sets forth conservation goals for the species. The current Japanese "Short-tailed Albatross Conservation and Management Master Plan" outlines general goals for continuing management and monitoring of the species, and future conservation needs (Environment Agency 1996). The principal management practices used on Torishima are legal protection, habitat enhancement, and population monitoring.

Prior to its current listing as endangered throughout its range, the short-tailed albatross was listed as endangered under the Act, throughout its range, except in the U.S. During this period, the Service considered the short-tailed albatross to be afforded protection under the Act in all portions of its range farther than 3 nautical miles (5.6 km) from U.S. shores, and included those waters of the EEZ (3-200 mi [5.6-370 km] from shore).

The exclusion of the U.S. from the range in which the species was listed resulted from an oversight in administrative procedures, rather than from any biological evaluation of the species' status within the U.S. The species was originally listed as endangered in accordance with the Endangered Species Conservation Act of 1969 (ESCA). Pursuant to the ESCA, two separate lists of endangered wildlife were maintained, one for foreign species and one for species native to the United States. The short-tailed albatross appeared only on the List of Endangered Foreign Wildlife (35 Federal Register [FR] 8495; June 2, 1970). When the current Act became effective on December 28, 1973, it superseded the ESCA. The native and foreign lists were combined to create one list of endangered and threatened species (38 FR 1171; January 4, 1974). When the lists were combined, prior notice of the action was not given to the governors of the affected States (Alaska, California, Hawaii, Oregon and Washington) as required by the Act, because available data were interpreted as not supporting resident status for the species. Thus, native individuals of this species were not formally proposed for listing pursuant to the criteria and procedures of the Act.

On July 25, 1979, the Service published a notice (44 FR 43705) stating that, through an oversight in the listing of the short-tailed albatross and six other endangered species, individuals occurring in the U.S. were not protected by the Act. The notice stated that it was always the intent of the Service that all populations and individuals of the seven species should be listed as endangered wherever they occurred. Therefore, the notice stated that the Service intended to take action as quickly as possible to propose endangered status for individuals occurring in the U.S.

On July 25, 1980, the Service published a proposed rule (45 FR 49844; July 25, 1980) to list, in the U.S., the short-tailed albatross and four of the other species referenced above. No final action was taken on the July 25, 1980, proposal. The Service designated the species as a candidate for listing in the U.S. (62 FR 49398; September 19, 1997). The Service published a proposal to list the short-tailed albatross as endangered in the U.S. (63 FR 58692) on November 2, 1998. A final rule was published on July 31, 2000 (65 FR 46643), listing the species as endangered throughout its range.

E. Threats

Volcanism

Short-tailed albatross face a significant threat at the primary breeding colony on Torishima, where an active volcano poses a constant threat of habitat destruction. The timing and magnitude of this threat are not predictable. Eruptions could be catastrophic or minor, and could occur at any time of year. A catastrophic eruption during the breeding season could result in chick and adult mortalities as well as destruction of nesting habitat. Significant loss of currently occupied breeding habitat or breeding adults at Torishima would delay and possibly preclude recovery of the species.

Torishima is an active volcano approximately 1,182 ft (394 m) high and 1.5 mi (3 km) wide (Service 1999) located at 30.48EN and 140.32EE (Simkin and Siebert 1994). The earliest record of a volcanic eruption at Torishima is a report of a submarine eruption in 1871 (Simkin and Siebert 1994), but there is no information on the magnitude or effects of this eruption. Since the first recorded human occupation on the island in 1887, there have been four formally recorded eruption events: 1) on August 7, 1902, an explosive eruption in the central and flank vents resulted in lava flow and a submarine eruption, and caused 125 human mortalities; 2) on August

17, 1939, an explosive eruption in the central vent resulted in lava flow, and caused two human mortalities; 3) on November 13, 1965, a submarine eruption and; 4) on October 2, 1975, a submarine eruption 4.4 nautical miles (9 km) south of Torishima (Simkin and Siebert 1994). There is also reference in the literature to an additional eruption in 1940 which resulted in lava flow that filled the island's only anchorage (Austin 1949).

Austin (1949) visited the waters around Torishima in 1949 and made the following observations: "The only part of Torishima not affected by the recent volcanic activity is the steep northwest slopes where the low buildings occupied by the weather station staff are huddled. Elsewhere, except on the forbidding vertical cliffs, the entire surface of the island is now covered with stark, lifeless, black-gray lava. Where the flow thins out on the northwest slopes, a few dead, white sticks are mute remnants of the brush growth that formerly covered the island. Also on these slopes some sparse grassy vegetation is visible, but there is no sign of those thick reeds, or 'makusa' which formerly sheltered the albatross colonies. The main crater is still smoking and fumes issue from cracks and fissures all over the summit of the island."

In 1965, meteorological staff stationed on the island were evacuated on an emergency basis due to a high level of seismic activity; although no eruption followed, the island has since been considered too dangerous for permanent human occupation (Tickell 1973). In late 1997, Hasegawa observed more steam from the volcano crater, a more pronounced bulge in the center of the crater, and more sulphur crusts around the crater than were previously present (Service 1999).

The eruptions in 1902 and 1939 destroyed much of the original breeding colony sites. The remaining sites used by albatrosses are on sparsely vegetated steep slopes of loose volcanic soil. The monsoon rains that occur on the island result in frequent mud slides and erosion of these soils, which can result in habitat loss and chick mortality. A typhoon in 1995 occurred just before the breeding season and destroyed most of the vegetation at the Tsubame-zaki colony. Without the protection provided by vegetation, eggs and chicks were at greater risk of mortality from monsoon rains, sand storms and wind (H. Hasegawa, pers. comm., 1997). Breeding success at the Tsubame-zaki colony site is lower in years when there are significant typhoons resulting in mud slides (Service 1999).

Torishima erupted during August and September 2002, and high numbers of earthquakes could be felt in February 2003. The albatrosses' breeding season was over when the eruption took place, however, and although ash is reported to have fallen on the colony site, the ultimate effects of this eruption on the colony site and the short-tailed albatross appear so far to be minimal (R. Suryan, Oregon State University, pers. comm., 2004). A potential result of ash fall from eruptions on the area of the colony is an increase in the fill rate of channels installed for erosion control (E. Flint, pers. comm., 2004).

In 1981, a project was supported by the Environment Agency of Japan and the Tokyo Metropolitan Government to improve nesting habitat by transplanting grass and stabilizing the loose volcanic soils (Hasegawa 1991). Breeding success at the Tsubame-zaki colony has increased following habitat enhancement (Service 1999). Current population enhancement efforts in Japan are concentrated on attracting breeding birds to an alternative, well-vegetated colony site on Torishima which is less likely to be affected by lava flow, mud slides, or erosion than the Tsubame-zaki colony site (Service 1999). Japan's "Short-tailed Albatross Conservation and Management Master Plan" (Environment Agency 1996) identifies a possible long-term goal of establishing additional breeding grounds away from Torishima once there are at least 1,000 birds on Torishima. The Service's Short-tailed Albatross Recovery Team, which includes both American and Japanese members, currently is drafting a recovery plan for the species. This plan will develop and prioritize a range of tasks including habitat enhancement, establishment of new colonies on other islands, and continued research on the ecology of the short-tailed albatross, fishery interactions, and ways to mitigate threats to the species' existence.

It should be noted that the risk of extinction caused by a catastrophic event at the breeding colony is buffered by behavior of adult and immature non-breeding birds. An average of 25 percent of breeding age adults do not return to breed each year (Service 1999), and immature birds do not return to the colony to breed until at least 6 years after fledging (Service 1999). As much as 50 percent of the current total worldwide population may be immature birds. If suitable habitat were still available on Torishima, these birds could recolonize in years following a catastrophic event.

<u>Diseases and Parasites</u>

We know of no diseases affecting short-tailed albatrosses on Torishima or Minami-kojima today. However, the world population is vulnerable to the effects of disease because of the small population size, the extremely limited number of breeding sites, and the genetic consequences of going through a severe population bottleneck within the last century. Hasegawa (pers. comm., 2002) reports that he has observed a wing-disabled bird every few years on Torishima, but the cause of the disability is not known.

Historically, several parasites were documented on short-tailed albatrosses on Torishima: a blood-sucking tick that attacks its host's feet, a feather louse, and a carnivorous beetle (Austin 1949). Ushijima *et al.* (2003) report collecting a tick (*Carios capensis*) from black-footed albatrosses nesting on Torishima. To date, however, we have no evidence to suggest that parasites have caused mortality or had population-level effects.

<u>Predation</u>

Sharks may take fledgling short-tailed albatrosses as they desert the colony and take to the surrounding waters (Harrison 1979). Shark predation of fledglings is well-documented among other albatross species, but has not been documented for short-tailed albatross. A species of crow, *Corvus* sp., is the only historically known avian predator of chicks on Torishima. Hattori (in Austin 1949) reported that one-third of the chicks on Torishima were killed by crows, but crows are not present on the island today (Service 1999). A record from the 1960s describes a short-tailed albatross chick taken by a Steller's sea eagle (*Haliaeetus pelagicus*). In recent years, these sea eagles have been seen taking an occasional black-footed albatross chick on Torishima, but are not believed to be a major threat to the short-tailed albatross (H. Hasegawa, pers. comm., 2002).

Black, or ship, rats (*Rattus rattus*) were introduced to Torishima at some point during human occupation. The effect of these rats on short-tailed albatross is unknown, but rats are known to prey on chicks and eggs of other seabird species (Atkinson 1985), and numerous rat eradication efforts have been undertaken to protect seabird colonies (Taylor *et al.* 2000, Service 2003). Cats (*Felis cattus*) were also present on Torishima, and were most likely introduced during the feather-hunting period. Cats have caused damage to other seabirds on the island (Ono 1955), and to seabirds elsewhere (*e.g.*, Moors and Atkinson 1984, Rauzon 1985, Smith *et al.* 2003), but there is no evidence of feral cat predation on short-tailed albatrosses. Cats were present on Torishima in 1973 (Tickell 1975), but Hasegawa (1982) did not find any evidence of cats on the island in 1979-1981.

Contaminants

Oil development has been considered in the past in the vicinity of the Senkaku Islands (Hasegawa 1981, *in litt.*). This industrial development would introduce the risk of local marine contamination, or pollution due to blow-outs, spills, and leaks related to oil extraction, transfer and transportation. Historically, short-tailed albatrosses rafted together in the waters around Torishima (Austin 1949) and small groups of individuals have occasionally been observed at sea (Service, unpublished data). An oil spill in an area where individuals are rafting could affect the population significantly.

North Pacific Commerical Fisheries

Commercial longline activities pose a serious threat to the short-tailed albatross throughout the species' range. U.S.-based demersal (deep sea) groundfish fisheries in Alaska are monitored by fishery observers who collect data on seabird bycatch. Reports of seabird bycatch are also occasionally received directly from fishermen. Two fishery-related mortalities of short-tailed albatross were reported in the 1980s (Table 4). The first bird, a recently fledged juvenile, was found dead in a fish net north of St. Matthew Island in July 1983. The second bird, also a fledgling, was taken by a vessel fishing for halibut in the Gulf of Alaska on October 1, 1987. In 1989, NOAA Fisheries began consulting with the Service on the effects of Alaska's groundfish fisheries on short-tailed albatrosses. Since 1990, there have been five reported takes of short-tailed albatrosses in Alaska's fisheries. A subadult (< 2 years) was taken south of the Krenitizin Islands in the hook-and-line fishery on August 28, 1995. A subadult (3 years) was taken in the Bering Sea Aleutian Islands (BSAI) hook-and-line fishery on October 8, 1995. A subadult (5 years) was taken in the Pacific Cod hook-and-line fishery on September 27, 1996. An adult (8 years) was taken in the BSAI Pacific cod hook-and-line fishery on September 21, 1998. A subadult bird of unknown age was taken in the BSAI Pacific cod hook-and-line fishery on September 28, 1998. Additional mortalities of unidentified albatrosses also have been reported.

Seven short-tailed albatross mortalities have been reported in Alaska-based fisheries since 1983 (Table 4). Three of these mortalities were reported since 1993, when fishery observers began reporting bird mortalities by species, during observed portions of the haulback. Because these reported mortalities represent only the observed portion of fishery operations, the total take in Alaska-based fisheries was estimated based on the observed takes of short-tailed albatrosses and the rate of observer coverage. This calculation resulted in a total estimated mortality of two short-tailed albatrosses per year in the Alaska-based hook-and-line groundfish fishery (Service 2003a). The current incidental take anticipated and authorized is four short-tailed albatross over two years in the Alaska-based hook-and-line groundfish fishery, and two additional short-tailed albatrosses in the Alaska-based trawl fishery in the period until a new biological opinion is issued (Service 2003b).

Table 4. Reported take of short-tailed albatross by Alaska-based fisheries.

Date	Location Description	Lat/Long	Fishery	Date Banded as Chick	Age at Take	Band(s) No. and Color
July 1983	300 mi north of St. Matthew Island	between 60N,180 and 58.5N, 175W	in net of vessel fishing for brown crab	20 March 1983	juvenile (4 months)	130-01562 orange 039
1 Oct. 1987	GOA	5927.7N, and 145 53.3W	halibut	5 April 1987	juvenile (6 months)	130-01836 red 173
28 Aug. 1995	South of Krenitizin Islands	53.31N, 165.38W	hook-and-line	16 April 1994	subadult (16 months)	13A0853 green 131
8 Oct. 1995	Bering Seas Aleutian Island (BSAI)	57.01 N, 170.39W	hook-and-line	21 April 1992	subadult (3 years)	---?? black 063
27 Sept. 1996	BSAI	5841.3N, 177 02.6W	hook-and-line	15 April 1991	subadult (5 yrs)	13A0518 green 057
21 Sept. 1998	BSAI	57.30 N, 173.57W	Pacific cod hook-and-line	18 April 1990	adult (8 years)	130-04189 brown 087
28 Sept. 1998	BSAI	58.27N, 175.16 W	Pacific cod hook-and-line	unknown	subadult	not known

Except for the 2nd take in 1998, leg bands were recovered from all of the above albatrosses allowing scientists to verify identification and age.

Until recently NOAA Fisheries' ability to monitor potential take of the short-tailed albatross in the Alaska-based trawl fishery has been limited to information collected incidentally by observers and researchers. These incidental observations are what brought to the agencies' attention the potential for short-tailed albatross take associated with the trawl fishery, thus supporting the need for first informal, and then formal consultation on this fishery. Data obtained from an electronic monitoring feasibility study in 2002 suggest that such remote monitoring may be a viable method for observing seabird deterrent use on trawl fishing vessels, and for observing seabird activity and interactions with trawl vessel third-wires (McElderry et al. 2004).

At its December 2001 meeting, the North Pacific Fisheries Management Council unanimously approved recommended changed to the existing regulations for seabird avoidance measures required in the groundfish and halibut fisheries off Alaska. Recommended changes were based on research results from Melvin *et al.* (2001), with modifications considered necessary to accommodate vessel length, vessel type, gear type, and area fished. These recommendations were formalized in a proposed rule published by NOAA Fisheries in 2003 (68 FR 6386).

In addition to U.S.-based fisheries, longline fishing is conducted in the Pacific by vessels from China, Japan, the Republic of Korea, Russia, and Taiwan. These distant water fleets traverse the waters of the North Pacific Ocean in search of swordfish and tuna. In 1997, most catches of swordfish by distant water longline fleets was between 20EN and 40EN, and 140EE and 175EE (WPRFMC 1999) (Appendix A-1). The greatest concentration of tuna catches by distant water longline fleets appeared north and east of the Hawaiian archipelago, west and north of Wake Atoll, and along the equator between 140EE and 135EW (WPRFMC 1999) (Appendix A-2). In 1995, swordfish catches by Japanese longline vessels were about 10,120 metric tons and were caught by vessels operating in the western, central, eastern and southern Pacific (Appendix A-3) (Dinardo 1999). From 1992 - 1994, swordfish catch by coastal longline vessels ranged between 1,181 and 1,394 metric tons (Dinardo 1999).

Recent fishing effort for bigeye tuna by Japanese longline vessels appears to have declined in the western Pacific from 150,761,600 hooks set in 1995 to about 144,444,800 hooks set in 1996. Fishing effort in the eastern Pacific appears to have stabilized at about 125,000,000 hooks set in 1995 and 1996. Overall fishing effort has decreased from 360,522,000 total hooks set in 1980 to about 269,444,800 hooks set in 1996 (Hampton *et al.*1998) (Appendix A-4).

Clearly, the Japanese longline fishing fleet represents a tremendous amount of fishing effort that in many instances overlaps with the currently known range of the short-tailed albatross (Fig. 6). Understanding foreign distant water fishing fleet effort is an integral part of analyzing the threat of foreign longline fishing activities to short-tailed albatross. However, in many fisheries, fishers may not be required to report seabird bycatch, may not be able to identify seabirds, or may face significant disincentives to do. To our knowledge, reporting seabird bycatch and the rates at which seabirds are caught is not reported by the foreign fishing nations mentioned in this section.

Hasegawa (pers. comm., 2002) reported that three or four short-tailed albatrosses come ashore each year on Torishima Island entangled in fishing gear or having swallowed a hook, and he posited that some of these birds may have died later as a result. He also stated that some take by Japanese handliners may occur near the nesting colonies, although no such take has been reported. There is no additional information on the potential effects of fisheries near Torishima on the species.

III. Environmental Baseline

The environmental baseline describes the status of the species and factors affecting the environment of the species or critical habitat in the proposed action area contemporaneous with this formal consultation. The baseline usually includes State, local, and private actions that affect a species at the time the consultation begins. Unrelated Federal actions that have already undergone formal or informal consultation are also a part of the environmental baseline. Federal actions within the action area that may benefit listed species or critical habitat are also included in the environmental baseline.

A. Status of the Species Within the Action Area

The action area for this consultation is where Hawaii-based longline fishery conducts shallow-set longline operations and overlaps with the range of the short-tailed albatross (Figs. 6 and 7). Based on the sighting record, an unknown number of short-tailed albatross traverse the waters near the Hawaiian archipelago, including the U.S. EEZ around Hawaii and international waters, where encounters with longline fishing vessels may occur. Therefore, the effects of the action can occur in the area where the Hawaii-based longline fishery overlaps with the range of the species. The environmental baseline for this consultation includes the status of the species as a whole, as described above, including the current known natural and anthropogenic threats to the species.

B. Factors Affecting Species' Environment Within the Action Area

Breeding Habitat

Midway Atoll has been identified as a possible site for establishing an additional breeding colony (Service 1999). Midway Atoll National Wildlife Refuge is a logical candidate because it is visited by short-tailed albatross that have displayed reproductive capacity (*e.g.*, courtship dances and egg-laying). Furthermore, Midway Atoll is under the authority and control of the U.S. Federal government (Service) and our ability to regulate activities conducted on the atoll could

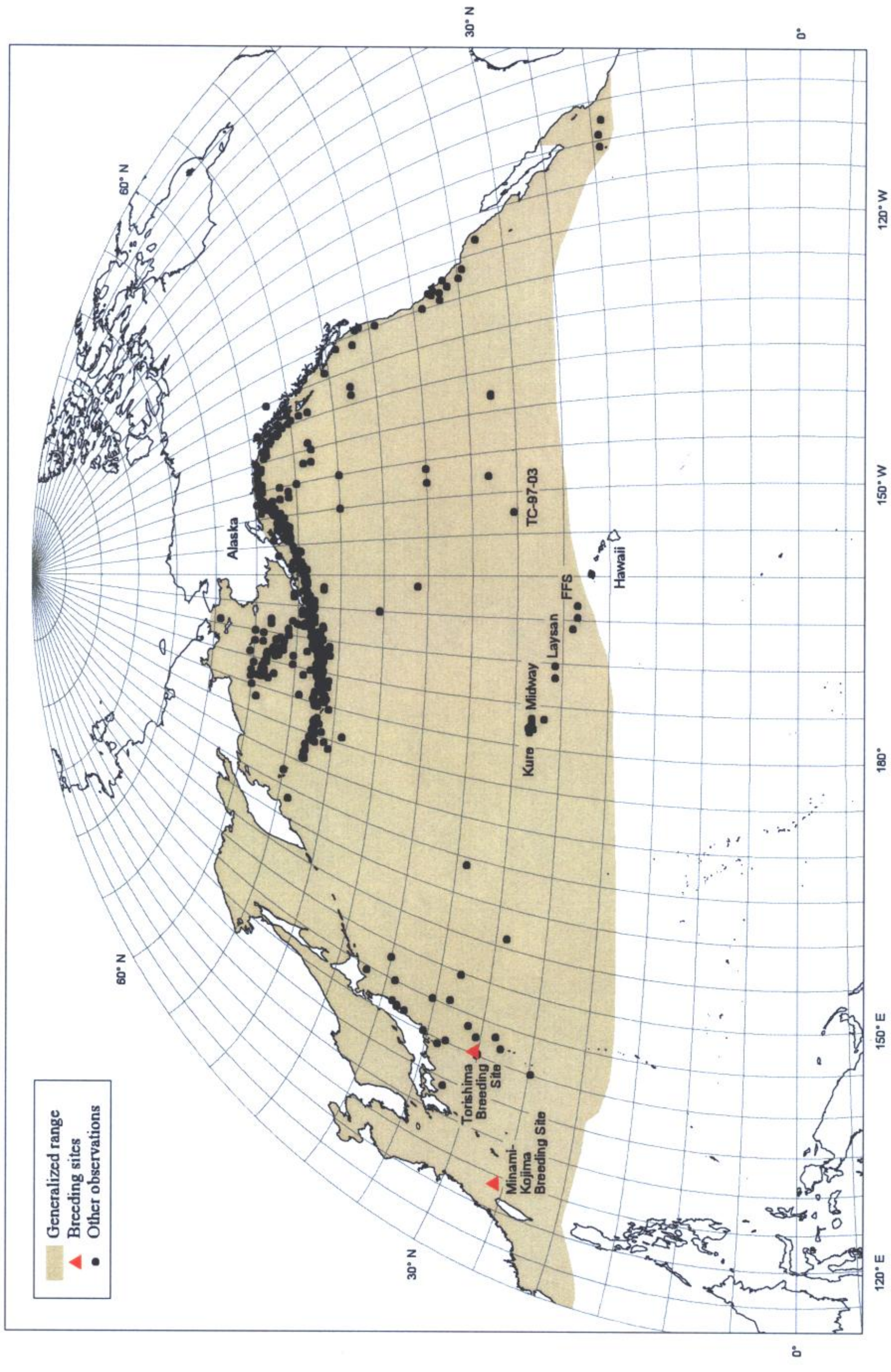

Figure 6. Observations, breeding sites, and generalized range of the short-tailed albatross**.**

promote expansion of the short-tailed albatross population. The decoy colony at Midway is maintained with regular refurbishment of the decoys and audio play-back system (J. Klavitter, pers. comm., 2004). Until other safe breeding sites are established, short-tailed albatross survival will continue to be at risk due to the possibility of significant habitat loss and mortality from unpredictable natural catastrophic volcanic eruptions and land or mud slides caused by monsoon rains.

Contaminants

Oil contamination can harm short-tailed albatrosses through either direct toxicity or interference with the bird's ability to thermoregulate. Oil spills can occur in many parts of the short-tailed albatross' marine range, including within the action area. The species' habit of feeding at the surface of the sea makes them vulnerable to oil contamination. Hasegawa (pers. comm., 2002) has observed some birds on Torishima with oil spots on their plumage. Oiled breast feathers on incubating adults may lead to embryo mortality. Studies have shown that less than a microliter of oil on a common eider egg will kill the chick (K. Trust, pers. comm., 2003)

Consumption of plastics may also be a factor affecting the species' survival. Albatrosses often consume plastics at sea, presumably mistaking the plastics for food items, or in consuming marine life such as flying fish eggs which are attached to floating objects. Hasegawa (pers. comm. 2002) reports that short-tailed albatrosses on Torishima commonly regurgitate large amounts of plastic debris. Plastics ingestion can result in injury or mortality to albatross if sharp plastic pieces cause internal injuries, or through reduction of ingested food volumes and dehydration (Sievert and Sileo 1993). Young birds may be particularly vulnerable to potential effects of plastic ingestion prior to developing the ability to regurgitate (Fefer 1989, *in litt.*). Auman (1994) found that Laysan albatross chicks found dead in the colony had significantly greater plastic loads than chicks injured by vehicles, a sampling method presumably unrelated to plastic ingestion, and therefore representative of the population. Hasegawa (pers. comm., 2002) observed a large increase in the occurrence of plastics in birds on Torishima between 1992 and 2002, but the effect on survival and population growth is not known.

Pacific Fisheries Based Outside Hawaii

Longline fisheries in the North Pacific Ocean and Bering Sea pose a serious threat to the short-tailed albatross, as described above in the Status of the Species section. Non-U.S. distant water longline fleets may operate within the action area, which includes waters outside the U.S. EEZ. Data on the distribution and effort of distant water longline fleets from outside the U.S. is integral to analyzing the threat posed by foreign fisheries to the short-tailed albatross. Despite significant international initiatives in recent years to address this problem globally, there is still little information available on the magnitude of this threat.

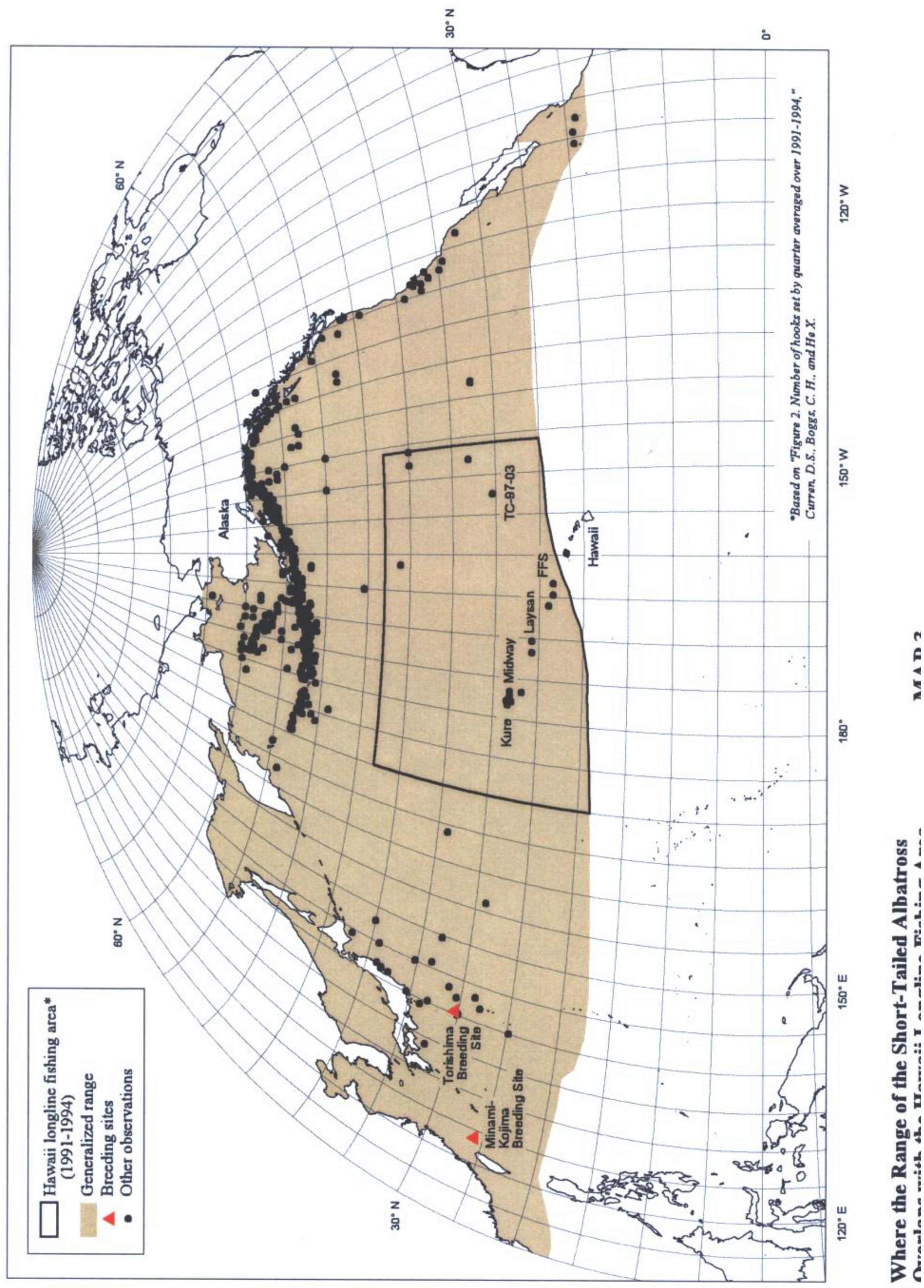

Figure 7. Overlap of the Hawaii-based longline fishery and the range of the short-tailed albatross.

Air Strikes

No collisions of short-tailed albatross with aircraft have been documented at Midway Atoll National Wildlife Refuge. Seabird collisions with airplanes have been documented by the Service on Midway Atoll National Wildlife Refuge since operation of the airfield was transferred from the Department of Defense to the Department of Interior in July 1997. Since the closure of Midway Phoenix Corporation's activities at Midway in 2002, air traffic to Midway is reduced significantly. In May of 2004, Aloha Airlines discontinued charter service to Midway, further reducing the amount and type of air traffic at the refuge. Currently, the only aircraft that serves Midway on a regular basis is a Gulfstream G-1 aircraft operated by Maritime Air, which makes one flight each week on a charter basis (J. Klavitter, pers. comm., 2004). Most flights arrive and depart in darkness during the peak of the albatross nesting season, mid-November to mid-July, to minimize hazards to seabirds. The lighting at the air terminal for these flights may result in the deaths of an estimated one albatross (Laysan or black-footed) and three to four Bonin petrels (from collisions with the terminal building) (J. Klavitter, pers. comm., 2004). The U.S. Coast Guard conducts daytime operations at Midway Atoll roughly once every two months, using C-130 aircraft.

Since acquiring the airfield, the Service has implemented several precautionary mechanisms to reduce and document seabird collisions. Transient aircraft (primarily U.S. military or U.S. Coast Guard C-130s) are required to obtain prior permission from the refuge manager before landing at Midway Atoll National Wildlife Refuge. Aircraft are advised to land within the parameters provided by airfield operations to reduce air collisions with seabirds.

Prior to any aircraft landing or takeoff, the runway and taxiways are "swept" to haze any birds resting on the airfield or upwind of the runway. In most cases, birds are simply escorted or "shooed" about 300 ft (100 m) downwind of the active runway by refuge and Chugach McKinley, Inc. (contractor) staff. Staff also remove birds that occur upwind of the runway because they may fly into the path of the oncoming plane. If these staff encounter "stubborn" adult birds that refuse to be escorted or chicks that have wandered onto the runway, the staff physically remove them to a safe distance downwind of the active runway.

Due to the size of the runway at Midway Atoll National Wildlife Refuge, refuge and contractor staff use vehicles to reach all points of the active runway, taxiways or areas upwind of the runway that are occupied by birds. During nesting seasons, runway sweeps become more involved with several crews removing birds from the runway. Finally, refuge staff provide bird activity advisories to pilots and recommend modified approaches and landings at the airfield to avoid collisions with birds.

The Service has collected information concerning aircraft type and movement and the incidence of bird strikes since the last contingent of Navy personnel left Midway on June 30, 1997. Please see the November 2000 Opinion to review those data for the period from July 1, 1997 to June 1, 2000.

A female short-tailed albatross (band: yellow 015, band lost in 2002) has resided about 150 ft (50 m) from the end of the Midway Atoll National Wildlife Refuge runway since 1989, and she is known to reside on the island during the nesting season, from November to April. Although the bird is located close to the runway, an aircraft is unlikely to collide with her because albatrosses are less likely to fly at night and most landings and takeoffs occur at night during the period this bird resides at Midway. There have been no reports of “yellow 015" having a close encounter with aircraft, according to ground crews at Midway Atoll National Wildlife Refuge (R. Dieli, Service, pers. comm., 2000).

The Service operates a very limited air service to Tern Islet, French Frigate Shoals, to support ongoing conservation and research activities associated with the mission of this refuge. Similar to the procedure at Midway, the Service provides advisories to incoming pilots and conducts pre-landing and takeoff “sweeps” to remove birds from the active runway. During the course of a year, a small number of birds are injured and killed as a result of landing-and takeoff-related activities. Short-tailed albatross have never been observed on or near Tern Islet during airplane landing and takeoff activities. Therefore, the Service does not consider this a threat of injury or mortality to short-tailed albatross.

<u>Other Factors</u>

A small number of Laysan and black-footed albatross are killed at Midway Atoll National Wildlife Refuge due to collisions with ironwood trees, power lines, or buildings and due to entrapment in confined spaces (*e.g.*, seawalls). Collisions therefore are a potential risk for short-tailed albatrosses at Midway, albeit a very small risk. A priority for the refuge is to minimize these hazards, and the staff removes ironwood trees and unnecessary wires and poles (T. Bodeen, pers. comm., 2004). These efforts are reducing the hazard to seabirds, but these hazards are unlikely to be eliminated permanently.

IV. Effects of the Action

The potential exists for take to occur as a result of the proposed changes to the fishery, that is, the limited resumption of swordfish-target longlining. Therefore, in an effort to ensure the long-term survival of the species, NOAA Fisheries formally consulted with the Service under section 7 of the Act on this proposed action and the anticipated take that may occur as a result of interaction with short-tailed albatross. Fishing activities covered under this consultation will occur within the U.S. EEZ and international waters. The effects of the action on this species will potentially occur where the range of the short-tailed albatross, in the North Pacific Ocean, overlaps with the area where the Hawaiian longline fleet conducts fishing operations (Figs. 6 and 7).

Sighting records indicate that short-tailed albatross have been observed in the Northwestern Hawaiian Islands since the 1930s. Although interactions between short-tailed albatross and gear deployed from Hawaii-based longline vessels have not been observed, short-tailed albatrosses have been observed at sea in areas where the Hawaii-based longline fishery historically has fished for swordfish, and where Laysan and black-footed albatross have been reported to be killed by longline fishing gear. The most recent of these sightings took place in January, 2004, from a California-based vessel fishing within the area where the Hawaii-based fishery operates (see below). The short-tailed albatross population is very low compared to historical estimates (current estimate: 1,990 birds [Sievert 2004]; historical estimate: about 5,000,000 birds), and an unknown fraction of the short-tailed albatross population temporarily resides in or passes through the Hawaiian archipelago and areas where the proposed fishing operations will be conducted.

To date, observations of short-tailed albatross and records of the incidental take of short-tailed albatross in fishery operations have been very few, and none of the observations of take have come from the Hawaii-based fishery. This is because very little time has been spent observing seabird interactions with the fishery, historically, and only a few short-tailed albatross have been observed to occur in the vicinity of the fishing grounds. Since 2001 the tuna-target sector of the Hawaii longline fishery has had 20% observer coverage, with observers on at least 5% of the trips north of 23ºN dedicated to documenting seabird behavior and interactions with fishing operations.

NOAA Fisheries began estimating the number of Laysan and black-footed albatross interactions in the Hawaii-based longline fishery in 1994. Several thousand Laysan and black-footed albatross were estimated to be taken each year by fishing gear deployed by the Hawaii-based longline vessels between 1994 and 2000. After this time shallow-set effort decreased sharply and then ceased in 2001 (McCracken 2001, NOAA Fisheries 2003a and unpublished data). Since 2001, albatross mortality in this fishery has decreased.

A. Factors to Be Considered

The probability of short-tailed albatross being taken on longline gear and of the take being reported is a function of many factors, including: (1) temporal and spatial overlap of the distribution of short-tailed albatross at sea and the distribution of longline vessels' fishing operations, (2) albatross foraging behavior, (3) total number of baited hooks set per unit time, and the species targeted by the longline fishing vessels, (4) use and effectiveness of seabird deterrent devices, (5) type of fishing gear used, (6) length of time longline gear is at or near the surface of the water during the set, and to a lesser degree during the haulback, (7) behavior of the individual bird, (8) water and weather conditions (*e.g.*, sea state), (9) availability of food items for birds (including bait and offal), and (10) physical condition of the bird. The number of birds affected by fishing operations is also a function of population size; as the short-tailed albatross population increases, we expect a concomitant increase in fishery interactions and in the number of birds killed. The probability of a hooked short-tailed albatross being reported is a function of (1) observer coverage (100% in the case of vessels targeting swordfish), (2) the prioritization of the observers' duties and the training they receive, and (3) the observation skills and reporting accuracy of these individuals.

Observations of Short-tailed Albatrosses in Hawaii and in the Action Area

Short-tailed albatrosses have been observed in the vicinity of the Northwestern Hawaiian Islands typically between November and April. Since 1938, approximately 50 observations of about 17 different short-tailed albatross have been sighted from or near land (Table 5). Short-tailed albatross have been observed from Midway Atoll (Sand and Eastern Islets), Laysan Island, French Frigate Shoals (Tern Islet), Pearl and Hermes Reef (Southeast Islet), and Kure Atoll (Green Islet). Sightings of short-tailed albatross from land represent the majority of all sightings. The Pacific Ocean Biological Survey Program produced no at-sea observations of short-tailed albatross in the vicinity of the Northwestern Hawaiian Islands, but this survey program was conducted at a time (1960s) when the short-tailed albatross population was very low. Three marine observations of short-tailed albatross have been recorded by NOAA Fisheries employees, including fishery observers, within the area where the Hawaii-based fishery operates. These observations took place in 1997, 2000, and 2004.

Table 5. Short-tailed albatross sightings in the Hawaiian Islands, 1938-2004 (USFWS unpublished data).

Year	Month or Season	Day	Location	No. Birds	Description
1938	Dec.	---	Midway/Sand Is.	1	Immature
1939	Dec.	---	Midway/Sand Is.	1	Injured and died
1940	Nov.	28	Midway/Sand Is.	1	Immature
1965	winter	---	Midway Islands	1	Immature
1966	Mar.	18	Midway/Eastern Is.	1	Immature banded[1]
1972	Nov.	---	Midway/Sand Is.	1	Band 558-30754[2]
1973	May	---	Midway/Sand Is.	1	Band 558-30754
1973-74	fall - winter	---	Midway/Sand Is.	1	Band 558-30754
1974-75	fall - winter	---	Midway/Sand Is.	1	Band 558-30754
1976	Mar.	---	Laysan Is.	1	Immature-unbanded
1976	winter	---	French Frigate Shoals/ Tern Is.	1	Immature-unbanded
1976	winter	---	Midway/Sand Is.	1	Band 558-30754
1977	Dec.	---	Midway/Sand Is.	1	Band 558-30754
1978-79	Oct.-Jan.	---	Midway Is.	1	Band 558-30754
1979-80	Nov.-Jan.	---	Midway/Sand Is.	1	Band 558-30754
1980	Jan.	13	French Frigate Shoals/ Tern Is.	1	Unknown
1980	Dec.	12	Midway/Sand Is.	1	Band 558-30754

Table 5, continued.

Year	Month or Season	Day	Location	No. Birds	Description
1981	Oct.-Dec.	---	Midway/Sand Is.	1	Band 558-30754
1981	Feb.	25	Midway/Sand Is.	1	Immature unbanded
1982	Jan.	25	French Frigate Shoals/ Tern Is.	1	Unknown
1982-83	Nov.-Feb.	---	Midway/Sand Is.	1	Band 558-30754
1984	Dec.	15	Midway/Sand Is.	1	000 white[3]
1985	Nov.	20	Midway/Sand Is.	1	000 white
1987	Feb.-Mar.	---	Midway/Sand Is.	1	000 white
1988	Dec.	2	Midway/Sand Is.	1	000 white
1989	Dec.	8 - 12	Midway/Sand Is.	2	015 yellow[4] and 000 white
1990-91	Fall-Winter	---	Midway/Sand Is.	2	015 yellow and 000 white
1991-92	Dec.-Mar.	---	Midway/Sand Is.	2	015 yellow and 000 white
1992-93	Dec.-Jan.	---	Midway/Sand Is.	2	015 yellow and 000 white
1993-94	Oct.	26	Midway/Sand Is.	2	015 yellow and 000 white
“	Jan.	11	“	“	Sitting on infertile egg
“	Mar.	9	“	“	Seen together for the first time
1994	Feb.-Mar.	9	French Frigate Shoals, Tern Is.	1	047 yellow[5]
1994	Mar.	24	Kure Atoll/ Green Is.	1	043 yellow
1994	Nov.	3	Midway/Sand Is.	2	015 yellow and 000 white
1995			“	1	015 yellow
1995-96	fall-winter	8	Midway/Sand Is.	2	015 yellow incubated infertile egg and 172 black[6]
1995-96	Dec.-Feb.	---	Midway/Eastern Is	1	051 red-orange[7]
1997	Nov.	4	Midway/Sand Is.	1	015 yellow incubated infertile egg
1998-99	Nov.-Feb.	---	Midway/Sand Is.	1	015 yellow
1999	Feb.	5-6	Midway/Eastern Is.	1	057 blue[8]

Table 5, continued.

Year	Month or Season	Day	Location	No. Birds	Description
1999	Nov.	5	Midway/Sand Is.	1	057 blue
1999	Feb.-May	---	Midway/Sand Is.	1	057 blue present intermittently
1999-2000	28 Oct.-20 Nov.		Midway/Sand Is.	1	015 yellow present intermittently
"	27 Nov.-16 Apr.		"	"	"
1999	Oct.	31	Midway/Eastern Is.	1	051 red
"	Nov.	11	"	"	"
"	Dec.	22	"	"	"
1999-2000	27 Dec.-1 Feb.		Midway/Eastern Is.	1	051 red
1999-2000	17 Nov.-26 Jan.		Midway/Sand Is.	1	057 blue present intermittently near NAVFAC
2000	Mar.	28	Kauai/Pacific Missile Range Facility	1	Juvenile resting in grass on mountain side of runway
2000-2001	30 Oct.-17 Apr.		Midway/Eastern Is.	1	051 red
2000-2001	24 Oct.-11 Apr.		Midway/Sand Is.	1	015 yellow present intermittently
2001	Jan.	8-9	Midway/Sand Is.	1	Black 133 lf, 13A-0703 metal rt.[9] South Beach overlook
2001	Mar.	28	Midway/Eastern Is.	1	057 orange SW end of runway
2001-2002	29 Oct.-17 Apr.		Midway/Eastern Is.	1	051 red rt, metal lf, decoy plot
2001-2002	25 Oct.-11 Apr.		Midway/Sand Is.	1	015 yellow incubated infertile egg, color band lost
2002	Feb.	2	French Frigate Shoals/Tern Is.	1	Adult observed flying over the north side of island
2002-2003	11 Nov.-28 Mar.		Midway/Eastern Is.	1	Adult, metal band lf, in decoy plot, nest cup

Table 5, continued.

Year	Month or Season	Day	Location	No. Birds	Description
2002-2003	27 Oct. - 25 Mar.		Midway/Sand Is.	1	Metal band rt, south side of runway, prob. "015 yellow"
2003	Jan.	1-15	Midway/Sand Is.	1	Juvenile (unbanded?) seen on land twice at bulky dump
2003-2004	28 Oct.-3 Apr.		Midway/Eastern Is.	1	Adult, metal band lf: 130-01319? decoy plot, courting decoy
2004	Apr.	22	Pearl and Hermes Reef/Southeast Is.	1	Subadult flying over water within one mile of islet

Sources: Data supplied by R. Pyle, Bishop Museum, Hawaii and Service National Wildlife Refuge reports. 1940-1962: No records available.

[1] Chandler Robbins banded the bird with two USFWS bands (nos. 767-95701 and 767-95702)

[2] Bird was banded as a chick on Torishima 10 March 1964

[3] Bird was first banded as a chick on Torishima, March 1979

[4] Bird was first banded as a chick on Torishima, March 1982

[5] Bird was first banded as a chick on Torishima, April 1989

[6] Bird was first banded as a chick on Torishima, April 1993; bird had all dark plumage.

[7] Bird was first banded as a chick on Torishima, (either April 1987 or 1990).

[8] Bird was first banded as a chick on Torishima, April 1988.

[9] Bird was first banded as a chick on Torishima, August 1993.

A short-tailed albatross (band: yellow 047) was observed for nine days on Tern Island, French Frigate Shoals Atoll, Hawaiian Islands National Wildlife Refuge during the winter of 1994.

A male short-tailed albatross with band “white 000" was banded as a chick at Torishima in 1978. This bird was first recorded at Midway Atoll on 15 December 1984 (Table 5). After that, this returned each year in December and left each spring, usually in April, until its disappearance in the fall of 1994. The bird was almost always seen in the same area on the south side of Sand Islet. The bird’s pattern of behavior in the breeding season was to sit in the colony except for occasional trips of two or three days length out to sea. In March 1994, “white 000" was observed and video-taped dancing with “yellow 015,” a female short-tailed albatross hatched at Torishima in 1983 that had been coming to another part of Sand Islet since 1989. “White 000" returned again in the fall of 1994 but failed to return after a routine foraging trip soon thereafter. There was heavy longline fishing activity and high black-footed and Laysan albatross mortality as measured by the observer program north of Midway Atoll during 1994. The bird has never been sighted again in any of the Northwestern Hawaiian Islands nor at Torishima. This bird was a young adult that over 10 years had consistently occupied a territory at Midway Atoll, and adult short-tailed albatross have no natural at-sea predators while foraging. Therefore, the Service maintains that “white 000" may have been taken in the Hawaiian longline fishery.

On March 28, 1997, a short-tailed albatross was observed during haulback operations by a NOAA Fisheries fishery biologist aboard the NOAA Research Vessel (*R/V*) *Townsend-Cromwell* (Appendix A-5). In the early morning hours, the short-tailed albatross was observed to be flying in a clockwise circle over the baited hooks which were being hauled back at the starboard/stern area of the vessel. The biologist noted that the “short-tail was actively looking for bait on hooks in the haulback.” The biologist noted that at least 30 black-footed albatross and one Laysan albatross were also observed flying over baited hooks during haulback operations. The time and position of the vessel during haulback was: haulback began at 8:04am - 30º 28' 070" north latitude and 153º 43' 570" west longitude; haulback ended at 9:21am - 30º 28' 822" north latitude and 153º 37' 952" west longitude. About 150 hooks were deployed during the set.

The biologist was studying the effectiveness of the “tori line,” a device to haze seabirds from baited hooks deployed by fishing vessels. However, the tori line was not deployed at the time of the sighting of the short-tailed albatross. During the course of the cruise, the biologist documented the behavior of at least 91 black-footed albatrosses and six Laysan albatrosses during five experimental sets during the period of 24 - 28 March 1997.

This was the first documented sighting of a short-tailed albatross from a vessel in the vicinity of the Hawaiian Islands. This also was the first time staff on a research vessel cruise in the vicinity of the Northwestern Hawaiian Islands included a biologist trained specifically to identify seabirds and record their behavior. In the past, NOAA Corps Officers untrained in seabird identification have recorded opportunistic sightings of seabird species. Since 1989, the *R/V Townsend-Cromwell* has conducted about 21 longline research cruises that typically last about 15 - 30 days each.

On this particular cruise (Cruise TC-97-03 [TC-281], March 20 - April 18, 1997), the *R/V Townsend-Cromwell* operated about 480 to 780 nautical miles (889 to 1445 km) off the island of Oahu, Hawaii. Longline fishing operations were conducted using monofilament longline gear in conjunction with hook timers and time-depth recorders to study the habitat utilization, hooked longevity, and vulnerability to fishing gear of broadbill swordfish (*Xiphias gladius*). During the cruise, the crew of the *R/V Townsend-Cromwell* tagged, released and sampled about 76 fish. The types of fish caught during the cruise included: 26 blue sharks (*Prionace glauca*), 12 broadbill swordfish (*Xiphias gladius*), 20 mahimahi (*Coryphaena hippurus*), 16 longsnout lancetfish (*Alepisaurus borealis*), one albacore tuna (*Thunnus alalunga*), and one snake mackerel (*Gempylus serpens*).

On January 23, 2000, a short-tailed albatross was observed flying near a Hawaii-based longline fishing vessel while hauling back longline gear. The observation was recorded by a NOAA Fisheries fishery observer. The sighting occurred at 8:37 a.m. at 33º9'2" north latitude and 147º49'6" west longitude. The bird was observed flying in a group of about 10 to 15 black-footed albatrosses and was in sight of the longline vessel, circling it for approximately 90 minutes. Although some of the black-footed albatrosses in this group were feeding on discarded bait, the short-tailed albatross was not observed feeding on bait. The observer judged the bird to be a juvenile. It had a large, bright pink bill and completely brown plumage. No seabird mitigation methods were employed at the time of the sighting.

On March 28, 2000, a juvenile short-tailed albatross was observed by Mr. Richard Daley at the Pacific Missile Range Facility (PMRF), Barking Sands, Kauai, Hawaii, at just above 22º north latitude. The bird was observed at 5:30 p.m., and was observed to be resting in the grass on the mountain side of the PMRF runway (R. Daley, in litt. in R. Pyle, Bishop Museum, pers. comm., 2004).

On November 4, 2001, in a meeting to review the protected species workshops held by NOAA Fisheries, NOAA Fisheries staff stated that two or three fishermen said they had seen a short-tailed albatross during longline trips, but whether these fishermen had correctly identified short-tailed albatrosses is not clear (Karla Gore, NOAA Fisheries, pers. comm., 2002).

On February 2, 2002 one adult short-tailed albatross was observed flying over the north side of Tern Island, French Frigate Shoals, by three members of the Hawaiian Islands National Wildlife Refuge staff (Debra Henry, Service, pers. comm. 2002).

On January 26, 2004, a NOAA Fisheries observer aboard a California-based longline vessel targeting swordfish had a sighting of a possible short-tailed albatross at 32º 27' N latitude, 150º 43' W longitude, well within the area where albatross mortality has been documented in association with the Hawaii-based longline fishery. At the time of the sighting, the weather was calm and the vessel was retrieving its longline gear. The albatross was about 30 ft (10 m) from the vessel and gear. No observed interaction occurred. The observer took notes on the bird's appearance and took photographs. On March 22, the identification was confirmed to be a short-tailed albatross by Service personnel in Honolulu (E. Flint and H. Freifeld, pers. comm. 2004).

On April 22, 2004, one subadult short-tailed albatross was observed flying over the water within one mile of Southeast Islet at Pearl and Hermes Reef. A Service biologist made the observation while en route to the islet from the NOAA vessel *Oscar Sette* (C. Depkin, Service, pers. comm., 2004).

Foraging Behavior and Surrogate Species

Short-tailed, black-footed, and Laysan albatrosses range over the entire North Pacific Ocean (Sanger 1974a, 1974b), however, there are regions where albatrosses are more commonly observed. These regions are associated with breeding colonies and highly productive waters of the Bering Sea and Gulf of Alaska, as well as the North Pacific Transition Zone and along the western coast of North America. Black-footed and Laysan albatrosses nesting in the Northwestern Hawaiian Islands forage predominantly north and northeast of the Hawaiian Archipelago, flying as far as Alaska or the western coast of the contiguous U.S. (Fernandez *et al.* 2001, Hyrenbach *et al.* 2002). Differences in distribution at sea might also be explained, in part, by variations in foraging behaviors and preferred prey. It is reasonable to assume that seabirds are migrating to regions of high productivity to forage regardless of their preferred food. These same areas of high productivity also attract longline fishing operations (Seki *et al.* 1999).

Because of the rarity of some endangered species, surrogate species may be used to assess the effect of the proposed action (Service and NOAA Fisheries Endangered Species Consultation Handbook, p. 4-47). Albatrosses are vulnerable in the North Pacific to longline fishing wherever they co-occur. Because Laysan, black-footed, and short-tailed albatrosses exhibit similar feeding behavior at sea and have been documented to be killed in other U.S. fisheries, Laysan and black-footed albatrosses are appropriate surrogates to assess the effects of the proposed action on the endangered short-tailed albatross. The approximate area in which Laysan and black-footed albatross interact with Hawaii-based longline vessels is illustrated in Figure 8, and the area where the Hawaii-based longline fishery overlaps with the range of the short-tailed albatross is illustrated in Figure 7. These maps indicate that interactions between Laysan and black-footed albatross species and the Hawaii-based longline vessels occurs within the range of the short-tailed albatross. These actions have resulted in mortality of Laysan and black-footed albatrosses (See Hooks Set per Unit Time and Trip Type section, below).

Similar to Laysan and black-footed albatross, short-tailed albatross are able to locate food using well-developed eyesight and sense of smell. All three species of albatross feed at the ocean surface or within the upper 3 ft (1 m) by seizing, dipping or scavenging (Austin 1949, Harrison *et al.* 1983). Their diet consists primarily of squid, fish, flying fish eggs, shrimp, and other crustaceans (Hattori in Austin 1949, H. Hasegawa, pers. comm., 1997).

As demonstrated in the Alaska fishery, short-tailed, Laysan and black-footed albatross have been documented by NOAA Fisheries to be killed as a result of interaction with demersal longline gear (Shannon Fitzgerald, NOAA Fisheries, pers. comm. 2000). Birds attempting to steal bait may be hooked, pulled underwater as the mainline is set at its fishing depth, and drowned. In a similar manner, birds may also be killed during haulback operations. Also, if birds that attempt to steal bait are not hooked, they may be injured during the process of attempting to steal bait either from the hook, branch line, or mainline.

In February 1999, fishery scientists aboard the *R/V Townsend-Cromwell* conducted a study to test the effectiveness of several techniques to reduce seabird interaction with swordfish longline fishing gear. A portion of the experiment was conducted within 50 nautical miles (nm) (91.45 km) of French Frigate Shoals, a breeding colony for black-footed and Laysan albatross and where at least two different short-tailed albatross have been observed. The experiment was also conducted in close proximity to Laysan Island where Laysan and black-footed albatross occur. Normally, longline fishing vessels are prohibited from entering waters closer than 50 nautical miles (91.45 km) from the islands and atolls that comprise the Northwestern Hawaiian Islands to avoid interaction with marine mammals. However the risk to seabirds and other protected species was considered negligible, because this was an experiment to test the effectiveness of certain seabird deterrent devices. Also, large safety pins were substituted for hooks to hold the

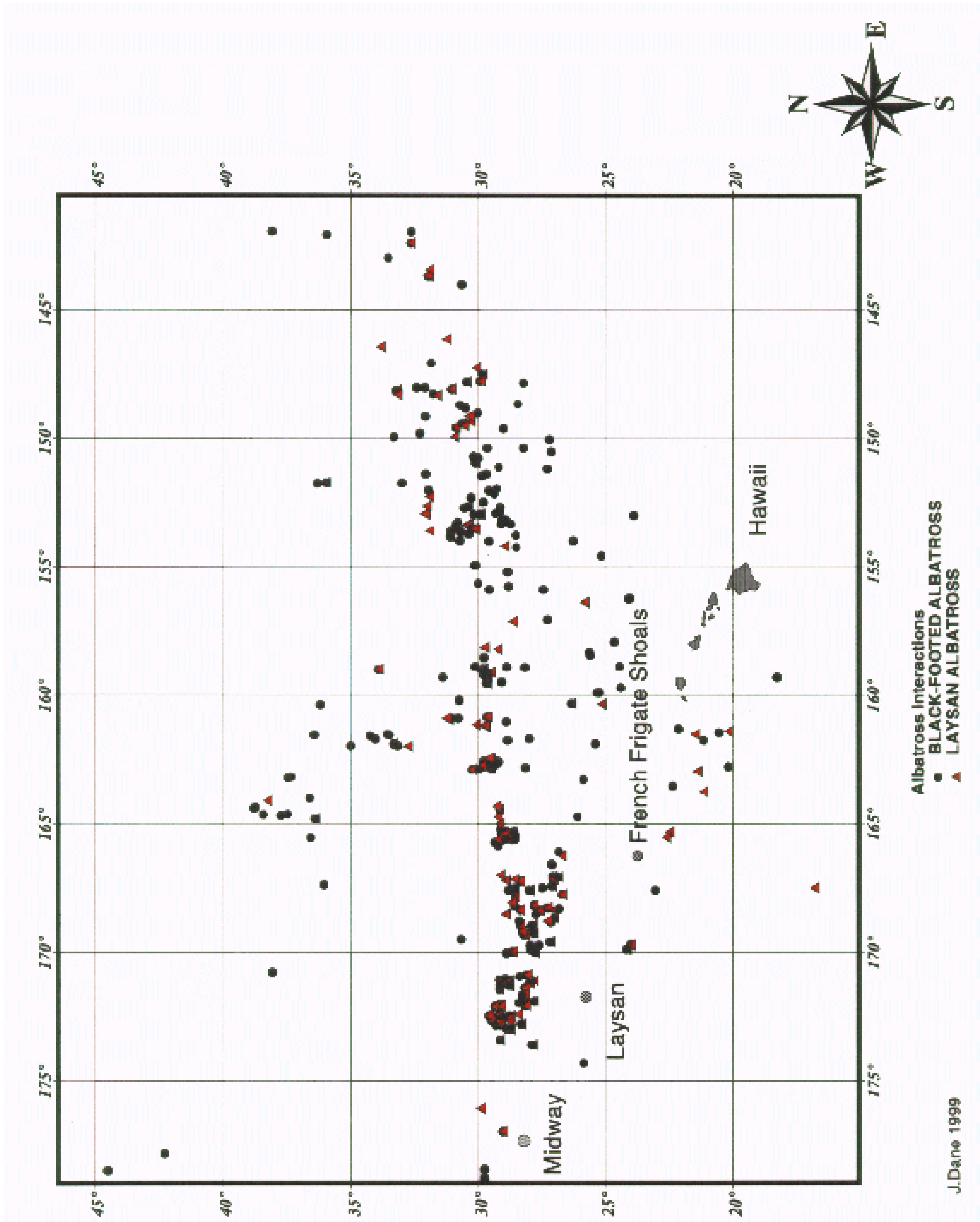

Figure 8. General distribution of albatross interactions with the Hawaii-based longline fishery (NOAA Fisheries unpublished data 1999).

bait (squid - *Illex* spp.) on the line, thereby significantly reducing potential impacts to seabirds. There were no reported impacts to protected species during this experiment. Data from 24 experimental sets indicate that researchers made 5,143 observations of black-footed albatross and 5,178 observations of Laysan albatross, among other seabird species, trailing the vessel during the study (Boggs 2001). Observations of seabirds were recorded as far back as 980 ft (327 m) from the stern of the vessel. Observers spent approximately 100 hours documenting seabird observations as part of the study, but did not observe any short-tailed albatross. No species of seabirds other than black-footed and Laysan albatross were observed to have interacted with the longline baits or gear.

<u>Hooks Set per Unit Time and Trip Type</u>

NOAA Fisheries has documented the take of Laysan and black-footed albatross since 1994 through its Hawaii longline observer program. "Take" typically means any interaction between a seabird and fishing gear or operations, and is usually interpreted as a bird being entangled in gear or hooked, which typically leads to death or injury. The documentation of observed take, and the data from which fleet-wide estimated have been made, has consisted largely of dead or injured birds brought up on hooks, and does not include the unknown number of injured birds that go undetected because they free themselves from fishing gear. The mortality rate of these injured birds, along with the birds documented as "released injured" by fishery observers, is unknown. The methodology used to estimate the total number of birds taken, with 95% confidence intervals, is described in the Southwest Fisheries Science Center Administrative Report H-01-03 (McCracken 2001).

It must be noted here that the rate at which albatrosses are killed in the Hawaii-based fishery appears to have changed significantly over the past several years (NOAA Fisheries 2003a, 2003b). The most significant source of change was the court-ordered closure of the swordfish sector of the fishery in 2001. This temporary closure resulted in a decrease in the number of albatrosses observed to be taken in the fishery. For example, in 2000, when approximately 3,408 shallow sets and 9,525 deep sets were conducted (without seabird deterrents; D. Kobayashi, NOAA Fisheries, pers. comm, 2004), fisheries observers recorded a total of 185 albatrosses killed and 58 injured, while in 2002, 296 shallow sets (conducted despite the closure of the swordfish fishery) and 13,816 deep sets were conducted with a higher rate of observer coverage, and observers recorded 29 dead and 3 injured albatrosses. However, shallow-set effort in the Hawaii-based longline fishery decreased steadily after 1999 (D. Kobayashi, pers. comm, 2004). Because of this decrease in the rate of shallow-set effort since 1999, we evaluate the effect of the proposed action, the reopening of the shallow-set or swordfish-target fishery, against conditions in the fishery prior to 2000.

For Laysan and black-footed albatross, Table 6 summarizes the annual (1994 - 1999) estimated rate at which birds were taken per 1,000 hooks, the fishery-wide take estimate and the 95% confidence intervals (McCracken 2001), and the total number of hooks set in the entire Hawaii-based longline fishery (*e.g.*, swordfish trips, mixed trips and tuna trips combined) (WPRFMC 1999; NOAA Fisheries unpublished data, 2004). Table 6 represents the conservative, or low, end of the range of birds that were taken per 1,000 hooks in the Hawaiian longline fishery.

Actual rates at which seabirds interact with Hawaii-based longline gear may be higher. It must be noted that between 30% to 95% of birds caught on the fishing gear during deployment and haulback may not be observed because they fall off the hook as a result of gear deployment/haulback operations or strong currents, they may be scavenged by predators during the soak, or they may be cut off by fishers during the haulback (Gales *et al.* 1998, Brian McNamara, pers. comm. 2000, Gilman *et al.*, 2003a, 2003b).

Table 6. Seabird take estimates for Hawaii-based longline fishery, 1994-1999 (estimate of birds per thousand hooks based on total hooks set in fishery). Sources: Estimate of birds per 1000 hooks calculated by Holly Freifeld, Service (July 2004; Estimated total takes/total hooks set in fishery x 1,000). Estimated total takes and 95% confidence interval calculated by Marti McCracken (2001). Total hooks set in fishery provided by Alvin Katekaru and Chris Boggs, NOAA Fisheries (pers. comm., 1999), and by Tom Swenarton, NOAA Fisheries (pers. comm. 2004).

Laysan Albatross						
	1994	1995	1996	1997	1998	1999
Estimate of birds per 1000 hooks	0.1826	0.0596	0.0816	0.0633	0.0565	0.0529
Reported kills	73	107	31	66	56	71
Estimated total kills	2,067	844	1,154	985	981	1,019
95% confidence interval	1,422 - 2,948	617 - 1,131	835 - 1,600	715 - 1,364	679 - 1,360	688 - 1,435
Total hooks set in fishery	11,319,023	14,155,169	14,141,256	15,564,321	17,365,852	19,245,593
Black-footed Albatross						
	1994	1995	1996	1997	1998	1999
Estimate of birds per 1000 hooks	0.1617	0.0801	0.1041	0.0838	0.739	0.676
Reported kills	126	105	59	107	46	70
Estimated total kills	1,830	1,134	1,472	1,305	1,283	1,301
95% confidence interval	1,457 - 2,239	899 - 1,376	1,199 - 1,811	1,077 - 1,592	1,028 - 1,601	1,021 - 1,600
Total hooks set in fishery	11,319,023	14,155,169	14,141,256	15,564,321	17,365,852	19,245,593

This information can be further refined by reporting bycatch ratios by set type (Table 7), based on information from the NOAA Fisheries observer database (1994 - 1998). When fishers targeted swordfish, about 370 birds were observed caught after 488 observed sets which results in a 0.758 bird catch per set ratio. When fishers targeted both tuna and swordfish, known as a mixed set, about 472 birds were caught after 946 observed sets which results in a 0.499 bird catch per set ratio. When fishers targeted tuna, about 16 birds were observed caught after 1,250 observed sets which results in a 0.01 bird catch per set ratio. Clearly, when fishers conducted swordfish or mixed sets, they experienced a higher bird catch ratio which is attributed to the methodology employed and/or the geographic area where this type of fishing took place. However, it is evident that the risk of interaction persists when fishers target tuna, albeit at a much reduced rate.[1]

Table 7. Incidental catch of albatrosses in the Hawaii longline fishery by set type (NMFS Observer Records 1994 – 1998; Source: C. Karnella, NOAA Fisheries, pers. comm., 2000)

Targeted Fish During Set Type	Observed Bird Catch	Number of Observed Sets	Bird Catch/Set
Swordfish	370	488	0.758
Mixed	472	946	0.499
Tuna	16	1,250	0.013

Seabird Deterrent Measures

The terms and conditions in the November 2000 Biological Opinion included minor modifications of seabird deterrent measures already implemented in the Hawaii-based longline fishery for both deep-set and shallow-set fishing. These modifications were effected in the November 2000 Opinion to ensure that a) seabird deterrent strategies would be implemented in areas where the short-tailed albatross foraging range may overlap with the fishery; b) the performance of seabird deterrent strategies would be measurable, thus providing the Service and NOAA Fisheries with information to refine and improve upon seabird deterrent measures in the future; and c) the implementation of seabird deterrent strategies was consistent with recommendations from enforcement officers.

Review of the observations of short-tailed albatrosses in Hawaii (above) demonstrates that NOAA Fisheries' proposal in 1999 to require seabird deterrent measures for all Hawaii-based longline vessels operating north of 25º north latitude did not adequately cover areas where the short-tailed albatross may occur. This species has been observed at French Frigate Shoals and as

[1] It is important to note here that vessels setting deep and targeting tuna may have higher levels of incidental catch of albatrosses when fishing in areas with high concentrations of birds, *e.g.*, in relative proximity to the Northwestern Hawaiian Islands. This event has been observed anecdotally (N. Brothers, Marine Ecology and Technology Consultant, pers. comm. 2003).

far south as Kauai. Furthermore, the foraging range of individual short-tailed albatrosses that visit Midway Atoll National Wildlife Refuge each year is unknown.

Because the swordfish sector of the Hawaii-based fishery was closed in March 2001, the seabird deterrents required in the terms and conditions of the November 2000 Opinion to reduce the risk of incidental take in swordfish-target longline fishing (thawed, blue-dyed bait, strategic offal discharge, and night setting), were implemented for insufficient time to evaluate their performance in shallow-set longline operations (NOAA Fisheries 2003a, 2003b). Therefore, our current assessment of the effectiveness of the measures required in the November 2000 Opinion is based solely on several studies conducted in Hawaii that were designed to test various seabird deterrents (Garcia *et al.* 1999, Boggs 2001, Gilman *et al.* 2002, 2003b), and one study designed to examine various gear configurations to reduce incidental take of sea turtles in shallow sets (Boggs 2002), rather than on monitoring data from the commercial fishery.

These studies remain the best available scientific information at this time regarding deterrence of seabird interactions, injuries, and mortalities associated with the Hawaii-based longline fishery. These reports supported reasonable measures that the fishery should implement to reduce the potential interaction between the fishing gear and the short-tailed albatross. In the original short-tailed albatross consultation, which relied heavily upon the Garcia and Associates (1999) study and the preliminary report from Boggs' 1999 study, the Service concurred with NOAA Fisheries that "night setting, blue-dyed and thawed bait, towed deterrent, weighted branch lines, line-setting machine and weighted branch lines, and discharge offal strategically" are, to various degrees, successful in reducing interaction and mortalities between longline gear and seabirds.

In 2002 and 2003, a consortium of parties led by National Audubon Society conducted experiments to test the effectiveness of two seabird deterrents new to Hawaii (Gilman *et al.* 2003a, 2003b). These deterrents are an underwater line-setting chute (a metal sleeve for deploying baited branch lines from the setting machine to several meters beneath the sea surface), and side setting (deploying gear from the side of the vessel instead of the stern, effectively using the vessel itself as an obstacle to albatrosses). The results of these experiments suggested that both of these methods when properly implemented are as effective as or more effective than the deterrents currently required in the fishery. Although the underwater chute effectively prevents seabirds from having access to baited hooks during gear deployment, it is still a custom-made item that is not widely available, and in trials presented several operational drawbacks that at present make it a less-than-optimal deterrent for use in the Hawaii-based longline fishery. Side setting, in contrast, was found to be highly effective, operationally simple, and popular with fishers (Gilman *et al.* 2003a). Several vessels in the fishery have voluntarily implemented side setting to reduce seabird bycatch, increase bait retention, and reduce operational burden by shifting the setting of gear to the same point on the boat where the gear is hauled in (K. Gore, pers. comm., 2004).

Night setting now is included in the proposed action as a required seabird deterrent for shallow-setting vessels fishing north of 23ºN (69 FR 17329). For the purpose of including a variable to express effectiveness of this deterrent in our calculation of incidental take, we evaluated the only two studies that have tested night setting in Hawaii: those of Garcia and Associates (1999) and Boggs (2002). In both of these studies, night setting was conducted using thawed, blue-dyed squid bait; Boggs (2002) also conducted night setting without blue dye. The mean effectiveness (rate of reduction in albatross take compared with a control) of night setting combined with blue-dyed squid documented by Garcia and Associates (1999) was 73 percent. In Boggs' (2002) study, the mean effectiveness of night setting by itself was reported as 83 to 84 percent, and the effectiveness of night setting combined with blue-dyed squid was 98 to 99 percent. These means, however, do not express the considerable variation observed in the rate of albatross contacts with bait during night setting.

Because the use of night setting as a seabird deterrent is predicated on albatross being unable to see the bait, the presence of natural or artificial light and the use of light sticks are important sources of variation in the effectiveness of this deterrent (and use of light sticks is permitted in the proposed action). Rates of albatross take during night setting in the Garcia and Associates (1999) study varied with moon phase, cloud cover, and vessel lighting, all of which affected the birds' ability to see the baited hooks in the water (B. McNamara, pers. comm., 2004). In Boggs' (2002) study, each of the three experimental trips took place over a wide range of moon phases, and presumably cloud cover varied also. These and possibly other factors are reflected in highly variable rates of albatross contacts per set, as illustrated by the large confidence intervals around the calculated mean contact rates for each treatment and the control in Boggs' (2002) study (Fig. 9). Shallow setting at night, however, clearly resulted in lower contact rates than deep setting during the day.

Only mackerel-type bait will be used in the proposed action; the use of squid bait is not permitted in the reopened Hawaii-based swordfish fishery. The observed effectiveness of night setting combined with blue-dyed squid bait, as in the Garcia and Associates (1999) study and Treatment 2 in Figure 9, thus is not applicable here. The effectiveness of dying fin-fish bait is uncertain (*e.g.*, Gilman *et al.* 2003b), although the proposed action does include dyeing bait blue as well as thawing it. Scaly fish skin is thought to not hold dye as well as squid; the older the bait is, the more likely the scales are to fall off (G. Lydon, pers. comm., 2004); and the scales of fish bait may remain a shiny attractant for seabirds even when dyed blue, even at night. Scant data exist from Hawaii on the effectiveness of dyeing fish bait blue, and those data yield conflicting results: Garcia and Associates (1999) showed that it was an effective deterrent, and Gilman *et al.* (2003b), suggest that it was not. A pilot study in New Zealand only tested dyeing procedures on fin-fish baits; the seabird deterrent effect of blue-dyed fish baits has not been tested at sea there (G. Lydon, pers. comm., 2004). More information still is needed to assess the effectiveness of blue-dyed fish bait in the Hawaii-based longline fishery.

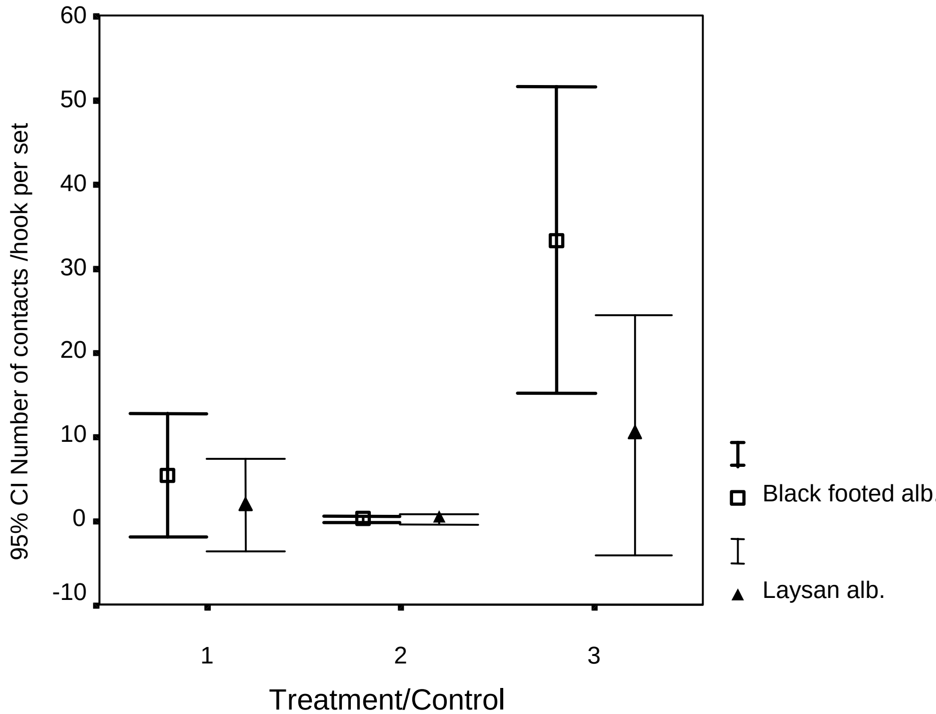

Figure 9. Number of contacts with hooks per set (confidence interval around mean): 1 = Shallow night setting; 2 = Shallow night setting with blue-dyed squid; 3 = Deep daytime setting (control). Adapted from Boggs 2002.

Observer Coverage

NOAA Fisheries observers have been deployed aboard industry fishing vessels since 1994 to collect fishery-related information and to record sightings of sea turtles, seabirds, marine mammals, billfish, sharks, and tunas (NOAA Fisheries 2004b). The rate of observer coverage has changed over time (see below). The proposed action includes observer coverage on all shallow-set Hawaii-based longline vessels. The Service has provided training in seabird identification for NOAA Fisheries observers on numerous occasions since the mandatory observer program started. Observers are currently instructed to record interactions ofseabirds with the fishing gear as well as conduct brief scan-counts and identification of seabirds at the top of each hour during haulbacks. (NOAA Fisheries defines interaction to be contact with the gear including leaders trailing off the stern of the vessel within 300 ft (100 m) of the boat. Evidence of this contact includes observations of animals at the gear; animals stealing fish from the gear or coming in contact with the gear; and evidence of fresh marine mammal or seabird damage to the catch (not by presence of damaged fish only). Sightings of short-tailed albatross are a high priority, and observers are instructed to record details of all sightings and try to photograph any short-tailed albatross sighted. Because observers have not historically allotted a portion of their time to seabird observations, and because short-tailed albatrosses are rare, the probability is remote that a short-tailed albatross would be observed through casual observation. Observers are instructed when fishing north of 23ºN to observe the setting of the longline gear until seabirds are no longer present or, in the case of night sets, until the difference between seabird species can no longer be distinguished. Also, during the haulback observers are instructed to record seabird sightings and behavior in the vicinity of the fishing gear being retrieved. In order to focus on seabird observations, when seabirds are in the area observers are asked to not record fish life history data (Circular Update, No. 55, 2002).

Between 1994 and 1996, observers had three options for describing deterrents that might be used by fishermen to keep birds away from fishing gear. Observers could record "yes" or "no" under "streamer," "bomb," or "other." They then were asked to describe the use of this deterrent and the results in the narrative section of their data form. In 1997, the data form was amended to include 12 different bird-catch reduction devices and techniques that could be checked off. In 2002, the data form was amended again to include a checklist of 14 different deterrent methods and techniques that could be checked off for use during the set, and a checklist of nine mitigation methods that may have been used during the haulback. The form also includes a space for recording how much of the set was observed as well as room for comments regarding the set and the haulback. Along with interaction and deterrent data, observers collect a suite of other information about environmental conditions, time, type of gear, technique, and location of fishing effort, which could be related to levels of bird catch. These procedures will be followed in the proposed action (K. Gore, pers. comm., 2004).

On November 17, 1998, a new instruction was issued for observers to collect and return to port any short-tailed albatross retrieved dead during longline fishing operations (NOAA Fisheries 2004b). The same memorandum asked that any seabirds that are retrieved alive have any line and hook removed if possible, be described and the characteristics recorded, have their leg band data recorded, be photographed, and released. These procedures will continue to be followed in the proposed action.

In addition, NOAA Fisheries has created a new form to report biological information about seabirds that are incidentally caught during longline fishing operations. This form includes information on placement of the hooking, how the gear was removed, morphology of the seabird, date, time, and latitude and longitude of the capture and release. In addition, observers are now instructed to retain any dead albatross for return to Honolulu. If freezer space is inadequate, only the short-tailed albatross will be retained.

There was an annual average of 1,078 longline trips during the period 1994 - 1999, and an annual average of 46 observed fishing trips, or 4.3% (NOAA Fisheries Observer Program, unpubl. data). NOAA Fisheries observers work about 10 hours per day, and reserve enough time to observe about 10% of each set during tuna trips and 3% of each set (gear deployment) during swordfish trips (Lewis Van Fossen, NOAA Fisheries, pers. comm., 1999). The peak period when seabirds interact with longline gear is during the set, although some interaction does occur during the haulback (Garcia and Associates 1999). This is especially true of swordfish-target fishing, in which the haulback typically occurs in daylight, and the strong smell of swordfish draws birds to the boat. Birds hooked during the haulback are more likely to be alive when they reach the deck of the vessel, and if proper handling procedures are followed, these birds have a chance of survival. Historically (since the inception of the observer program in 1994), very little observer time has been dedicated to looking for short-tailed albatross during the set, when seabirds are most likely to interact with longline fishing gear.

As described in the Description of the Proposed Action section, observer coverage in the reopened swordfish fishery will be 100%, that is, all vessels leaving port on shallow-set trips will carry a NOAA Fisheries observer. The tuna fishery has operated since 2001 with a court-ordered minimum of 20% observer coverage, and with at least 5% of all trips north of 23ºN carrying an observer, under the terms and conditions of the November 2002 Opinion, which still is in effect for the tuna fishery.

B. Analyses for Effects of the Action

The expected adverse effect of the proposed action is injury and/or mortality or injury of short-tailed albatrosses. Birds attempting to feed on bait may be hooked, pulled underwater as the mainline is set, and drowned. Birds also may sustain injuries from interactions with baited hooks during the process of setting and hauling back the main line, which could seriously impair them and result in mortality. Injured birds may not be detected or recorded as such; for example, an entangled or lightly hooked bird may free itself and leave the area.

The Service has considered different approaches to estimating the number of birds taken by the Hawaiian longline fishing fleet. In this section we explain how we estimate incidental take of short-tailed albatross expected as a result of the proposed action.

We have determined that short-tailed albatrosses are at risk of injury or mortality from Hawaii longline fishing operations based on the following data points: 1) documented take of Laysan and black-footed albatrosses in the fishery combined with the similarities in foraging behaviors and distributions of Laysan and black-footed albatrosses and the short-tailed albatross, 2) observation of a short-tailed albatross "actively looking for bait on hooks in haulback" behind the NOAA *R/V Townsend-Cromwell* in 1997, which supported the need for formal section 7 consultation, 3) the disappearance of "white 000" in 1994 and the possibility of mortality related to the Hawaii-based longline fishery, and 4) repeated sightings of numerous individuals over several months each year in the Northwestern Hawaiian Islands, especially Midway Atoll, that is, within the area of the shallow-set sector of the Hawaii-based longline fishery.

There are no documented instances of short-tailed albatrosses taken in the Hawaii-based fishery, probably because of a combination of factors, including low observer coverage in the fishery (1994 - 1999 average coverage: less than 5%), the allocation of observers' duties during that period, and the fact that short-tailed albatross occurrences are likely to be relatively rare because of their low population numbers worldwide.

The absence of observed and documented takes of this species in the fishery complicates our attempts to estimate the amount of take likely to occur as a result of the action. Historical information is lacking on which to base an estimate of take in the Hawaii-based fishery. Therefore, based on the similarities in foraging behavior between short-tailed, Laysan and black-footed albatross, we considered using the hooking rate of Laysan and/or black-footed albatrosses to estimate the total annual take of short-tailed albatrosses. Although crude, this represents the best available information on the number of short-tailed albatrosses likely to be taken in this fishery until such time that observer coverage of short-tailed albatross interaction with the fishery operations is increased.

Few short-tailed albatrosses exist today and even fewer have been observed in the vicinity of Hawaii. The level of risk this species experiences as a result of Hawaii-based longline fishing activities is difficult to determine because of its apparently low occurrence at fishing grounds frequented by the Hawaii-based longline fleet. Because of the rarity of the short-tailed albatross, surrogate species may be used to assess the effect of the action (Section 7 Consultation Handbook, p. 4-47). Our knowledge of the foraging behavior of the three species of *Phoebastria* albatross that occur in the North Pacific (which includes the action area), and the existing data collected in various studies of seabird deterrents suggest that (1) these species behave similarly with respect to longline fishing, and (2) a deterrent that is effective for one species is likely to be effective for all three. The use of specific data on the behaviors and mortality of Laysan and black-footed albatross, then, is a practical and sound method of assessing and monitoring risk of take and the use of measures to minimize take of short-tailed albatross.

The following approach for estimating incidental take indicates that we can expect 1 (one) short-tailed albatross per year to be taken in the shallow-set component of the Hawaii-based longline fishery. Based on Southwest Fisheries Science Center Administrative Report H-01-03, "Estimation of Albatross Take in Hawaiian Longline Fisheries" (McCracken 2001) and unpublished data from NOAA Fisheries (K. Busscher and T. Swenarton, pers. comm., 2004), we can calculate the number of birds (Laysan and black-footed albatross) per 1,000 hooks that were killed in the Hawaii-based longline fishery prior to the reduction and closure of the swordfish fishery. We acknowledge that those rates are not directly comparable to the entire population of short-tailed albatross because of species differences, including breeding colony location and the resultant difference in distribution; however, they provide the best basis for estimating incidental take of short-tailed albatross in the vicinity of the Hawaiian Islands.

Laysan and black-footed albatross appear in this area in greater numbers than short-tailed albatrosses because their worldwide population numbers are significantly higher, and because the primary breeding colonies for these two species are within the boundaries of the Hawaiian Islands National Wildlife Refuge. The primary breeding colony for short-tailed albatross is in Japan. Because of the differences in geographic locations of these breeding colonies, we would not expect to see the worldwide population of short-tailed albatross affected by the proposed action in exactly the same manner as the worldwide population of Laysan or black-footed albatross.[2] However, because there are longline fishery-causeed mortalities of Laysan and black-footed albatross in the vicinity of the Hawaiian Islands National Wildlife Refuge, and because short-tailed albatross have been sighted in this vicinity, a small percentage of the world-wide population of short-tailed albatross may be adversely affected (taken).

A percentage of the short-tailed albatross (subadult and adult) population traverses the area where the Hawaii-based longline fishery operates. A percentage of these birds may be killed or injured as a result of the fishery's operation. Between 1938 and 2004, at least 17 different individuals were observed about 50 times (observations range from flyovers to part-time residents), with most of the observations from land. The first recorded at-sea observation of a short-tailed albatross in the vicinity of the Northwestern Hawaiian Islands was from the *R/V Townsend-Cromwell* in 1997. This observation was made by a fishery biologist who was trained in seabird identification. This was the first time a biologist, trained in seabird identification, served aboard a vessel to observe seabird behavior within the area where this fishery operates.

Short-tailed albatross range from Torishima in the western Pacific as far away as the Bering Sea, the Aleutian Islands and southern Alaska, the west coast of North America, and Hawaii. We acknowledge that the occurrence of short-tailed albatross in the Pacific is not necessarily evenly or randomly distributed throughout the species' range. However, absent specific data, we can use the generalized overlap of the range of the short-tailed albatross with the area in which the fishery operates to derive a coarse estimate of the proportion of the short-tailed albatross population which may be vulnerable to Hawaii-based longline fishing activities.

The distribution of the short-tailed albatross is approximately 4,040,441,000 hectares (Fig. 6). Because most observations of short-tailed albatross beyond the Torishima breeding colony occur in the vicinity of the coastal waters of the North American continent, an "oceanic flyway" may exist between the breeding colony and North America. Based on Service and NOAA Fisheries observations of short-tailed albatross, the Service suspects that the Northwestern Hawaiian Islands are a part of this "flyway" for birds that transit to and from the North American foraging grounds. The Service can only estimate the percentage of the total short-tailed albatross population that may transit through this general area, and generate a coarse but functional estimate of take that may occur annually in this fishery.

The generalized area in which longline vessels registered in Hawaii operate and overlap with the range of the short-tailed albatross (Fig. 7) is approximately 989,651,000 hectares or 24.5% of the range of the bird. We consider the generalized area to suffice because the geographic distribution of swordfish- and tuna-target fishing in the Hawaii-based fishery have largely overlapped historically, although some tuna sets occur south of the southern limit of swordfish fishing, and some swordfish sets occur east and north of the eastern limit of tuna fishing.

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[2] Japan also harbors several small colonies of the black-footed albatross. Bands taken from black-footed albatrosses caught in the Hawaii-based longline fishery indicate that Japanese black-footed albatrosses forage in and transit the area where this fishery operates and for pelagic seabirds breeding in Japan to occur in the vicinity of Hawaii is not an anomaly (E. Flint, pers. comm., 2004).

We estimate that throughout the course of one year, about 488 (or 24.5% of the estimated 1,990 of the worldwide population; Sievert 2004) short-tailed albatross may be present within the area where the range of the bird overlaps with the Hawaii-based longline fishery (Fig. 7). We can estimate the number of birds that may be taken as a result of the Hawaii-based longline fishery by comparing the number of short-tailed albatross that may appear in the vicinity of the Hawaii-based longline fishing area with the estimated proportion of black-footed albatross that are killed by the fishery in this same area. We choose to compare the short-tailed albatross with black-footed albatross because both species are larger than the Laysan albatross and may outcompete Laysan albatrosses for food due to their size and behavior. Furthermore, the NOAA Fisheries observations of short-tailed albatrosses (March 1997 and February 2000) indicate that they were flying by primarily in the company of black-footed albatrosses. In March 1997 a juvenile short-tailed albatross was observed in the company of about 30 black-footed albatrosses by a NOAA Fisheries biologist from the *R/V Townsend-Cromwell*; in February, 2000 a juvenile short-tailed albatross was observed in the company of about 10 - 15 black-footed albatrosses by a NOAA Fisheries observer from a Hawaii-based longline fishing vessel.

NOAA Fisheries estimated that 6,681 - 10,219 black-footed albatrosses (sum of upper and lower 95% prediction intervals calculated for data collected by fisheries observers) were taken by Hawaii-based longliners fishing for both tuna and swordfish between 1994 and 1999 (McCracken 2001). The average annual rate of mortality predicted for the black-footed albatross, in proportion to its population size, and an adjustment for the resumption of shallow-set longlining at the level of 2,120 sets per year, with night setting required, are used as proxy variables for determining the risk of incidental take for the rare short-tailed albatross. Shallow-set longlining was calculated to account for approximately 60% of the estimated take of albatrosses in the fishery (November 2000 Opinion, p. 37).

The estimated number of black-footed albatrosses worldwide was about 277,675 in 1999, and was assumed to be roughly similar when incidental take of the short-tailed albatross was calculated for the November 2000 Biological Opinion. This estimate was based on calculations and assumptions (including survivorship and reproductive success) in Cousins and Cooper (2000). Using these methods and assumptions, we determined that there were approximately 138,963 breeders and about 138,712 non-breeders in the population. This estimate is based on the proportion of the black-footed albatross world population (95%) that was counted in 1999. We use the 1999 population estimate and calculation of the rate of interactions[3] of black-footed albatrosses with Hawaii-based longline fishery operations because this rate also uses observed and fleet-wide estimates of take from 1994 to 1999. Subsequent to 1999, swordfish effort decreased significantly.

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[3] NOAA Fisheries uses the term "take" to describe "an interaction between a seabird and anything related to the activity of fishing, and it usually implies that the seabird became entangled in the line or was caught on a hook" (McCracken 2001). Because "take" has a specific meaning with respect to listed species, we use the term "interaction" to refer to entanglement or hooking of (non-listed) black-footed and Laysan albatrosses, and reserve the term "take" for use in reference to the short-tailed albatross. We maintain that such interactions between albatrosses and longline fisheries, especially during the set, typically result in albatross mortality.

The model used in the November 2000 Opinion and the November 2002 revised Opinion to estimate take of short-tailed albatrosses by the commercial longline fishery is presented below and updated to reflect the fishery operation as described in the proposed action and other new information. Because take of short-tailed albatrosses has not yet been observed and reported in the Hawaii-based fishery, the model hypothesizes an annual short-tailed albatross take based on the average 1994 - 1999 annual rate of black-footed albatross interactions, and assumes that the Hawaii fishery affects only the fraction of the short-tailed albatross population that is present within the range of the Hawaii-based fishery. The model used the following variables:

Fishery take (M) = 0.0082/year	Rate based on the 6-year (1994 - 1999) average of the estimated annual mortality of black-footed albatrosses by the Hawaii-based longline fishery operating without seabird deterrents (= 1,388 birds), adjusted by a fall-off or removal rate of 31%[4] (= 1,860), divided by the estimated black-footed albatross population size in 1999 (= 227,675 birds).

If this take proportion is applied to the estimated current world population of 1,990 short-tailed albatrosses, we would estimate that about 16 would be taken each year by the Hawaii-based longline fleet under similar conditions. However, we scaled the exposure of the short-tailed albatross population to the geographic area where their range and the operation of the fishery overlap.

At-risk area (A) = 0.245	Fraction of the short-tailed albatross range that overlaps with the Hawaii-based longline fishery (November 2000 Opinion, p. 40).
Population (N) = 1,990 birds	Most recent population estimate for the short-tailed albatross (Sievert 2004).

The estimated take (T) of short-tailed albatrosses in the Hawaii-based fishery based on historical levels of fishing effort and albatross take, scaled to the area of overlap between the species' range and the fishery, and updated with the current short-tailed albatross population estimate is calculated as:

T = M x A x N, or

[4] In the 2002 revised Opinion, we adjusted (M) to reflect new data on the fall-off or removal (by sharks or other scavengers) of hooked birds prior the haul. Studies of fall-off in other regions were cited in the November 2000 Opinion, but none had been conducted in the Hawaii-based fishery, and no variable reflecting this fall-off was included in the calculation of incidental take of short- tailed albatrosses. Data on fall-off rates were collected during experiments conducted in Hawaii in 2002 and 2003 to test the efficacy of underwater line chutes and side setting as seabird deterrents. Gilman *et al.* (2002, 2003b) found that 34% and 28% of birds observed to be hooked during the set in 2002 and 2003, respectively, were not found on the line when the gear was hauled in. For the purpose of calculating incidental take in this Biological Opinion, we have taken the average of these two results, and assumed a fall-off rate of 31%.

T = 3.99 or 4 short-tailed albatrosses per year.

To use this model to estimate short-tailed albatross take under the new proposed action, which limits the total number of shallow sets to 2,120 per year in the Hawaii-based longline fishery, we next scaled the extent of the proposed action (E) to account for the change in shallow sets relative to historical levels of shallow sets. This historic level was determined by NOAA Fisheries by combining sets logged as swordfish-target sets, and sets logged as "mixed" sets that were determined to be shallow sets either because they had fewer than 10 branch lines per float or had light sticks (D. Kobayashi, NOAA Fisheries, pers. comm., 2004). The annual average number of shallow sets between 1994 and 1999 was 4,243.

Extent of the proposed action (E) = 0.5	The calculated change in shallow set effort in the proposed action when compared with the 1994-99 annual average, or 4,243/2,120

Therefore, our estimation of take (T) of short-tailed albatrosses in the Hawaii-based fishery, as calculated above, scaled to the extent of the proposed action is:

T = M x A x N x E, or
T = 1.995 or 2 short-tailed albatrosses per year.

Finally, we added a new variable (S) to describe the estimated effectiveness of night setting, which now is included as a required seabird deterrent in the proposed action. Because of the unsuitability of using data from night setting research that included blue-dyed bait (as described above in the Seabird Deterrent Measures section), this calculation is based on bait contact rates for black-footed albatross observed during night setting without blue-dyed bait in Boggs' (2002) study.

Although considerable variation exists in the rates of albatross contact with baited hooks during night setting (as described above in the Seabird Deterrent Measures section, and see Fig. 9), statistical complexities and time constraints prevented calculation of a numerical expression of variance around the mean contact rates reported in Boggs (2002) (C. Boggs, pers. comm., 2004). Furthermore, the reported means are for a sample size of three (3) trips, each trip value itself is a mean of the 10 or 13 sets conducted per trip (Table 8, Boggs 2002), and information about the within-trip variation in contacts per set is not available[5]. Therefore, to account for the variability suggested by the confidence intervals in Figure 9 and make the most conservative estimate of night setting effectiveness for the purpose of this biological opinion, we have examined the effect of night setting on total estimated incidental take using several values for (Ni), including the potential effect of doubling the average of the three mean contact rates (Table 9).

[5] The set-by-set data from Boggs (2002) study were not available during this consultation's timeframe (C. Boggs, pers. comm., 2004). The set-by-set data would increase the sample size from three trips to 33 sets each for night setting and daytime setting and thus provide substantially more information for evaluating the variability in albatross contact rates during night setting recorded in this study.

Night setting effectiveness (S) = Ni/D where (Ni) is 5.41, the average of three trip means of black-footed albatross contacts per set for “shallow night setting” and (D) is 33.28, the average of three trip means of contacts per set during "deep daytime setting," as reported in Boggs (2002) (Table 7). Four values for (Ni) were examined (Table 8).

Table 8. Mean contact rates per set, by trip, and averages for three trips, for deep day setting and for night setting without blue-dyed squid bait. Data from Boggs (2002).

Control/Treatment	Number of Sets	Mean Black-footed Albatross Contacts /Set	
Deep daytime setting			
Trip 1	10	36.70	
Trip 2	13	38.23	
Trip 3	10	24.90	
Average of mean contacts/set			33.28
Night setting			
Trip 1	10	5.70	
Trip 2	13	8.23	
Trip 3	10	2.30	
Average of mean contacts/set			5.41

Table 9. Calculation of night setting effectiveness (S) for the black-footed albatross using a range of alternative values based on data in Boggs (2002). These values are: the average of the three trip means of contacts per set, high mean contacts per set (Trip 2 from Table 7; Boggs 2002), and each of those values doubled to represent variability, during night setting (Ni), and the average of three trip means of contacts per set during deep daytime setting (D).

Ni	D	S= Ni/D	Calculated Estimated take	Total estimated take (rounded)
5.41 (average of means for 3 trips)	33.28	0.15	0.30	1.0
10.62 (doubled)	33.28	0.32	0.64	1.0
8.23 (highest mean – Trip 2)	33.28	0.25	0.50	1.0
16.46 (doubled)	33.28	0.50	1.0	1.0

In summary, the estimated take (T) of short-tailed albatrosses in the Hawaii-based fishery based on historical levels of fishing effort, albatross take, the extent of the current proposed action, and a conservative estimate of the effectiveness of night setting is calculated as:

T = M x A x N x E x S

We examined four possible values representing the effectiveness of night setting in reducing estimated incidental take of short-tailed albatross in the proposed action. The purpose of examining this range was to account for the apparent but unquantified variation in night setting effectiveness in Boggs' (2002) study (C. Boggs, pers. comm., 2004) and in the Garcia and Associated (1999) study (B. McNamara, pers. comm, 2004). The resulting estimated incidental take of short-tailed albatrosses in the shallow-set Hawaii-based longline fishery ranges from 0.30 to 1.0. Because these estimates are based on various assumptions, any fractional results of a quantitative estimate of incidental take should be rounded up to the next whole number. Thus, in this case, we conservatively determine that shallow-set operations of the Hawaii-based longline fishery may result in the take of 1 (one) short-tailed albatross per year in the form of mortality. Because of the current size and growth rate of the short-tailed albatross population, this level of take is determined not to jeopardize the continued existence of the species[6].

C. Species Response to the Action

In evaluating the effects of the continued operation of the longline fishery for the November 2000 Opinion, we developed a Population Viability Analysis to estimate the mortality of short-tailed albatrosses necessary to cause extinction of the species. We also considered the impact of lost future productivity of a bird to the species. We present those analyses again here. In recognition of the many limitations of PVAs and uncertainties inherent in the outputs of such models (see Reed *et al.* 1998), we present this model only for illustration, not for prediction or prescription.

<u>Population Viability Analysis</u>

In an effort to better understand the impacts of fisheries take on the short-tailed albatross population, the Service prepared a preliminary Population Viability Analysis (PVA) in 1999. PVAs are predictive models used to evaluate the effect on populations of changes in a species' environment, demography, or vital rates (Lacey 1993). Such models often are used to evaluate extinction risks and management options for rare or threatened species (Meffe and Carroll 1997). Data and general information for this analysis was obtained from Hiroshi Hasegawa (pers. comm., 2000) and from Cochrane and Starfield (1999). The PVA was done using VORTEX Version 7.2. VORTEX is produced and maintained by Robert Lacy, Department of

[6] Note that in addition to this estimate, the estimated incidental take of the short-tailed albatross in the deep-set, tuna-target sector of the fishery in November 2002 revised biological opinion is 1 (one) bird. Combining the estimated incidental take for both the deep- and shallow-set fisheries yields a total estimated incidental take of two (2) short-tailed albatrosses per year in the Hawaii-based longline fishery.

Conservation Biology, Chicago Zoological Society, Brookfield Zoo and the most recent version of the software can be obtained at no cost at internet web page: http://www.vortex9.org/vortex.html.

The PVA used the following values as the best available data on the current life-history traits of Torishima Island short-tailed albatross. The Torishima colony harbors the majority of the world short-tailed albatross population, and this colony has been closely monitored for several decades; therefore, data from the Torishima colony represent our most precise knowledge of the species. For this reason, data from the much smaller Senkaku Islands colony were not included in the model. Variances and average values for juvenile and adult mortalities, and for breeding rate of adults were obtained from Cochrane and Starfield (1999) (See output summarized in Appendices A-6, A-7, and A-8).

Age at first reproduction for males and females = 7 years
Maximum life span = 50 years
Annual fecundity = 1 egg
Initial population size = 1170 birds in a stable age distribution
Breeding rate of adults = 75% ± 10% of all adults breed each year

Baseline Adult and Juvenile Survivorship:

1. Annual Adult Survivorship = 95.5% (4.5% mortality) ± 2.0%.
2. Annual Juvenile Survivorship = 91.0% (9% mortality) ± 4.0%; note that this is for years 1-7.
3. Year 0-1 Survivorship = 56.2% (43.8% mortality) ± 5.8% This is determined from the first 6 months of survivorship from egg to fledgling and survivorship of juveniles during the first 6 months of juvenile life. Survival from egg to fledgling is determined from Hasegawa's data for years (1980-1996) without storms (See Attachment G and H; 58.9% ± 7.742%); very similar to the Cochrane and Starfield (1999) estimate of 55% average for nest success rate. Survivorship of juveniles during the first 6 months of juvenile life is the same as the baseline juvenile survivorship.

It should be noted that there are no available data on variances in the mortalities of juvenile and adult short-tailed albatross. Consequently, the comparatively low variances given above may underestimate real-world fluctuations in the size of the Torishima Island population. This underestimate may be compounded by the fact that the impacts of tropical storms or the potential eruption of the Torishima volcano are not specifically addressed in this PVA. A brief examination of Hasegawa's data indicates that storms can reduce breeding success by approximately 15%. A volcanic eruption on or near Torishima Island during the breeding season could have catastrophic effects on breeding success for that year and may also result in the death of many of the adult birds sitting on nests at the time of the eruption. These factors should be taken into consideration when evaluating the long-term dynamics of the short-tailed albatross population.

Take in fisheries has been documented in Alaska-based fisheries, and this take is a source of juvenile and adult short-tailed albatross mortality. Of the 7 observed takes in the Alaska fishery, 6 were juveniles and 1 was an adult. Fishery takes were modeled as increases in juvenile and adult mortalities. These increases were maintained at the observed 6 to 1 ratio and were modeled at five levels:

- Current mortality estimates: 9% annual juvenile mortality and 4.5% annual adult mortality;
- 11% annual juvenile mortality and 4.83% annual adult mortality;
- 13% annual juvenile mortality and 5.17% annual adult mortality;
- 15% annual juvenile mortality and 5.5% annual adult mortality;
- 17% annual juvenile mortality and 5.83% annual adult mortality.

The population size results for these varying levels of mortality are presented in Appendix A-6.

Although the PVA analysis indicates that the Torishima Island short-tailed albatross population is resilient, it is apparent from the analysis that impacts from fisheries-related mortality represent a significant hurdle to reestablishing a large population with multiple breeding sites, the historic condition of this species (see Appendix A-6: PVA of the effects of fisheries take on juveniles and adults). The PVA analysis also indicates that relatively small increases in the taking of juvenile and adult birds can significantly slow population growth, and if take increases by more than 8% for annual juvenile mortality and 1.33% for annual adult mortality, then the species will most likely go extinct, given the conservative parameters used in the model (Appendix A-6):

Table 10. Population viability analysis results for modeled increases in adult and juvenile short-tailed albatross takes.

Percent increase in annual juvenile mortality	Percent increase in annual adult mortality	Approximate years to double current population size
2 (11 total)	0.33 (4.83 total)	21
4 (13 total)	0.67 (5.17 total)	27
6 (15 total)	1 (5.5 total)	50
8 (17 total)	1.33 (5.83 total)	130
> 8	> 1.33	N/A (extinction)

As indicated above, there is a significant jump in the time required to double the current population size when juvenile and adult mortalities exceed 13% and 5.17%, respectively: a 4% increase in the annual juvenile mortality (total 13%) and a 0.67% increase in the annual adult mortality (total 5.17%) increases the time to double the current population by approximately 6 years, whereas a 6% increase in the annual juvenile mortality (total 15%) and a 1% increase in the annual adult mortality (total 5.5%) increases this time by approximately 23 years. An 8% increase in the annual juvenile mortality (total 17%) and a 1.33% increase in the annual adult mortality (total 5.83%) increases the time to double the current population by approximately 80 years. Consequently, annual juvenile and adult mortalities that do not exceed 13% and 5%, respectively, for the Torishima Island population, should not change the current rate of population growth in this species.

In evaluating long-term growth of the short-tailed albatross population, it is important to note that the population growth trajectories discussed above continue to diverge through time (see Appendix A-6). For instance, growth to a population size of 15,000 birds will require approximately 58 years at current levels of mortality. A 2% increase in the annual juvenile mortality (total 11%) and a 0.33% increase in the annual adult mortality (total 4.83%) will increase the time to reach 15,000 birds by approximately 21 years; a 4% increase in the annual juvenile mortality (total 13%) and a 0.67% increase in the annual adult mortality (total 5.17%) will increase this time by approximately 50 years. Consequently, a total annual mortality of around 11% for juveniles and 4.83% for adults might include both short-term reductions in population growth and longer-term rebuilding of the historic short-tailed albatross population.

Additional breeding sites can greatly assist in the rebuilding of the short-tailed albatross population from its dangerously small current size. Establishment of additional short-tailed albatross breeding sites should be considered on Pacific islands that can be managed to protect the birds. The Northwestern Hawaiian Islands that are on secure Service Refuge lands are an example of potential breeding sites. These U.S.-owned islands are currently managed to protect seabirds and represent a unique opportunity for conservation of short-tailed albatross. Additionally, known historic sites should be evaluated as possible sites for reintroduction of short-tailed albatross. Current loss of reproductive contribution, or a small increase in loss, due to adverse effects by the fisheries may slow the building of the short-tailed albatross population, and new sub-populations would aid in buffering the species from stochastic processes or increased take in fisheries. These ideas, and others, are under review by our short-tailed albatross recovery team as they work to draft the recovery plan for this species.

According to information provided by Hasegawa for the PVA conducted in 1999, the worldwide population of short-tailed albatross was about 1,362 birds, roughly half juveniles and half adults. Based on the PVA and its assumptions, at that population size, an annual loss of about 82 subadult s (17% mortality) and 12 adults (5.83% mortality) would lead to eventual extinction of the species. The increase of the short-tailed albatross population since 1999 likely increases the numbers needed to achieve those thresholds. Because the current total annual estimated loss of reproductive contribution due to adverse effects by U.S. fisheries (*i.e.*, 2 short-tailed albatross [Hawaii] + 2 short-tailed albatross [Alaska] = 4 per year) falls short of those levels, the Hawaii-based longline fishery may slow population growth of the species, but is not anticipated to jeopardize the continued existence of the species. Additional data may change the assumptions of our analysis.

V. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

There is potential for oil spills to occur in the action area which could affect short-tailed albatrosses. Service refuge managers and biologists stationed at Midway Atoll National Wildlife Refuge, Tern Islet (French Frigate Shoals) and Laysan Island - Hawaiian Islands National Wildlife Refuge have observed that some seabirds from local breeding colonies die from oil-related impacts. The sources of the oil spills are unknown. However, it is speculated that oil released on the high seas by vessels transiting the central Pacific Ocean may be responsible for these oil-related injuries. Vessels that have sunk in the vicinity of the Hawaiian Islands National Wildlife Refuge may periodically release oil from fuel tanks.
Discarded plastic cigarette lighters and light sticks that drift away from longline gear, among other plastic debris, float in the water column and are consumed by seabirds while they are foraging. The ingestion of plastic may compromise seabirds and result in dehydration and starvation, intestinal blockage, internal injury, or exposure to dangerous toxins (Cousins 1998; Sievert and Sileo 1993). Both Laysan and black-footed albatross that occur within Hawaiian waters have been documented to be affected by plastic debris (WPRFMC 1998).

Drift and trawl nets accumulate in the Northwestern Hawaiian Islands and entangle protected species such as sea turtles, the Hawaiian monk seal and seabirds. A multi-agency State and Federal effort is underway to remove driftnets from several locations within the Hawaiian Islands National Wildlife Refuge. However, as long as fisheries continue to lose fishing gear, protected species will continue to become entangled. At this time, there is not enough information about the threats described above and their impacts on short-tailed albatross to determine the level of impact they might have on the species.

The action area encompasses ocean areas outside the range of most State and private activities. State and U.S.-based private fishing activities, that may affect the short-tailed albatross, such as domestic tuna trolling, occur within the action area. These activities are regulated by the Federal government under the Magnuson Act, but no data exists to evaluate these fisheries. Consistent with applicable consultation regulations, the future effects of domestic fishing activities subject to consultation under the (Endangered Species) Act need not be considered in this analysis.

Japan, Taiwan, Korea, and other fishing nations operate longline vessels in areas which overlap with the known range of the short-tailed albatross and may interact with this species in the action area. However, these nations do not report the rate at which seabirds are caught on longline gear. In order to estimate seabird bycatch rates, foreign vessels should report the rate at which seabirds are caught per 1,000 hooks fished. The very limited information available about seabird bycatch in foreign fishing fleets is summarized in Appendix 1 of HLA and WPRFMC (2004). Without more consistent and detailed information about seabird take in foreign fisheries, we cannot estimate the adverse effects that these fisheries may have on the short-tailed albatross.

VI. Conclusion

At the current population level and the current population growth rate, the level of mortality expected to result from the reopened shallow-set longline fishery in Hawaii, as described in the Description of the Proposed Action section, above, is not likely to jeopardize the continued existence of the short-tailed albatross.

VII. Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of sections 7(b)(4) and 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by NOAA Fisheries so that they become binding conditions of any authorization of the fishery as appropriate, for the exemption in section 7(o)(2) to apply. NOAA Fisheries has a continuing duty to regulate the activity covered by this incidental take statement. If NOAA Fisheries (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, NOAA Fisheries must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

A. Amount or Extent of Take Anticipated

The Service anticipates that one short-tailed albatross per year may be taken as a result of the Hawaii-based shallow-set longline fishing activities regulated by NOAA Fisheries, as calculated in the Analyses for Effects of the Action section, above. The incidental take is expected to be in the form of mortality. An unknown number of short-tailed albatrosses may suffer take in the form of harassment, harming, or wounding. That is, some birds may interact with gear and free themselves without being detected. This form of take differs from the estimated incidental take (*i.e.*, in the form of mortality) in that these birds are injured to an unknown extent and have an unknown likelihood of survival.

Because the Service defines take of short-tailed albatrosses to include mortality resulting from physical interaction with longline gear, it is not necessary to have a dead bird in hand to document take. The record of a short-tailed albatross physically interacting with gear and being hooked and/or obviously injured or killed is sufficient.

The Service considers the observation of a short-tailed albatross in the vicinity of the vessel, actively looking for food, to represent an unknown number or index of short-tailed albatrosses that risk being taken in the Hawaii-based longline fishery. Given NOAA Fisheries' historically low level of observer coverage (approximately 4 to 5% from 1994 to 2001) and the absence of reported observed takes of short-tailed albatrosses in the Hawaii longline fishery, the Service is not able to calculate the rate at which short-tailed albatrosses forage for bait on hooks or "strike a hook," and the number that these observations may represent in terms of birds actually killed or injured. Because an interaction is a behavior that has been documented to precede take in the form of injury or mortality in Laysan and black-footed albatrosses, such interactions must be recorded, although for the purposes of tracking incidental take under this biological opinion an interaction only (*i.e.*, not resulting in obvious injury or mortality) does not constitute a take of a short-tailed albatross. In the Reasonable and Prudent Measures below, we include a requirement for specific observer duties that we believe will begin to address the dearth of information about the presence and behavior of short-tailed albatrosses in the areas where the shallow-set Hawaii-based fishery operates. When we obtain additional data and/or other information about interactions between short-tailed albatrosses and longline gear deployed by Hawaii-based vessels, we may revise this assessment of incidental take.

B. Effects of the Take

The Service has estimated that one (1) short-tailed albatross per year may be taken as a result of the proposed action. This estimate is based on certain assumptions relative to the bird's behavior and distribution in the area of the Hawaiian Islands and its possible interaction with the Hawaii-based longline fishery.

Based on the PVA conducted in 1999 and its assumptions, an annual level of death of about 81.9 subadults (17% mortality) and 11.7 adults (5.83% mortality) would lead to eventual extinction of the species (see the Species Response to the Action section, above). The increase in the short-tailed albatross population since 1999 likely changes these thresholds slightly, and reduces the likelihood that take as a result of the proposed action will exceed these thresholds. Therefore, the shallow-set Hawaii-based longline fishery may slow population growth of the species, but it is not anticipated to jeopardize the continued existence of the species. Furthermore, the short-tailed albatross population has continued to grow despite documented and undocumented mortality in U.S. and foreign commercial fisheries (Sievert 2004). The Service therefore concludes that the level of take anticipated in the shallow-set Hawaii-based longline fishery will not jeopardize the continued existence of the short-tailed albatross, nor will the proposed action result in destruction or adverse modification of critical habitat, as critical habitat is not designated for this species.

The Service will not refer the incidental take of any migratory bird (in this case, the short-tailed albatross) for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

C. Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the potential for and impact of the incidental take of short-tailed albatrosses:

I. Minimize attraction of short-tailed albatross to fishing gear used by the Hawaii-based longline fishery.
II. Monitor the level of take and measures to minimize take.
III. Ensure survivability of injured short-tailed albatrosses.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, NOAA Fisheries must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and specify reporting requirements. These terms and conditions are non-discretionary. The terms and conditions for each reasonable and prudent measure are organized as follows:

I. Minimize attraction of short-tailed albatross to fishing gear used by the Hawaii-based longline fishery.
    - I.A. Side setting and Implementation Timeframe
    - I.B. Additional Seabird Deterrents

II. Monitor the level of take and measures to minimize take in the shallow-set longline fishery.
    - II.A. Annual Reporting
    - II.B. Observer Coverage
    - II.C. Short-tailed Albatross Observer Duties
    - II.D. Observations of Short-tailed Albatross
    - II.E. Quarterly Reports – NOAA Fisheries Observer Program

III. Ensure survivability of injured short-tailed albatrosses and proper identification of short-tailed albatrosses
   III.A. Handling and Rehabilitation of Injured Short-tailed Albatross
   III.B. Disposition of Dead Short-tailed Albatross
   III.C. Annual Workshops
   III.D. Albatross Species Identification Card

In order to implement reasonable and prudent measure I above, the following terms and conditions apply:

I.A. Side-setting and Implementation Timeframe: The proposed action, the reopening of the shallow-set or swordfish sector of the Hawaii-based longline fishery, includes several seabird deterrents measures to be employed north of 23ºN: (1) all sets will use completely thawed and blue-dyed baits, regardless of bait type, as described in the November 28, 2000 Opinion, (2) offal will be deployed strategically to distract birds from pursuing baited hooks, and (3) all setting will take place at night using the minimum vessel lighting needed for crew safety, beginning no earlier than one hour after sunset at the vessel's location, and terminating no later than local sunrise. These measures have been adopted through regulation at 50 CFR 660.35 (2004), and are currently binding on the fishery. For the purposes of this opinion, the Service adopts the NOAA Fisheries definition of set types for shallow sets when deploying longline gear from Hawaii-registered vessels. This definition is described in the *Federal Register* (69 FR 17329).

Although research has shown these seabird deterrents to be effective, and we believe they minimize the risk of incidental take of the short-tailed albatross, these deterrents do have several drawbacks, as described above in the discussion of seabird deterrents in the Effects of the Action section. For example, the few existing data are equivocal about the effectiveness of blue-dyed fin-fish bait as a seabird deterrent in the Hawaii-based fishery. In fact, mackerel-type bait fishes have been shown to hold dye less well than squid, a bait that was previously used in the Hawaii-based shallow-set fishery (G. Lydon, pers. comm., 2004). Furthermore, the effectiveness of night setting likely varies considerably with ambient and artificial light (B. McNamara, pers. comm., 2004).

In new research on seabird deterrents in the Hawaii-based fishery (Gilman *et al*. 2002, 2003a, 2003b), side setting, that is, deploying longline gear from amidships instead of the stern, has yielded promising results as a highly effective seabird deterrent. Side setting also meets several other important criteria for seabird deterrents: it is easy to implement and compliance with a side setting requirement would be easily verified. To date, however, we have insufficient information about the performance of side setting in the fishery at large or over time, and few data about its performance on shallow sets, where, for example, baited branch lines may carry buoyant light sticks and may clear the stern of the vessel before reaching a depth where hooks are unavailable to seabirds. We wish to see assessment of this performance prior to requiring side setting as an adequate and reasonable long-term replacement for some or all of the seabird deterrents currently in use in the shallow-set fishery to minimize the risk to the short-tailed albatross. In response to these points and to the considerations about other deterrents described above, and to employ the best available scientific information on seabird deterrents, we provide the following process for NOAA Fisheries to assess the fishery-wide performance of side setting, and develop a plan for its implementation and monitoring under new fishery regulations. We acknowledge that the National Environmental Policy Act (NEPA) review that is currently underway, and/or future research, may yield a seabird deterrent or combination of deterrents that is as effective as or more effective than side setting and that also meets other criteria (*e.g.*, ease of implementation and compliance monitoring).

I.A.(1). In addition to the 100% observer coverage on shallow-set vessels and within the 20% observer coverage on deep-set vessels, NOAA Fisheries will to the greatest extent possible place trained observers on deep-set vessels that voluntarily implement side setting to document side setting procedures and collect data on take of seabirds. NOAA Fisheries will encourage vessels targeting swordfish to side set. Vessels that voluntarily side set should ideally adhere to the following specifications, but information from vessels that deploy gear from amidships but do not strictly follow these specifications still is extremely valuable.

- Weights: attach a 60-gram swivel within 1 m (3 ft.) of the hook on each branch line;
- Set gear amidships as far forward from the stern as possible;
- Deploy a bird-scaring curtain between the setting position and the stern, as shown below in Figure 10;
- Throw baited hooks forward as close to the vessel hull as possible;
- Clip deployed branch lines to the mainline the moment that the vessel passes the baited hook to minimize tension in the branch line, which could cause the baited hook to be pulled towards the sea surface.

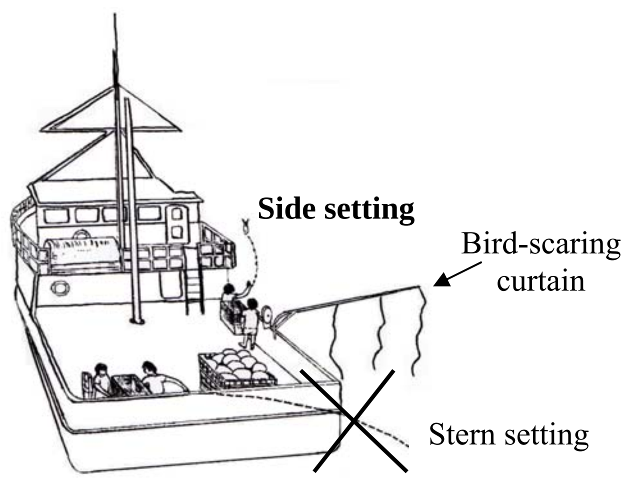

Figure 10. Proper deployment of a bird-scaring curtain when side setting.

I.A.(2). NOAA Fisheries will assess the resulting observer data on the performance of side setting and compare it with observer data and other information on the performance of night setting and thawed and blue-dyed bait in the shallow-set longline fishery and with data on the effectiveness of other seabird deterrents.

I.A.(3). Based on results of this assessment, NOAA Fisheries will develop a timeline for initial implementation and monitoring of side setting, or other equally or more effective measures to minimize the risk of incidental take of the short-tailed albatross, in the shallow-set fishery, and will submit this timeline to the Service by November 1, 2004. This timeline will project the completion of a regulatory amendment for revised seabird deterrent requirements for the entire Hawaii-based longline fishery, which will include measures developed in collaboration with the Service to minimize the risk to the short-tailed albatross. This regulatory amendment will be prepared and promulgated as regulations consistent with requirements under NEPA and the Magnuson Act.

I.A.(4). By August 30, 2005, NOAA Fisheries will implement and monitor side setting, or another appropriate seabird deterrent or combination of deterrents that the Service agrees is at least as effective as side setting in reducing the risk to the short-tailed albatross, in the shallow-set Hawaii-based longline fishery. This extended deadline provides time for NOAA Fisheries to complete review under NEPA and promulgate regulations as required to make changes in fishery management under Magnuson Act. Until new regulations are issued, the seabird deterrents currently included in the proposed action will remain in place.

<u>I.B. Additional Seabird Deterrents:</u> We recognize that some Hawaii-based longline vessels use other seabird deterrents as well as those described in the proposed action and those required under current regulations. Until new regulations for seabird deterrent use in the fishery are promulgated, as described in I.A.(4), above, vessels targeting swordfish in the Hawaii-based longline fishery therefore are not prevented from using the following deterrents <u>in addition to</u> those described in the proposed action and above:

I.B.(1). Side setting, best practiced according to specifications provided above.

I.B.(2). Line-setting machine with weighted branch lines[7]:
The longline may be set with a line-setting machine (line shooter) so that the longline is set faster than the vessel's speed.

I.B.(3). Weighted Branch Lines:
On shallow-set gear, where weighted lines are not currently required, at least 45 grams of weight may be attached to branch lines within 1 m of each baited hook.

I.B.(4). Towed Deterrents:

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[7] This measure, in addition to thawed, blue-dyed bait and strategic offal discharge, is <u>required</u> for deep-set or tuna-target longline vessels operating north of 23º north latitude under the terms and conditions of the November 18, 2004 revised Opinion.

> A line with suspended streamers (tori line) or a buoy that conforms to WPRFMC/NOAA Fisheries standards may be deployed when the longline is being set and hauled. Tori lines or towed deterrents should be constructed and employed according to specifications provided in Garcia and Associates (1999; Appendix A-9).

In order to implement reasonable and prudent measure II above, the following terms and conditions apply:

<u>II.A. Annual Reporting</u>: NOAA Fisheries will report annually the observed and estimated total number of interactions of Laysan and black-footed albatross in the shallow-set sector of the Hawaii-based longline fishery, observed take of short-tailed albatross, and any observations of short-tailed albatross. The information about interactions between only short-tailed albatross and longline gear would not provide us or NOAA Fisheries with sufficient information to gauge the effectiveness of seabird deterrent measures/devices. Therefore, to gauge the effectiveness of these seabird deterrents it is appropriate to collect data from surrogate species (*i.e.*, Laysan and black-footed albatross) that exhibit similar foraging behavior to the short-tailed albatross. NOAA Fisheries currently records observed interactions and estimates total number of interactions for these species.

In addition to reporting interactions and any take as noted above, NOAA Fisheries will evaluate the effectiveness of seabird deterrent measures implemented in the shallow-set sector of the longline fishery in reducing interactions with short-tailed albatross by measuring the rate at which Laysan and black-footed (and short-tailed, if any) albatross are caught by Hawaii-based longline vessels conducting shallow sets. NOAA Fisheries will evaluate and report on the effectiveness of the seabird deterrent regime on an annual basis.

Annual reports will be due within four months of the end of the calendar year. No later than May 1, NOAA Fisheries will report to the Service on the effectiveness of seabird deterrent measures employed in the shallow-set sector of the Hawaii-based longline fishery during the previous calendar year. The report will include (for each shallow-set trip and summarized over all shallow-set trips) all reported observations and mortalities of Laysan, black-footed, and short-tailed albatross, including date, time, location, vessel, vessel type, vessel size, gear description, total number of hooks deployed, total number of trips, and all observer or reported comments.

Annual reports will be submitted by May 1 of the year following the reporting year (*i.e.*, the report for 2004 would be submitted by May 1, 2005, etc.) to: Field Supervisor, U.S. Fish and Wildlife Service; Pacific Islands Fish and Wildlife Office; 300 Ala Moana Boulevard; Room 3-122, Box 50088; Honolulu, Hawaii 96850; telephone 808-792-9400, facsimile 808-792-9581.

An interim report on the assessment of side setting effectiveness on vessels voluntarily using this deterrent will be due November 1, 2004.

<u>II.B. Observer Coverage:</u> The proposed action as described includes that a NOAA Fisheries observer be placed on each longline vessel rigged to set shallow and target swordfish. That is,

every Hawaii-based longline vessel leaving port to target swordfish will carry an observer. This level of coverage provides an opportunity to collect data on seabird interactions with the shallow-set fishery when the set is observed. NOAA Fisheries will vest observers aboard shallow setting Hawaii-based longline fishing vessels with responsibility for recording seabird behavior and interactions with longline gear, in addition to recording observations of other protected species. Each class/cohort of fisheries observers will be trained at NOAA Fisheries Pacific Islands Regional Office, in collaboration with Service personnel, in seabird identification and handling. NOAA Fisheries will ensure that these observers are instructed in their priority duties.

NOAA Fisheries will provide observer coverage for 100% of shallow-set longline trips made by the Hawaii-based fishery. These observers' primary duties are to observe the interactions of protected species, including seabirds, with fishery operations. Observers will monitor the first hour of each set and record seabird sightings and interactions with longline gear, unless or until darkness precludes identification of seabird species. Observers will document seabird sightings and interactions during every haulback of longline fishing gear in its entirety. Details of observer duties as they relate to seabirds are described in II.C and Appendix A-10.

If a short-tailed albatross is sighted, all observers on all vessels will record as much information as possible about the bird's appearance (*e.g.*, plumage) and behavior for as long as the bird is visible (see II.D., below).

II.C. Observer Duties[8]: On all shallow-set trips, observers will collect data on sightings and behavior of short-tailed, Laysan, and black-footed albatrosses and seabird interactions with longline gear during the first hour of setting operations, or until darkness prevents the observer from distinguishing between seabird species. In addition to monitoring the setting of longline gear for interactions with seabirds, observers will conduct two "scan counts" within five-minute windows to count and identify seabirds that are visible from the vessel: one at the beginning of the hour and another 30 minutes later (see Appendix A-10). Observers will record seabird sightings and behavior in the vicinity of longline gear throughout longline haulback operations, and conduct scan counts in five-minute windows at the top of every hour during the haul unless or until darkness precludes identification of seabird species.

Observers will record the behavior of the short-tailed albatross and other seabirds observed, including the following information, on the Protected Species Event Log and Seabird Biological Data Form (Appendices A-11 and A-12):

- the species of birds present
- whether birds attempt to strike at the gear to eat the bait
- the species of birds striking at gear (other than short-tailed albatross)
- the location of birds in relation to the longline gear
- whether birds are either hooked or injured by the gear

[8] Observers for this proposed action receive the same seabird identification and handling training as observers for the tuna fishery.

- number of birds striking at the fishing gear per set and per haulback
- the number of albatrosses of each species that are hauled back on longline gear
- whether the albatross was killed or injured <u>during</u> the haulback
- if albatross are recorded as injured, observers will describe the extent of the injury to the best of their ability.

In addition to the above-mentioned information, written observer reports will include:

- the date of the set
- latitude and longitude the set began and ended
- the type(s) of seabird deterrent measures used
- bait type (and whether it was frozen or thawed and dyed blue)
- amount of weight on hooks
- weather conditions (wind velocity, visibility, and sea state),
- time set began and ended
- number of hooks set
- number of birds within the vicinity of the vessel at the beginning of the set
- bird behavior before and during set
- time haulback began and ended
- latitude and longitude haulback began and ended
- the number of birds, by species, that touch the gear, and their fate and condition

In the event a short-tailed albatross is taken, the handling guidelines (Appendix A-13) will be followed.

<u>II.D. Observations of Short-tailed Albatross:</u> In the event a NOAA Fisheries observer sights a short-tailed albatross during a fishing trip, NOAA Fisheries will alert the Service as soon as possible and will make arrangements for the Service to interview the observer. The interview will occur within seven days of the vessel's return to port. NOAA Fisheries will make available to the Service copies of all relevant information (*e.g.*, notes and comments, pictures) collected by the observer concerning the sighting. Confidential vessel information may be withheld from release and maintained as privileged under the Freedom of Information Act.

In the event that a short-tailed albatross is taken, the observer will notify NOAA Fisheries and NOAA Fisheries will notify the Service immediately. In the event that a short-tailed albatross is either taken or sighted, a report containing all of the information described above will be transmitted to the same address within 30 days of the event or 10 days of the return of the vessel to port, whichever comes first. If a short-tailed albatross is taken, all details regarding the bird (as recorded on the short-tailed albatross recovery sheet [Appendix A-13] and the Seabird Biological Data form [Appendix A-12]) will be included in this report.

<u>II.E. Quarterly Reports – NOAA Fisheries Observer Program:</u> Written reports from the NOAA Fisheries observer program containing summaries of observer data on trip statistics and protected species interactions will continue to be submitted quarterly to the Service, as they are now, using the same contact information given above, under II.A., Reporting. For examples, see the quarterly reports posted on the NOAA Fisheries Pacific Islands Regional Office website:

http://swr.nmfs.noaa.gov/pir/qreports/qreports.htm . These reports are due shortly after the end of each quarter (March 31, June 30, September 30, and December 31).

In order to implement reasonable and prudent measure III above, and as incidental take is permitted for this listed species, the following terms and conditions apply:

III.A. Handling and Rehabilitation of Injured Short-tailed Albatross: NOAA Fisheries will advise fishers and observers that every reasonable effort must be made to save injured short-tailed albatross. For complete details, see Appendix A-13, Handling Guidelines for Short-tailed Albatross. If a short-tailed albatross is recovered alive, it must be retained unless it exhibits all of the following traits:

1. head is held erect and bird responds to noise and motion stimuli;
2. bird breathes without noise;
3. both wings can flap and retract to normal folded position on back; and
4. bird can stand on both feet with toes pointed in the proper direction (forward).

If a recovered albatross exhibits all of these traits, it should be held until dry and then released overboard, but we strongly recommend that NOAA Fisheries be contacted prior to release so a qualified veterinarian or seabird expert can be consulted. If the recovered bird fails to exhibit even one of the above traits, it must, by law, be retained aboard and NOAA Fisheries contacted immediately. The U.S. Coast Guard may be contacted to facilitate communication between the vessel and the NOAA Fisheries. The appropriate NOAA Fisheries personnel will be contacted at any one of the following telephone numbers (by availability, in the order listed):

Kevin Busscher	808/973-2935 extension 215
Jeremy Bisson	808/973-2935 extension 256
Joe Arceneaux	808/973-2935 extension 216

NOAA Fisheries will arrange for a qualified veterinarian or seabird expert from the list included with Appendix A-13 to contact the vessel and provide treatment, recovery, and release guidance.

III.B. Disposition of Dead Short-tailed Albatross: NOAA Fisheries will instruct observers and fishers that any dead short-tailed albatross must be retained aboard and brought back to port. Specimens must be frozen immediately, with identification tags attached directly to the carcass, and a duplicate identification tag attached to the bag or container holding the carcass. Identification tags must include all of the following information: species, date of mortality, name of vessel, location (latitude and longitude) of mortality, observer or captain's name (or both), and any band numbers and colors if the specimen has any leg bands. Leg bands must remain attached to the bird.

NOAA Fisheries will inform observers and fishers that specimens must be surrendered as soon as possible to a NOAA Fisheries or Service office. Specimens must remain frozen and must be shipped as soon as possible to: Field Supervisor, Ecological Services, Pacific Islands Office, US Fish and Wildlife Service, Room 3-122, Honolulu, Hawaii 96850. The contact numbers for the Pacific Islands Office are: telephone 808-792-9400 telephone, facsimile 808 792-9581.

<u>III.C. Annual Workshops</u>[9]: NOAA Fisheries will continue to conduct annual workshops to inform fishers of the risk of short-tailed albatross takes in the Hawaii-based longline fishery. At least one annual workshop will be conducted each year. The workshops will include: information exchange between NOAA Fisheries, WPRFMC, the Service, and fishers about: (1) the use of effective seabird deterrent devices in the fishery, (2) status of the short-tailed albatross population and observations of the bird in the vicinity of the Hawaii-based longline fishing area, and (3) review of albatross species identification. Translations will be provided to Vietnamese and Korean speaking fishers with regard to all educational materials distributed to vessel captains.

In the annual report, NOAA Fisheries will provide the Service with the results of the annual workshop with respect to the: (a) topics discussed (*e.g.* seabird deterrent devices/strategies), (b) list of participants, (c) date, time and location of the workshop.

<u>III.D. Albatross Species Identification Card</u>: Similar to the requirement for the deep-set, tuna-target fishery, NOAA Fisheries will continue to produce the plastic-coated, weatherproof, cards that illustrate albatross species (short-tailed, Laysan and black-footed) for identification purposes, and distribute them to all fishers in the shallow-set Hawaii-based longline fishing fleet. The card should be translated to the Korean and Vietnamese languages and distributed to those fishers whose first language is either Korean or Vietnamese.

<u>Summary of Reporting Requirements</u>

Please note that the following is only a summary and details of written reporting requirements are included in the terms and conditions above. Reporting requirements in this biological opinion may be combined with those in the November 18, 2000 revised Opinion for the tuna fishery.

1. Side setting report:
NOAA Fisheries will provide an interim report on the assessment of side setting effectiveness on vessels voluntarily using this deterrent by November 1, 2004.

2. Annual reports:
NOAA Fisheries will report annually by May 1 the total observed number of fishery interactions with Laysan, black-footed, and short-tailed albatross in the shallow-set fishery (from Term and Condition II.A).

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[9] Similar reporting is required under November 18, 2002 revised Opinion for the tuna fishery, and the information from both sectors of the fishery may be compiled into a single report.

NOAA Fisheries will evaluate annually the effectiveness of all required seabird deterrent devices by measuring the rate at which Laysan, black-footed, and short-tailed albatrosses are caught by Hawaiian longline vessels, by set type (from Term and Condition II.A).

In addition to recording all albatross injured or killed during fishery operations, NOAA Fisheries observers will record sightings of all albatross species during the set and haulback of the main line (from Term and Condition II.C), and these data will be summarized in the annual report.

NOAA Fisheries will report to the Service the results of the annual workshop with respect to the: (a) topics discussed (*e.g.*, seabird deterrent devices/strategies), (b) list of participants, (c) date, time and location of the workshop (from Term and Condition I.C).

Annual reports are due within four months of the end of the calendar year, *e.g.*, for 2004, the report would be due by May 1, 2005.

3. Quarterly reports:
The NOAA Fisheries observer program will continue to send quarterly data summaries to the Service (from Term and Condition II.C.). These reports are shortly after the end of each quarter (March 31, June 30, September 30, and December 31).

4. Short-tailed albatross sightings and interactions:
In the event that a short-tailed albatross is taken, NOAA Fisheries and the Service will be notified immediately. In the event that a short-tailed albatross is either sighted or taken, NOAA Fisheries will arrange an interview by the Service of the observer within seven days of the vessel's return to port. A written report of the sighting or take will be submitted to the Service within 30 days of the event or 10 days of the return of the vessel to port, whichever comes first (from Term and Condition II.D., III.A., and III.B.). If a short-tailed albatross is taken, all details regarding the bird (as recorded on the short-tailed albatross recovery sheet; see Appendix A-13) will be included in this report.

All reports from NOAA Fisheries described above will be submitted to: Field Supervisor, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office; 300 Ala Moana Boulevard; Room 3-122, Box 50088; Honolulu, Hawaii 96850; telephone 808 792-9400; facsimile 808 792-9580.

Table 10. Summary of reporting dates.

Report Type	Due Date
Side setting, interim	November 1, 2004
Annual	By May 1, within four months of end of calendar year
Quarterly, Observer Program	Following March 31, June 30, September 30, and December 31
Short-tailed albatross sightings and interactions	Within 30 days of the event or 10 days of vessel's return to port, whichever is soonest

VIII. Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

To keep the Service informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of the following conservation recommendation:

(1) NOAA Fisheries should coordinate with the governments of Japan, Korea, Taiwan, and other Pacific fishing nations the collection of fishery effort and seabird injury and mortality information from fishing vessels that conduct fishery operations similar to U.S. fisheries that deploy gear such as longline and hook-and-line gear. NOAA Fisheries should collect catch per unit effort (per thousand hooks) data from these countries. If historical catch per unit effort (per thousand hooks) is accessible to NOAA Fisheries, this information should be submitted to the Service. NOAA Fisheries should also seek to obtain the rate at which seabirds are hooked per 1,000 hooks. These rates can be used to estimate the possible number of short-tailed albatross that may be hooked in these fisheries and the collective impact that longline fisheries may have on short-tailed albatross. Concerning incidental catch of short-tailed albatross, NOAA Fisheries should seek to obtain any and all records of short-tailed albatross that are accidentally caught by fishing vessels from these countries, where and how they were caught, and the disposition of the birds upon release.

(2) NOAA Fisheries should conduct a study to determine whether the circle hooks now required in the shallow-set fishery reduce hooking-related injuries to seabirds, and compare these results with hooking-related injuries to seabirds caused by "J" hooks in the Hawaii-based longline

fishery. Circle hooks are designed to hook an animal on the jaw, thus avoiding damage to internal soft tissue. If an animal hooked in this manner falls off or is brought on board to have the hook removed, and then is released, it may have a greater chance at survival. If the results of such a study indicate that circle hooks cause fewer hooking related injuries to seabirds than "J" hooks, then the Service would recommend that circle hooks be selected as the only type of hook to be used in the deep-set or tuna-target sector of the Hawaii-based longline fishery, which now uses "J" hooks.

(3) NOAA Fisheries should continue to support research into effective seabird deterrent devices and strategies that reduce risk of interaction between seabirds and Hawaii-based longline gear and fishing-related activities. For example, underwater setting chutes and capsules and lining tubes, all of which deploy gear at a depth sufficient to prevent birds from settling on hooks during the set should continue to be tested for use as seabird deterrents. NOAA Fisheries should coordinate with and communicate the results of these analyses to the Service. The Service would analyze the results of the research and determine whether results indicate a probably significant reduction in seabird interactions with longline gear in the Hawaii-based fishery. If so, then the Service may amend this biological opinion and incorporate these new seabird deterrent devices or strategies into the terms and conditions.

(4) NOAA Fisheries should investigate the rate at which Laysan and blackfooted albatross "fall off" longline gear as a result of being injured, hooked, or entangled during the set. NOAA Fisheries investigators should analyze the number of birds that may be injured, hooked, or entangled during the set and compare this amount with the number of birds that are documented injured, hooked or entangled during the haulback. Understanding the rate at which birds may "fall off"longline gear will influence the analyses that relate to estimating the number of Laysan and black-footed albatross that are killed in the Hawaii longline fishery each year. Refining these analyses will help the NOAA Fisheries and Service gauge the effectiveness of the various seabird deterrent devices and ultimately, help reduce the risk of interaction between short-tailed albatross and the Hawaii-based longline fishery.

IX. Reinitiation Notice

This concludes formal consultation on the reopened shallow-set, swordfish-target sector of the Hawaii-based longline fishery as regulated by NOAA Fisheries. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) in the event of a major population decline as a result of a natural environmental catastrophe or oil spill, in which case the effects of longline fisheries on short-tailed albatross could be seriously exacerbated; (4) agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (5) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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APPENDICES

Figure 13. Longline billfish catches in the SPC Statistical Area, 1962-1997. Source: SPC and NMFS, HL.

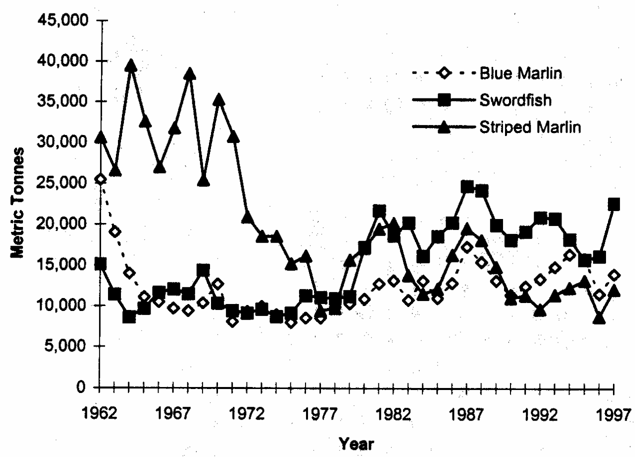
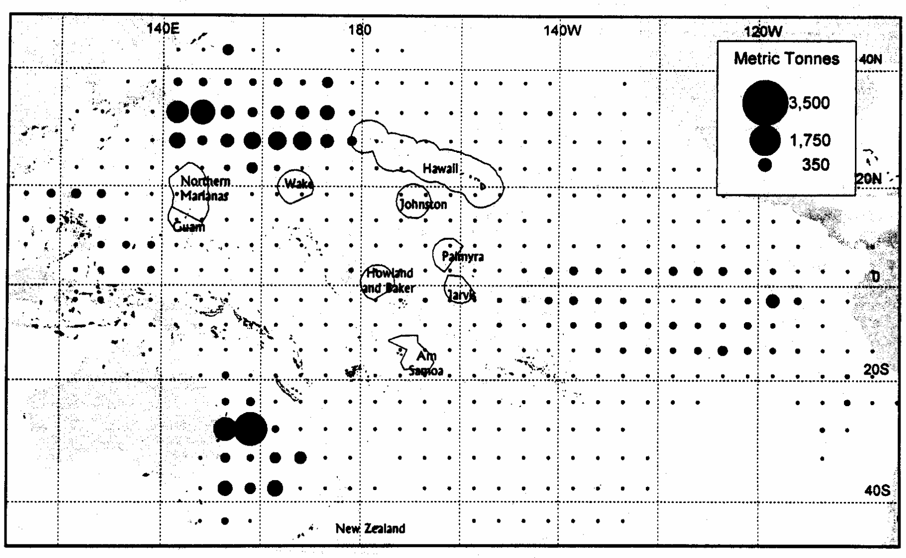


Figure 14. Distribution of longline catches of swordfish in 1997 between 40° S and 40° N, by 5° geographic square.



JAPANESE LONGLINE VESSEL CATCHES OF SWORDFISH - Distant Water Fleet
Source - 1998 Annual Report "Pelagic Fisheries of the Western Pacific Region" December, 1999-Western Pacific Regional Fishery Management Council (Honolulu, HI)(Fig.13 and 14).

Figure 7. Longline tuna catches between 40° S and 40° N, 1962-1997. Source: SPC and NMFS, HL.

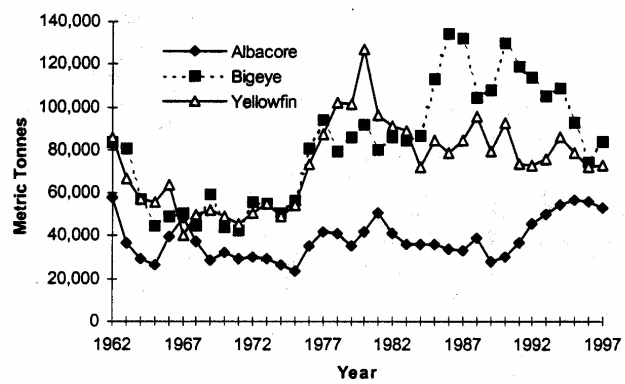
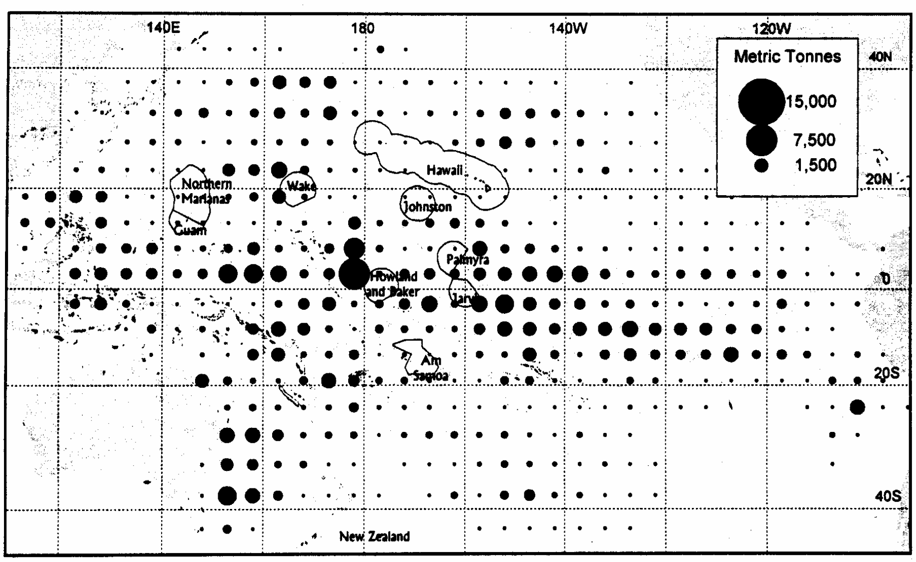


Figure 8. Distribution of longline catches of all tuna species in 1997 between 40° S and 40° N, by 5° geographic square.



JAPANESE LONGLINE VESSEL CATCHES OF TUNA- Distant Water Fleet
Source - 1998 Annual Report "Pelagic Fisheries of the Western Pacific Region" December, 1999-Western Pacific Regional Fishery Management Council (Honolulu, HI).

Table 2. Swordfish catch (metric tons) by gear type in the Pacific Ocean.

Year	Offshore and distant water longline	Coastal LL	Driftnet	Harpoon	Others	Total
1980	8,913	824	1,746	398	72	11,953
1981	10,301	675	1,848	129	125	13,078
1982	8,957	839	1,257	195	102	11,350
1983	10,272	955	1,033	166	85	12,511
1984	9,529	1,141	1,053	117	147	11,987
1985	11,607	980	1,133	191	98	14,009
1986	11,721	960	1,264	123	133	14,201
1987	12,814	819	1,051	87	97	14,868
1988	13,394	665	1,234	173	40	15,506
1989	9,633	752	1,596	362	41	12,384
1990	9,432	690	1,027	128	15	11,292
1991	8,453	799	498	153	33	9,936
1992	8,654	1,181	887	381	22	11,125
1993	12,125	1,394	292	309	48	14,168
1994	11,053	1,357	421	308	40	13,179
1995	10,120	NA	NA	NA	NA	NA

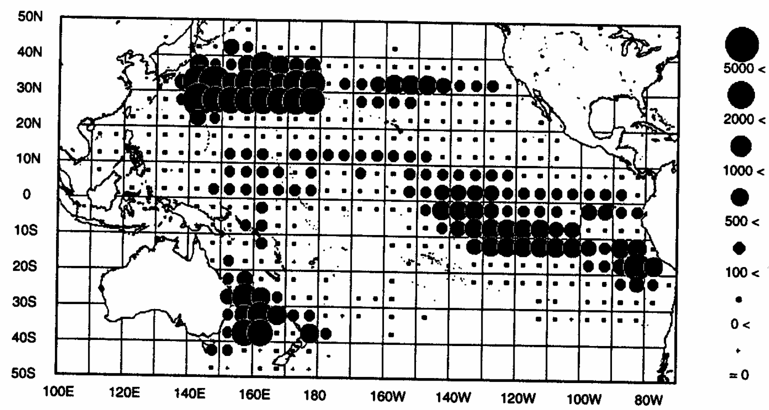


Figure 1. Geographic distribution of mean swordfish catch (thousand fish per year) of the Japanese longline fishery in the 1990s.

JAPANESE LONGLINE CATCHES OF SWORDFISH- Distant and Coastal Fleets
Source - Proceedings of the Second International Pacific Swordfish Symposium, NOAA Technical Memorandum NMFS, (NOAA-TM-NMFS-SWFSC-263), Edited by Gerard T. DiNardo, June 1999.

Table 4. Japanese longline effort (hooks) in the western-central (WCPO) and eastern Pacific Ocean (EPO). EPO statistics are from the IATTC (1997).

	Japanese longline effort (hooks)		
Year	WCPO	EPO	Total
1980	222,381,200	138,140,800	360,522,000
1981	241,908,400	131,275,104	373,183,504
1982	224,574,300	116,199,848	340,774,148
1983	197,720,200	127,176,160	324,896,360
1984	202,896,900	119,635,456	322,532,356
1985	211,479,200	106,757,808	318,237,008
1986	183,896,700	160,552,528	344,449,228
1987	193,584,100	188,392,544	381,976,644
1988	213,026,100	182,694,224	395,720,324
1989	197,725,900	170,373,088	368,098,988
1990	182,776,300	178,419,456	361,195,756
1991	174,895,000	200,364,704	375,259,704
1992	156,768,800	191,283,709	348,052,509
1993	170,586,400	159,955,430	330,541,830
1994	163,249,300	163,976,027	327,225,327
1995	150,761,600	125,145,630	275,907,230
1996	144,444,800	125,000,000	269,444,800

JAPANESE LONGLINE VESSELS "HOOKS SET" (FROM 1980 - 1996)

Source - Secretariat of the Pacific Community "A Summary of Current Information on the Biology, Fisheries, and Stock Assessment of Bigeye Tuna (*Thunnus obesus*) in the Pacific Ocean, With Recommendations for Data Requirements and Future Research" - J. Hampton, K. Bigelow, and Marc Labelle. Oceanic Fisheries Programme Technical Report No. 36, Noumea, New Caledonia. 1998.

BIRD/LONGLINE INTERACTION FORM

Date 03 ~~02~~/28/97 Bird line deployed? yes____ no ✓

Observer KLC

Weather conditions: wind velocity —windy visibility good-

precipitation yes___ no ✓ sea state overcast

swell height 20ft

Time set began 03:09 ended 03:57

Latitude-Longitude set began 30.27.058 °N 153.42.785 °W ended 30.27.210 °N 153.36.657 °W

Number of hooks set 150 hooks

Bait type ½ live milkfish / ½ Squid Frozen or thawed thawed

Amount of weight on hooks 60 grams

Number of birds within 200 meters of vessel at beginning of set (by species)

No Birds

Behavior before and during setting

Time haulback began 08:04 ended 09:21

Latitude-Longitude haulback began 30.28.070 °N 153.43.570 °W ended 30.28.822 °N 153.37.952 °W

List of birds touching gear in any way and their fate and condition
(species)(hooked, entangled, or struck?) (location of hook) (condition of bird - dead, alive and injured, alive and apparently unharmed)

1 Shorttail Albatross Adult flying by haul back

30+ Blackfooted Albatross

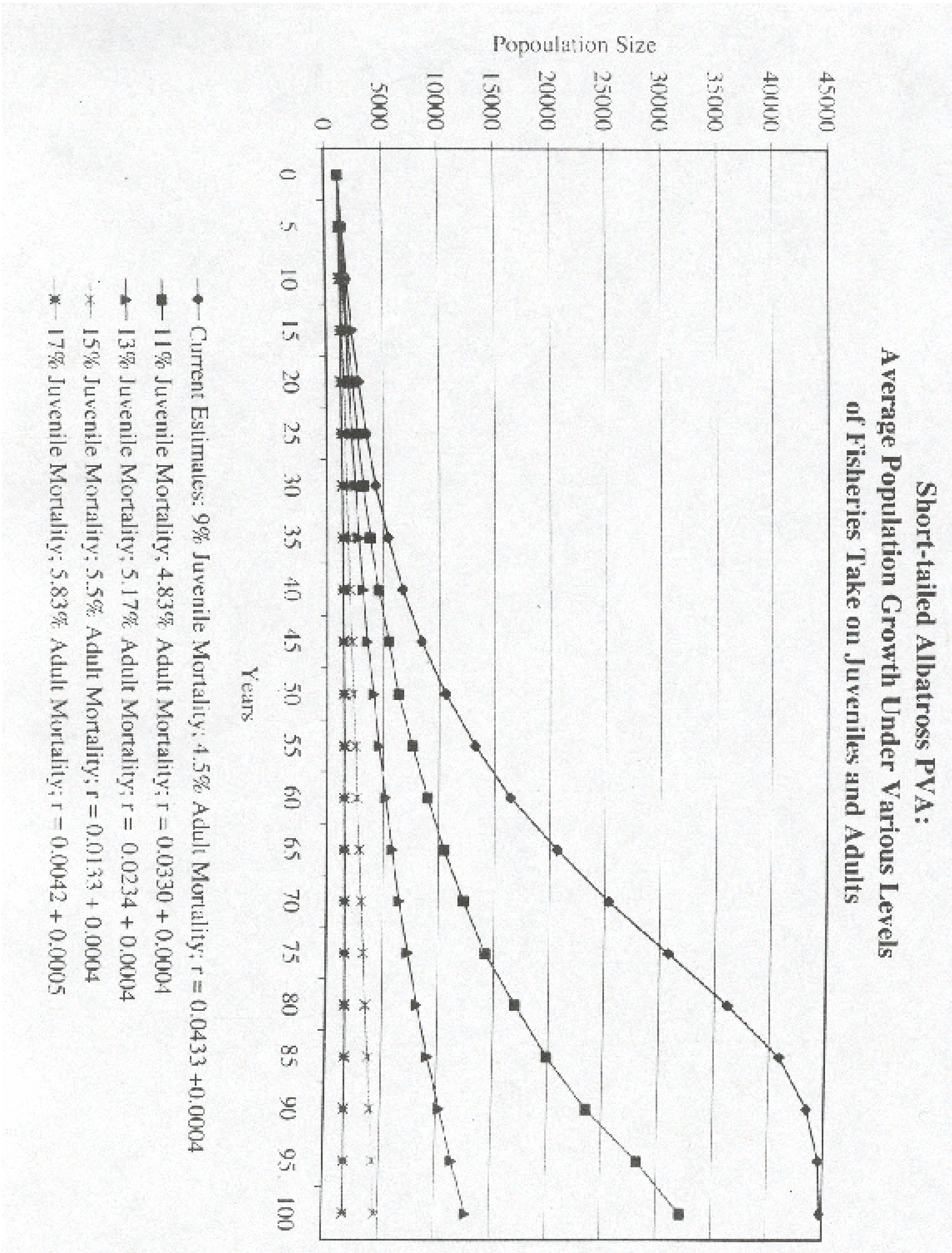
1 Laysan Albatross

Shorttail was actively looking for bait on hooks in haul back

Information about catch - species composition, Ø

number caught Ø

APPENDIX A-5



Short-tailed Albatross PVA:
Average Population Growth Under Various Levels
of Fisheries Take on Juveniles and Adults
Popoulation Size
0
5000
10000
15000
20000
25000
30000
35000
40000
45000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Years
Current Estimates: 9% Juvenile Mortality; 4.5% Adult Mortality; r = 0.0433 +0.0004
11% Juvenile Mortality; 4.83% Adult Mortality; r = 0.0330 + 0.0004
13% Juvenile Mortality; 5.17% Adult Mortality; r = 0.0234 + 0.0004
15% Juvenile Mortality; 5.5% Adult Mortality; r = 0.0133 + 0.0004
17% Juvenile Mortality; 5.83% Adult Mortality; r = 0.0042 + 0.0005

APPENDIX A-6

Short-tailed albatross life table (from Cochrane and Starfield 1999)

	Survivorship	Number Surviving to Age X	Prop. Surv. Age X	Average Years Lived Age X to Age X+1	Life Expectancy at Age X	Expected Age at Death
Fledged	0.940	100	1.000	0.970	25.05	25.05
1	0.940	94	0.940	0.912	25.62	26.62
2	0.940	88	0.884	0.857	26.23	28.23
3	0.940	83	0.831	0.806	26.87	29.87
4	0.940	78	0.781	0.757	27.55	31.55
5	0.940	73	0.734	0.712	28.28	33.28
6	0.980	72	0.690	0.683	29.05	35.05
7	0.980	70	0.676	0.669	28.63	35.63
8	0.980	69	0.663	0.656	28.21	36.21
9	0.980	68	0.649	0.643	27.77	36.77
10	0.980	66	0.636	0.630	27.33	37.33
11	0.980	65	0.624	0.617	26.88	37.88
12	0.980	64	0.611	0.605	26.42	38.42
13	0.980	62	0.599	0.593	25.94	38.94
14	0.980	61	0.587	0.581	25.46	39.46
15	0.980	60	0.575	0.569	24.97	39.97
16	0.980	59	0.564	0.558	24.47	40.47
17	0.980	58	0.552	0.547	23.96	40.96
18	0.980	56	0.541	0.536	23.44	41.44
19	0.980	55	0.531	0.525	22.91	41.91
20	0.980	54	0.520	0.515	22.37	42.37
21	0.980	53	0.510	0.504	21.81	42.81
22	0.980	52	0.499	0.494	21.25	43.25
23	0.980	51	0.489	0.484	20.67	43.67
24	0.980	50	0.480	0.475	20.08	44.08
25	0.980	49	0.470	0.465	19.48	44.48
26	0.980	48	0.461	0.456	18.87	44.87
27	0.980	47	0.451	0.447	18.24	45.24
28	0.980	46	0.442	0.438	17.61	45.61
29	0.980	45	0.433	0.429	16.95	45.95
30	0.980	44	0.425	0.421	16.29	46.29
31	0.980	43	0.416	0.412	15.61	46.61
32	0.980	43	0.408	0.404	14.92	46.92
33	0.980	42	0.400	0.396	14.22	47.22
34	0.980	41	0.392	0.388	13.50	47.50

Fledged	Survivorship	Number Surviving to Age X	Prop. Surv. Age X	Average Years Lived Age X to Age X+1	Life Expectancy at Age X	Expected Age at Death
35	0.980	40	0.384	0.380	12.76	47.76
36	0.980	39	0.376	0.373	12.01	48.01
37	0.980	38	0.369	0.365	11.25	48.25
38	0.980	38	0.361	0.358	10.47	48.47
39	0.980	37	0.354	0.351	9.67	48.67
40	0.980	36	0.347	0.344	8.86	48.86
41	0.980	35	0.340	0.337	8.03	49.03
42	0.980	35	0.333	0.330	7.18	49.18
43	0.980	34	0.327	0.323	6.32	49.32
44	0.980	33	0.320	0.317	5.43	49.43
45	0.980	33	0.314	0.311	4.54	49.54
46	0.980	32	0.307	0.304	3.62	49.62
47	0.980	31	0.301	0.298	2.68	49.68
48	0.980	31	0.295	0.292	1.73	49.73
49	0.250	8	0.289	0.181	0.75	49.75
50	0.010	0	0.072	0.037	0.51	50.51

APPENDIX A-7, continued.

Modeled lost productivity, based on the loss of one four-year-old albatross (from Cochrane and Starfield 1999).

	Expected Natural Deaths	Lost Juvenile Bird Years	Discou. Lost Juv. Bird Years	Number of Lost Progeny	Lost Progeny Bird Yrs. Disc. Life	Discou. Lost Progeny Bird Years	Discou. Total Lost Bird Years
Fledged							
1							
2							
3							
4	0.060	0.940	0.913				0.913
5	0.056	0.884	0.833				0.833
6	0.018	0.866	0.792	0.182	2.629	2.406	3.199
7	0.017	0.849	0.754	0.179	2.577	2.289	3.043
8	0.017	0.832	0.717	0.175	2.525	2.178	2.896
9	0.017	0.815	0.683	0.172	2.475	2.073	2.755
10	0.016	0.799	0.649	0.168	2.425	1.972	2.621
11	0.016	0.783	0.618	0.165	2.377	1.876	2.494
12	0.016	0.767	0.588	0.162	2.329	1.785	2.373
13	0.015	0.752	0.559	0.158	2.283	1.698	2.258
14	0.015	0.737	0.532	0.155	2.237	1.616	2.148
15	0.015	0.722	0.506	0.152	2.192	1.538	2.044
16	0.014	0.708	0.482	0.149	2.148	1.463	1.945
17	0.014	0.693	0.458	0.146	2.105	1.392	1.850
18	0.014	0.680	0.436	0.143	2.063	1.324	1.760
19	0.014	0.666	0.415	0.140	2.022	1.260	1.675
20	0.013	0.653	0.395	0.137	1.982	1.199	1.594
21	0.013	0.640	0.376	0.135	1.942	1.141	1.516
22	0.013	0.627	0.357	0.132	1.903	1.085	1.443
23	0.013	0.614	0.340	0.129	1.865	1.033	1.373
24	0.012	0.602	0.324	0.127	1.828	0.982	1.306
25	0.012	0.590	0.308	0.124	1.791	0.935	1.243
26	0.012	0.578	0.293	0.122	1.755	0.889	1.182
27	0.012	0.567	0.279	0.119	1.720	0.846	1.125
28	0.011	0.555	0.265	0.117	1.686	0.805	1.070
29	0.011	0.544	0.252	0.115	1.652	0.766	1.018
30	0.011	0.533	0.240	0.112	1.619	0.729	0.969
31	0.011	0.523	0.228	0.110	1.587	0.694	0.922

	Expected Natural Deaths	Lost Juvenile Bird Years	Discou. Lost Juv. Bird Years	Number of Lost Progeny	Lost Progeny Bird Yrs. Disc. Life	Discou. Lost Progeny Bird Years	Discou. Total Lost Bird Years
Fledged							
32	0.010	0.512	0.217	0.108	1.555	0.660	0.877
33	0.010	0.502	0.207	0.106	1.524	0.628	0.835
34	0.010	0.492	0.197	0.104	1.493	0.597	0.794
35	0.010	0.482	0.187	0.102	1.464	0.568	0.756
36	0.010	0.472	0.178	0.099	1.434	0.541	0.719
37	0.009	0.463	0.169	0.097	1.406	0.515	0.684
38	0.009	0.454	0.161	0.096	1.377	0.490	0.651
39	0.009	0.445	0.153	0.094	1.350	0.466	0.619
40	0.009	0.436	0.146	0.092	1.323	0.443	0.589
41	0.009	0.427	0.139	0.090	1.296	0.422	0.561
42	0.009	0.418	0.132	0.088	1.271	0.401	0.533
43	0.008	0.410	0.126	0.086	1.245	0.382	0.507
44	0.008	0.402	0.120	0.085	1.220	0.363	0.483
45	0.008	0.394	0.114	0.083	1.196	0.346	0.459
46	0.008	0.386	0.108	0.081	1.172	0.329	0.437
47	0.008	0.378	0.103	0.080	1.148	0.313	0.416
48	0.008	0.371	0.098	0.078	1.125	0.298	0.396
49	0.278	0.093	0.024	0.020	0.281	0.072	0.096
50	0.092	0.001	0.000	0.000	0.003	0.001	0.001
Total	**0.999**	**27.051**	**16.173**	**5.313**	**76.602**	**43.807**	**59.980**

APPENDIX A-8, continued.

FINAL REPORT

Hawaii Longline Seabird

Mortality Mitigation Project

Prepared for:

Western Pacific Regional Fisheries Management Council
(WESPAC)
1164 Bishop St., Suite 1400
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September 1999

APPENDIX A-9

4.0 FIELD RESEARCH

A total of five seabird bycatch mitigation research trips of approximately thirty days duration were conducted on Hawaii pelagic longline vessels. One trip was on a tuna vessel (employing a mainline shooter) targeting bigeye tuna. Four trips were on swordfish vessels (no mainline shooter) using swordfish gear to target swordfish and/or bigeye tuna. Seabird behavioral observation data were collected during daylight hours. Tori lines, towed buoy systems, modified offal discarding practices, blue-dyed baits, night setting (swordfish vessels only) and control tests were conducted during commercial longline fishing operations. Data on effects of night setting on mortalities were collected based on seabirds found dead during hauls because seabird observations could not be made at night. Multi-variate factors relating to environmental conditions and gear variation between vessels were recorded on field data forms and considered in final analyses. Research aims and objectives for each mitigation technique and gear are listed below.

4.1 Mitigation Measure Descriptions and Usage

This study tested mitigation techniques and gears that deter seabirds from interacting with the gear by either: 1) frightening seabirds away from baited hooks, or 2) reducing attraction or visibility of baited hooks. Tori lines and towed buoy systems scare seabirds away from the area where baited hooks first enter the water. Blue-dyed baits, no offal discards, strategic offal discards, and night setting serve to reduce visibility of baited hooks or attraction to the vessel.

Adaptation and modification of mitigation measures and gear were carried out on each trip to adjust to individual vessels, and to improve the effectiveness and decrease the intrusiveness of these measures on fishing operations.

4.1.1 Tori Line. Tori lines were designed for Japanese longline tuna vessels and function to deter seabirds by having streamers fluttering in the air close enough to the surface to keep the seabirds from flying under them (Brothers 1995). The tori line system tested during this project was a modified Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) version (CCAMLR 1993; see Appendix C). The tori line was attached to a sturdy fiberglass pole (tori pole) that secured near the stern of the vessel on a swiveling steel base. The base was placed atop the setting house or shelter deck on the stern of the vessel (Plate 7) approximately 2 m from the stern and 2 m inboard of the gunwale. The height of the attachment point above water ranged from 4.5–7.2 m.

The tori line varied from 140–175 m long depending on the length of the Zone of Opportunity established for the individual vessel. It was made of 1/4-inch, three-strand poly line, and had six detachable aerial streamers. The aerial streamers were made of flexible material that moved freely and unpredictably and were designed to be long enough so they dangled just above the water's surface. The portion of the tori line that trailed in the water had short (10–25 cm) plastic water streamers. The tori line incorporated a 1/2-inch hollow braid poly drogue section at the terminal end rather than a terminal buoy. The drogue reduced entanglements with fishing gear that crossed the tori line. To achieve full effectiveness, the researcher tried to assure that the tori line was positioned directly above

APPENDIX A-9, continued.

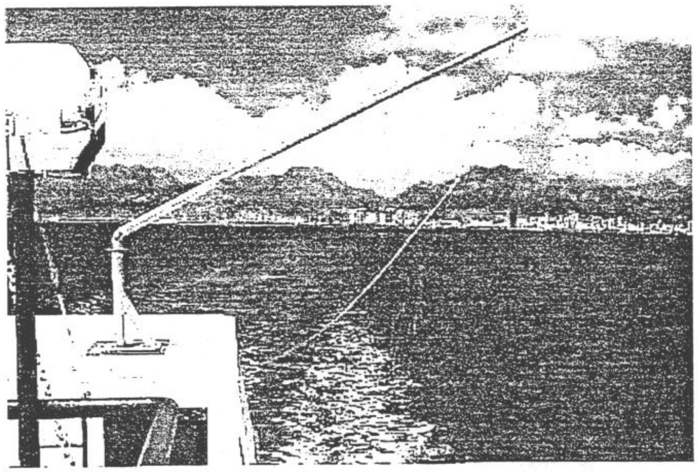


Plate 7a. Tori line and pole: the pole and swivelling steel base were mounted on top of the baitshack.

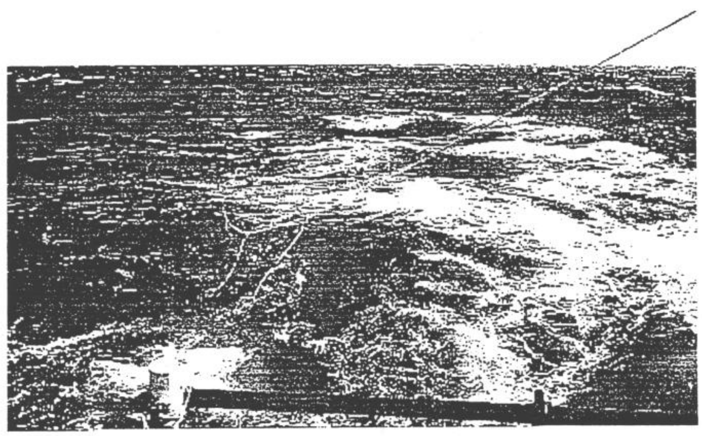


Plate 7b. Tori line deployed on the haul. Note: albatross have landed behind aerial streamer portion.

APPENDIX A-9, continued.

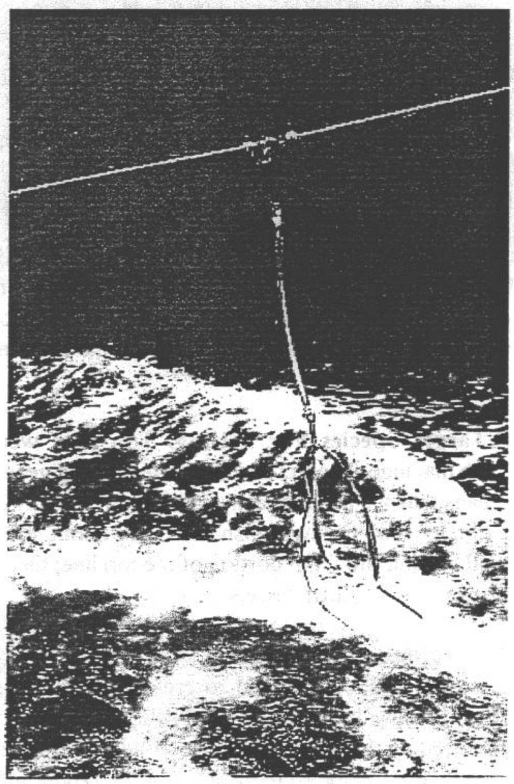


Plate 7c. Aerial streamer of graduated lengths were attached to the tori line (following page). See Appendix C for construction instructions.

APPENDIX A-9, continued.

the area where the baited hooks were deployed. The height of the attachment point, length of the tori line, and weight of the aerial streamers determined the distance that the aerial streamer portion remained aloft behind the vessel (see Appendix C).

Procedure for Setting. Prior to deployment of the tori line, the researcher and the captain of the vessel determined the wind direction relative to the vessel's setting course. The researcher positioned the tori pole so that the aerial portion of the tori line would best cover the area where baited hooks entered the water, while assuring that the terminal end would not cross the mainline or entangle suspender floats. The first radio buoy of the fishing gear was then deployed. Either the researcher or a crewman would then throw the tori line drogue overboard so that the tori line would then trail out behind the vessel. When the tori line was fully deployed and aerial streamers were up, the crew began setting the baited hooks. The baited hooks were thrown outside the vessel wake and under the protection of the aerial streamers. The researcher and the crew had to continually monitor the tori line for positioning, possible entanglements with fishing gear, and effects of sea state and weather.

Procedure for Hauling. During hauling operations, the tori pole was positioned so that the aerial streamers and terminal buoy best covered the area that baited hooks were brought near to or trailed on the waters surface. The position of the tori line was closely monitored because vessels slow, stop, back up, and turn repeatedly during hauls. This was found to be the best time to make adjustments to the pole positioning.

Modifications by Vessel/Target Species For Setting. Tori lines were designed for setting operations on tuna vessels with mainline shooters and associated fishing gear. The resulting increased sink rate of baited hooks means that the aerial streamer portion of the tori line on these vessels can usually cover the hooks until they sink. On swordfish vessels (without shooters), baited hooks are available near the surface well beyond the aerial portion of the tori line; therefore, the tori lines were made up to 35 m longer for use on swordfish vessels.

Modifications by Vessel/Target Species For Hauling. During hauls, the tori line was shortened to approximately 50 m, and a terminal buoy attached to create enough tension to keep the aerial streamers aloft. This was done because the Zone of Opportunity is much shorter during hauls, and the vessels stop and back up frequently. The aerial portion needs to cover only the distance the branchlines extend behind the boat (usually 20 m or less). In this study, only four shortened aerial streamers were used to cover the area where baited hooks trail on the surface during the haul.

4.1.2 Towed Buoy System. This technique works on the same principal as the tori line. It was expected that a towed streamer line with one or more buoys would be more effective than the tori line for two reasons: 1) tension on the tow line created by the buoy increases the distance that the aerial streamer portion remains aloft behind the vessel, and 2) the bouncing and splashing of the buoy distracts the seabirds. In most cases, the tow line was attached to the same base and pole used for the tori line. The tow lines tested varied from 140–175 m long. Tow lines were tested in two formats: 1) with one buoy at the terminal end; and 2) with two buoys, one at the midpoint and one at the terminal end (Plate 8). The use of a second buoy at the mid-point was abandoned after several breakdowns caused by the middle buoy submerging under swells and creating too much drag on the towing pole. Permanent 1-m-long plastic strap aerial streamers were incorporated in the buoy towing

APPENDIX A-9, continued.

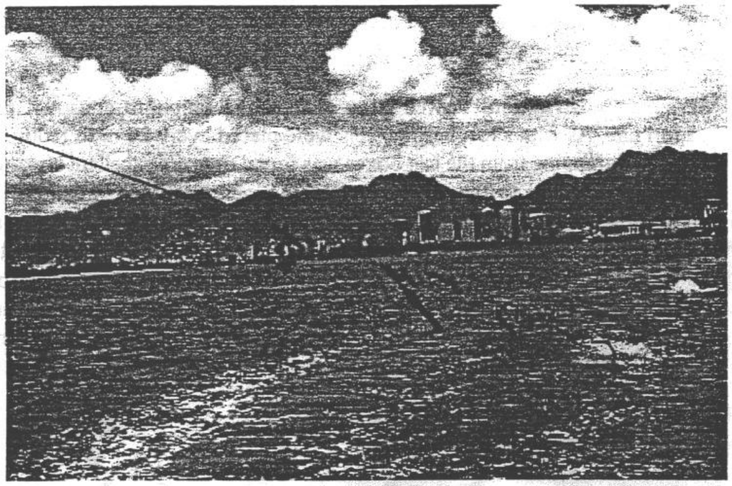


Plate 8a. Towed buoy system being deployed.

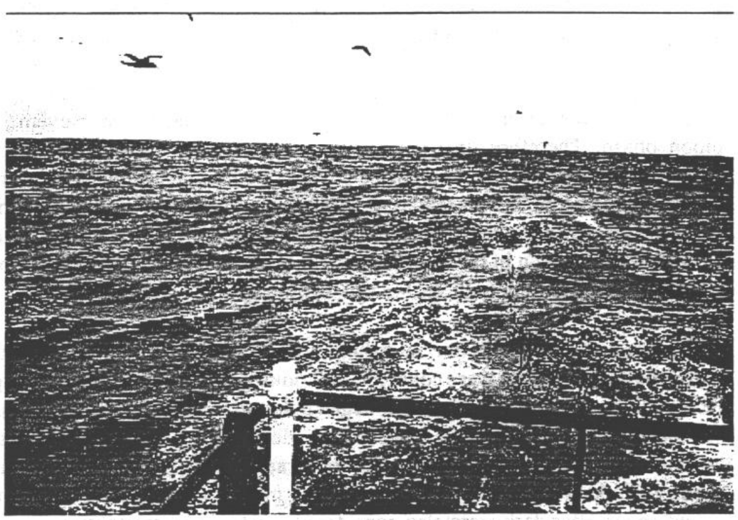


Plate 8b. Towed buoy system with one terminal buoy deployed during gear haul.

APPENDIX A-9, continued.

line to increase effectiveness (CCAMLR 1993; Appendix C). This system also incorporates 1/4-m-long plastic strap water streamers.

Mitigation Measure Construction. Towed buoy systems are simple to construct and use less hardware than a tori line. As with a tori line, swivels were placed every 20 m to reduce twisting in the towing line. Plastic strapping from the bait boxes was found to make excellent streamers and did not wrap around the towing line to the same extent as the longer tori line streamers. The plastic streamers were simply woven through the towing line at 1-m intervals. Attaching another buoy to the towing line was found to significantly increase the distance the aerial portion remains aloft behind the vessel and added another bouncing, splashing deterrent to frighten seabirds. This became problematic in large swells and or rough weather as the forward buoy would submerge and put too much tension on the towing pole. Materials needed for construction are essentially the same as for tori lines.

Procedure for Setting. See tori line procedure.

Procedure for Hauling. See tori line procedure.

Modifications by Vessel/Target Species. Just as the tori line was designed to best cover the Zone of Opportunity for each vessel, the towed buoy system was designed taking into account the distance behind the vessel that baited hooks are available to seabirds. The towed buoy system line was lengthened by up to 35 m to cover the extended Zone of Opportunity for swordfish vessels.

APPENDIX A-9, continued.

Hawaii Longline Observer Program

Observer Field Manual

Pacific Islands Regional Office

3 June 2004
(updated 7 Sep 04)

Manual Version: LM.04.06.03

Pacific Islands Region
National Marine Fisheries Service
National Oceanic and Atmosphere Administration
United States Department of Commerce

APPENDIX A-10

Special Notice For Recording Seabird Sighting Data

(these instructions do not cover sea turtle or marine mammal sightings)

During the Haul

Seabird Sightings During the Haul:
During haulback operations, record seabird sightings by doing a "Scan Count". You will do a Scan Count once an hour, at the top of the hour; after the haul has started. For example, if a haul starts at 7:55am, you would do your first Scan Count for that haul at 8:00am. If the haul started at 8:00am, you would do your first Scan Count for that haul at 9:00am.

A Scan Count is performed by doing a 360° look around the vessel from your observation post to determine the species and number of seabirds. Do this during the first five minutes of the hour, and only count the seabirds you are able to identify. If any seabirds are too far away for you to identify, don't count them. Do not spend more than five minutes scanning for seabirds. Make a sketch, if needed, to aid with difficult identifications.

After you've done a scan count for seabirds, you only need to record the following data elements on the PSEL.

Data for the Scan Counts:

-Date and the start and end times

-Group/Individual ID and Event Type Code (S)

-Activity of the vessel (and set number, if appropriate)

-Sighting method and weather code

-The species observed and their numbers

Each species observed during a scan count is recorded on a line, and assigned to the same Group ID number. In the case there are more than one species observed, you will only need to record the start time and date for the first line. Each Group ID recorded from a scan count requires only one End Event line.

►If no birds are seen during a scan count; you still need to record the data. Use the species code aVE. The number of birds will be recorded as "zero" (0). If you see birds after you've completed a scan count, even 1 minute later, do not record them as being observed during the scan count. They weren't there when you did the scan count.

Seabird Interactions During the Haul:
All observed incidents of seabirds observed making contact (incl. becoming hooked or entangled) with the gear should be recorded on the PSEL as completely and as soon as possible.
Observed incidents of seabirds making obvious attempts (*i.e.* unsuccessful dives on baited hooks or captured fish) should be recorded on the PSEL as completely as possible.

During the Set

Seabird Sightings During the Set:
During setting operations, you will observe for seabird interactions for one hour (1 hr) after the start of the set. Do two scan counts during the hour. Do the first scan count at the beginning of the set and the second at 30 minutes into the set.*

Data for the Scan Counts:
-Date and the start and end times
-Group/Individual ID and Event Type Code (S)
-Activity of the vessel (and set number, if appropriate)
-Sighting method and weather code
-The species observed and their numbers

Seabird Interactions During the Set:
All observed incidents of seabirds observed making contact (incl. becoming hooked or entangled) with the gear should be recorded on the PSEL as completely and as soon as possible. It may be difficult to determine the exact number of birds involved in an interaction. Try to determine as best you can given the local conditions, an estimate of the numbers of individuals involved in any observed interaction.♠

Observed incidents of seabirds making obvious attempts (*i.e.* unsuccessful dives on baited hooks) should be recorded on the PSEL as completely as possible. It may be difficult to determine the exact number of birds making attempts. Try to determine as best you can, given the local conditions, an estimate of the numbers of individuals making attempts.♠

During the setting of the longline, seabirds that are observed injured (hooked or entangled) or killed should be recorded on the PSEL.

If it becomes too dark to identify or count seabirds that may be present before the hour is up; stop observing and record the time you stopped observing.

*The reason that a final count at the end of the hour was not requested is that when vessels set their gear after sunset the ambient light may be insufficient to obtain reasonably accurate identifications and numbers of any seabirds following the vessel.

♠Obtaining accurate counts of sea birds involved in interactions with fishing gear may present difficulties to field workers. The NMFS and USFWS are aware of the realities of the situation. The presence or absence of interactions is very important in assessing the efficacy of seabird bycatch mitigation techniques. Even imprecise estimates of the numbers of individuals are useful when documenting the frequency at which seabird interactions occur and any associated time and location factors.

Under ideal circumstances, even experienced field workers attempting to accurately quantify seabird numbers during fishing operations would hard pressed to capture data as precise as what one would desire.

Observer ID

DOC/NOAA Fisheries
Pacific Islands Region
Longline Observer Program

Trip No.

Protected Species Page No.

Protected Species Event Log

Write ***PSI comments*** and ***PSI Identifying Characteristics*** for specific Protected Species Event Log records in the Comments Log.

Page No.	Line No.	Event No.	Day	Month	Year	Hour	Minute	Group/Individual ID	Event Type Code	Vess. Activity Code	Set No.	Sighting Method	Degree	Minute	Direction N/S	Degree	Minute	Direction E/W	Weather Code	Species English Name Abbr.	Species Code	Behavior Code	Condition Code	Low Estimate	Best Estimate	High Estimate	Sketch Drawn ?	Photo Taken ?	Comment Written?	Form Code	Page No.	Line No.
			Event Date/Time										Latitude			Longitude								Species Count			✓	✓	✓	Association		
	1													.			.										☐	☐	☐			
	2													.			.										☐	☐	☐			
	3													.			.										☐	☐	☐			
	4													.			.										☐	☐	☐			
	5													.			.										☐	☐	☐			
	6													.			.										☐	☐	☐			
	7													.			.										☐	☐	☐			
	8													.			.										☐	☐	☐			
	9													.			.										☐	☐	☐			
	10													.			.										☐	☐	☐			

Event Type Codes
B Behavior
A Approach
C Contact
X Event Ended

Vessel Activity Codes
01 Gear Retrieval
02 Gear Set
03 Gear Drift/Float
04 Pre-Set Preparation
05 Post Haul Clean-up
06 Running
07 Other

Sighting Method Codes
00 Not determined
01 Sighted with naked eye
02 Sighted with binoculars
03 Sighted by capt./crew, then Observer
04 Sighted by capt. or crew only
09 Other

Weather Codes
00 Not determined
01 Clear
02 Partly cloudy
03 Layers of clouds
04 Drizzle
05 Showers
06 Rain
07 Thunderstorms
08 Rain and fog
09 Fog/thick haze
10 Snow, rain/snow mix
99 Other

Most Common Protected Species

Code	*English Name* *Abbr.*
dNG	Black-Footed Albatross
dIM	Laysan Albatross
aVE	Birds
CC	Loggerhead Sea Turtle
LV	Olive Ridley Sea Turtle
DC	Leatherback Sea Turtle
CM	Green Sea Turtle
UH	Hard Shell Sea Turtles
PC	False Killer Whale
GG	Risso's Dolphin
GM	Shortfinned Pilot Whale
UW	Whales/Dolphins/Porpoises
TT	Bottlenose Dolphin
MN	Humpback Whale

Behavior Codes
01 Physical contact w/gear
02 Attempt, no contact
03 Near gear, within 50 m
04 Near gear, 51 to 150 m
05 Feeding on catch
06 Porpoising
07 Bow riding
08 Breaching
09 Swimming at surface
10 Milling
11 Motionless at surface
12 Vessel avoidance
13 Vessel attraction
99 Other

Condition Codes
01 Unknown
02 Alive, not injured
03 Injured
04 Killed
05 Dead, fresh
06 Decomposed

form v. PS.04.06

APPENDIX A-11

Observer ID

DOC/NOAA Fisheries
Pacific Islands Region
Longline Observer Program

Protected Species Comments

From front of this form — Trip No. | Page No.

(Precede each comment with the appropriate line number. Use as many lines as needed.)

Line	Comments

form v. PS.04.06.Back

APPENDIX A-11, continued.

Observer ID

DOC/NOAA Fisheries
Pacific Islands Region
Longline Observer Program

Trip No.

Set No.

Seabird Biological Data Form

Species Code

Most common species:

DIM	Laysan Albatross
DNG	Blackfoot Albatross
DAL	Short-tail Albatross
DSP	Unidentified Alb.
AOT	Other Albatross

Photo? ✓
Specimen? ✓
Sketch? ✓
Tag? ✓
Comment? ✓ (Enter comments on back of this form.)

Catch Form Page No.
Catch Form Line No.

Capture

Date/Time: Day, Month, Year (2 0), Hour, Minute

Latitude: Deg., Decimal Min. (.), N/S

Longitude: Deg., Decimal Min. (.), E/W

Landed ? ✓

Tags Present? Y Yes / N No / U Unk.

Release

Date/Time: Day, Month, Year (2 0), Hour, Minute

Latitude: Deg., Decimal Min. (.), N/S

Longitude: Deg., Decimal Min. (.), E/W

Disposition (0)

01 Previously dead
02 Relsd. unharmed
03 Relsd. injured
04 Killed accidentally
05 Escaped
06 Treated as catch
07 Other
08 Unknown

Hooking/Entanglement

Hooked ? Y Yes / N No / U Unknown

Entangled ?

Hook Location (0)

Entangle Location (0)

01 Ingested (in esophagus)
02 Head/Beak
03 Wing
04 Body
05 Unknown
06 Tail
07 Leg/Foot

How Gear Removed

00 Unknown
01 Fell from gear, point unknown
02 Fell from gear, while in water.
03 Fell from gear, once out of water.
04 Fell from gear, by force of roller.
05 Removal req. cutting gear/animal
06 Removal with no cutting.
07 Foul hooked, cut from gear.
08 Foul hooked, removed from gear
10 Bird caught-gangion on line
11 Bird caught-gangion not on line
99 Other

Remaining Gear

X None
H Hook
L Line
B Both Hook and Line

Describe hook or line and length left on animal:

Morphology

Bill Color (0)

01 Dark gray-black
02 Buff-cream/pink-gray
03 Bright pink

Mantle Color (0)

01 Dark gray-black
02 Solid brown
03 White/light back

Head Color (0)

01 Dark gray
02 White with dark lores
03 White

Tip of bill is a different color from the rest of the bill. ✓

Light Device

Complete only if light devices were used and the light device type has been indicated on the gear configuration form.

Color

01 Blue	06 Yellow	11 Red
02 Green	07 Magenta	12 Orange
03 Black	08 Mixed	13 Silver/Metal
04 Pink	09 Other	
05 White	10 Clear	

Proximity (0)

00 On this branch line
01 Light is 1 branch line away
02 Light is 2 branch lines away
03 Light is 3 branch lines away
04 None in vicinity

form v. SB.04.06

APPENDIX A-12

Observer ID

DOC/NOAA Fisheries
Pacific Islands Region
Longline Observer Program

From front of this form

Trip No.

Page No.

Catch Form Page No.

Catch Form Line No.

Seabird Biological Data Form Comments

Comments:

Injuries Description:

Identifying Characteristics:

form v. SB.04.06.Back

APPENDIX A-12, continued.

APPENDIX A-13: Handling & Release Guidelines for Short-tailed Albatross Hooked or Entangled in the Hawaiian Longline Fishery

I. SAFETY ISSUES:

A. Personal Protective Equipment

1. Gloves
2. Safety Glasses (if available)
3. Long Sleeves

B. Safe Handling Techniques

1. Prior to handling bird, set up a cardboard box in a quiet, well-ventilated area. Place one beach towel on inside bottom of box for cushioning.
2. Working in teams of two, put on gloves and use a clean towel or blanket to cover the bird to protect its feathers from fish oil and handling damage. For maximum safety for the bird (and you), always hold the head with one hand and tuck the bird under your other arm. When holding the head, never wrap your hand completely around the neck (you could suffocate the bird). Rather, the back of the bird's head should be against the palm of your hand and your fingers should have a firm grasp at the base of the skull or bill.
3. Keep the bird's bill away from you and your partner's face and bare skin (try to hold the bird at hip-level or below for handler's safety).

C. Safety Concerns

1. Bills - sharp tips and edges can cause scratches, cuts, and crushing bites. Keep the bill away from the face and bare skin.
   a. Maintain control of head, hold back of head and not the bill, do not block the nares (nasal openings).
   b. Cover the bird's eyes to calm it down.
   c. Wear gloves
   d. Keep the bill away from face and exposed skin
2. Wings - can cause painful bruising
   a. Fold naturally and gently to body to avoid injury to bird's bones, muscles, and tendons
   b. Cover and restrain with a sheet or towel, do not hold too tightly as the bird needs to naturally move breast to breathe
3. Feet - nails can cause scratches and cuts
   a. Wear gloves and long sleeves
   b. Cover bird's feet with sheet or towel to control movement.

II. CAPTURE AND HANDLING:

A. Albatross Sighting and Vessel Control

1. Fishers scan main line as far ahead as possible in order to sight albatross in advance. This scanning reduces the possibility of the albatross being jerked out of the water.
2. Do not get ahead of the main line while picking up gear to reduce the chance of fouling or running over gear and albatross.
3. Upon sighting the albatross: STOP VESSEL and PUT IN NEUTRAL.
4. Retrieve leader with albatross slowly, keeping a gentle, consistent tension on the line. Avoid tugging or yanking line quickly.
5. Ensure that enough slack or play is left in the line to keep the albatross near the vessel yet in the water until it can be determined when you can safely bring the bird on board.
6. If the bird is flying, gently pull bird on board and try not to further entangle bird in line.

B. Retrieval of Albatross from Water

1. If vessel is equipped with "cut-out doors," use this area to bring albatross aboard to minimize the distance from the water.
2. Lift bird on board using a long handled dip net. DO NOT USE LEADER LINE, GAFFS, OR SHARP OBJECTS to retrieve the albatross.
3. Support the bird's body weight when removing from water, do not pull on bird's neck.

C. Handling Guidelines

1. Review Safety Issues
2. Upon retrieval of bird onto vessel, cover bird with a towel or sheet to calm bird and reduce risk of injury to handler and bird.
3. Gain control of head.
    a. Hold head and not bill.
    b. Do not block the nares (nasal openings)
4. Gently remove bird from net
    a. One person untangles bird's wings, bill, and feet from net while second person keeps bird covered and controls bird's head.
5. Restrain bird with a clean towel.
    a. Ensure wings and legs are folded to body naturally.
    b. Do not hold too tightly to prevent injury and to ensure movement of breast necessary for proper breathing.
    c. Do NOT hold by soft tissue, such as neck.
6. Cover bird's eyes to calm bird.
7. Try to hold bird no higher than hip-level for handler's safety.
8. Prevent bird's feathers from becoming dirty with oils or other products as this affects bird's waterproofing, body temperature control, and ability to fly.

III. ASSESS BIRD'S CONDITION:

A. Assess bird's condition

1. After retrieving bird from water and removing from dip net, place bird on deck in a safe area and observe bird prior to handling further.
2. Determine if bird is dead or alive. A dead bird will be unresponsive to surroundings, unable to stand, have no blink reflex, and will not be breathing.

B. Dead Albatross Procedures

1. Record relevant information on data sheet and bird figures (e.g., band numbers, date, time, location, wounds, hooks, etc.)
2. Attach identification tag directly to the carcass, and attach a duplicate identification tag to the bag or container holding the carcass. Tags should be filled out in pencil or waterproof ink. Immediately place carcass in freezer. Identification tags should include the following information: species, date of mortality, location (latitude and longitude) of mortality, trip number, sample number, and any band numbers if the bird has a leg band. Leg bands, hooks, and line must remain attached to the bird.
3. Immediately contact one of the following National Marine Fisheries Service (NOAA Fisheries) personnel at the following numbers (by availability, in the order listed). The U.S. Coast Guard or the U.S. Fish and Wildlife Service's (USFWS) French Frigate Shoals station may be contacted to facilitate communication between the vessel and NOAA Fisheries if unable to contact NOAA Fisheries directly.

National Marine Fisheries Service

Joe Arceneaux — Work: 808-973-2935 extension 216
Fax: 808-973-2941
E-mail: Stuart.Arceneaux@noaa.gov

Kevin Busscher — Work: 808-973-2935 extension 215
Fax: 808-973-2941
E-mail: kevin.busscher@noaa.gov

U.S. Coast Guard - Point Reyes, California, Radiotelephone, Continuous Watch

Call Sign: NMC

Daytime ITU Channel	Ship Transmits (kHz)	Shore Transmits (kHz)

816	08240.0	08764.0
1205	12242.0	13089.0
Nighttime ITU Channel	Ship Transmits (kHz)	Shore Transmits (kHz)
424	04134.0	04426.0
601	06200.0	06501.0

U.S. Fish and Wildlife Service, French Frigate Shoals
Contact Frequency: 10054.0
Call Signs: KOJ638 Tern Island or KOJ639 Honolulu

4. Dead birds must be surrendered, as soon as possible following return to port, to a NOAA Fisheries or USFWS office. Birds can be returned to ports on the following islands: Midway, Kauai, Oahu, Maui, and Hawaii.

C. Living Albatross Procedures

1. Observation Checklist - complete the following observations and record I nformation on data sheet prior to handling bird further:
   a. Can the bird stand and hold head upright?
   b. Is the bird alert, responsive, aware of surroundings (i.e., does it snap at you or otherwise react to you when approached)?
   c. Are the eyes open?
   d. Does the bird breathe with its bill closed (i.e., no open bill breathing)?
   e. Does the bird breathe quietly (i.e., no sounds)?
   f. Is the bird holding its wings in a normal position up and against the body (i.e., not drooping)?
   g. Can the bird flap its wings?
   h. Is the bird free from visible damage? (If damaged, the wounds should be noted on bird figures)
   i. Is the bird free of hooks and fishing line? (If bird is hooked or entangled in line, note location on bird figures)
   j. Is the bird banded? If yes, record the band number on the data sheet.
2. Immediately contact appropriate personnel at the following numbers (by availability, in the order listed). The U.S. Coast Guard or the USFWS French Frigate Shoals station may be contacted to facilitate communication between the vessel and NOAA Fisheries.

National Marine Fisheries Service

Joe Arceneaux	Work:	808-973-2935 extension 216
	Fax:	808-973-2941
	E-mail:	Stuart.Arceneaux@noaa.gov
Kevin Busscher	Work:	808-973-2935 extension 215
	Fax:	808-973-2941
	E-mail:	kevin.busscher@noaa.gov

U.S. Coast Guard - Point Reyes, California, Radiotelephone, Continuous Watch

Call Sign: NMC

Daytime ITU Channel	Ship Transmits (kHz)	Shore Transmits (kHz)
816	08240.0	08764.0
1205	12242.0	13089.0
Nighttime ITU Channel	Ship Transmits (kHz)	Shore Transmits (kHz)
424	04134.0	04426.0
601	06200.0	06501.0

U.S. Fish and Wildlife Service, French Frigate Shoals
Contact Frequency: 10054.0
Call Signs: KOJ638 Tern Island or KOJ639 Honolulu

NOAA Fisheries will arrange for a qualified veterinarian or seabird expert to contact the vessel and provide treatment, recovery, and release guidance.

3. If all observation checklist questions can be answered “yes”, the bird is releaseable. However, it is strongly recommended that the NOAA Fisheries be contacted prior to release so a qualified veterinarian or seabird expert can be consulted. All Release Guidelines should be followed.

IV. TREATMENT

A. General Treatment Guidelines:

1. If the bird does not meet the release criteria, it should be held on board for a minimum of 24 hours while the captain/observer repeatedly attempts to contact NOAA Fisheries personnel.
2. Following contact by the vessel, NOAA Fisheries will arrange for a qualified veterinarian/seabird expert to contact the vessel and relay care and treatment procedures.
3. With the exception of removing entangled lines, do NOT treat, release, or euthanize bird unless directed to do so by a qualified seabird expert or veterinarian.
4. If you have any doubts about removing objects, wait until able to discuss with a veterinarian or seabird expert.
5. If the captain/observer is unable to contact NOAA Fisheries personnel within 24 hours, then follow guidelines for hook removal under the Recovery Section.

B. Entanglement in Lines

1. Hold bird following Handling Guidelines.
2. Do NOT tug on line.
3. Using bandage scissors, cut line as close as possible to hook.

C. Assess Hooking

1. Note location of hook on bird figures.
2. Determine degree of hooking (light, medium, or deep - see figure of hooking)
    a. <u>Light Hooking</u>: hook is clearly visible and caught in bill, leg, webbing of feet, or wing.
    b. <u>Medium Hooking</u>: hook is located in mouth or throat.
    c. <u>Deep Hooking</u>: hook has been swallowed and is located inside the body below the neck.

V. RECOVERY

A. Recovery Area

1. Place a cardboard box with ventilation holes in a quiet, well-ventilated area. Place one beach towel on inside bottom of box for cushioning.
2. Do NOT place bird in a hot or exposed area such as the engine room, near an exhaust stack, or in an exposed area on deck
3. Following assessment of condition and treatment, gently place bird in box and cover open top of box with a beach towel to calm the bird.
4. Do NOT provide food or water.

B. ***Observation Period***

1. Observe bird, being careful not to place face within striking distance of bill, at 30 minutes, 1 hour, and periodically thereafter. Note condition on data sheet. Observations should be minimized to prevent disturbance to the bird.
2. Follow veterinarian/seabird expert instructions for care and treatment of bird.

C. ***Hook Removal***

1. Light Hooking:
    - a. Make repeated attempts to contact NOAA Fisheries for a minimum of 24 hours. If contacted, follow veterinarian/seabird expert instructions.
    - b. If unable to contact NOAA Fisheries after repeated attempts within a 24 hour period, then follow these procedures:
        - 1) Remove hook by using bolt cutters to pare the hook barb and then thread the hook out backwards.
        - 2) Allow the bird to dry, drying may take anywhere from 1 to 4 hours.
        - 3) Release bird ONLY if it meets all release criteria. Follow release guidelines.
        - 4) If bird does not meet release criteria, continue to hold bird and contact NOAA Fisheries.
2. Medium Hooking:
    - a. Make repeated attempts to contact NOAA Fisheries for a minimum of 48 hours. If contacted, follow veterinarian/seabird expert instructions.
    - b. If unable to contact NOAA Fisheries after repeated attempts within a 48 hour period, then follow these procedures:
        - 1) Remove hook - If possible, remove hook by using bolt cutters to pare the hook barb and then thread the hook out backwards. If the hook is located in such a way that prevents paring the barb, cut the line as close to the eye of hook as possible and push the hook out barb first. Observe wound sight for bleeding. Allow the bird to dry, drying may take anywhere from 1 to 4 hours. Release bird only if it meets all release criteria. Follow release guidelines. If the bird does not meet release criteria, continue to hold bird and contact NOAA Fisheries.
        - 2) Release bird ONLY if it meets all release criteria. Follow release guidelines.
        - 3) If bird does not meet release criteria, continue to hold bird and contact NOAA Fisheries.
3. Deep Hooking:

a. Deeply hooked birds will not survive at sea and must be brought in for veterinary care. If a bird is deeply hooked, contact NOAA Fisheries immediately and return to port (Midway, Kauai, Oahu, Maui, or Hawaii) as directed by a veterinarian for transfer to NOAA Fisheries or USFWS personnel or their authorized representative.

VI. RELEASE GUIDELINES:

A. Release Criteria

1. Do NOT release dead birds. These birds should be frozen and transferred to a NOAA Fisheries, USFWS, or other authorized representative.
2. Every effort should be made to contact NOAA Fisheries prior to releasing a live bird.
3. Birds must meet all of the following criteria prior to release:
   a. Head is held erect and bird responds to noise and motion stimuli;
   b. Bird breathes without noise;
   c. Both wings can flap and retract to a normal folded position on back;
   d. Bird can stand on both feet with toes pointed in the proper direction (forward); and
   e. No evidence of hooks, lines, or wounds on birds with the exception of those areas where hooks or lines have been removed prior to release (hooks and line entanglement should be noted on the short-tailed albatross figures).
4. Bird’s feathers must be dry prior to release. Drying time may take from ½ to 4 hours.
5. Data sheets should be completed prior to release.
6. Photographs of the bird prior to and during release are recommended.

B. Release Method

1. STOP VESSEL and place in neutral.
2. Ease albatross gently onto the water, through cut-out door if so equipped.
3. Observe that the albatross is safely away from the vessel before engaging the propeller and continuing operations.
4. Note date, time, location, and behavior of albatross on data forms.

TOOLBOX:

It is recommended that each vessel have the following items on board for handling hooked or entangled albatross:

1. Cardboard Box (open top measuring approximately 4'x4'x4' [minimum size 3'x3'x3'] with ventilation holes on all sides)

2. Bandage Scissors for removing fishing line
3. Large Plastic Bags
4. Beach Towels (4)
5. Tags
6. Record-keeping forms
7. Gloves
8. Bolt Cutters
9. Knife
10. Safety Glasses (optional)
11. Camera (optional)
12. Pencils
13. Waterproof pen (optional)

Veterinarian & Seabird Expert Contacts for Short-tailed Albatross Hooked or Entangled in the Hawaiian Longline Fishery

contact in the following order:

1. ***Thierry Work DVM***
   USGS-BRD National Wildlife Health Research Center
   Hawaii Field Station
   P.O. Box 50167
   Honolulu, HI 96850
   Work: 808-541-3445
   Fax: 808-541-3472
   E-mail: thierry_work@usgs.gov

2. ***Linda Elliot***
   International Bird Rescue & Research Center (IBRRC)
   Hawaii Office: 808-884-5576
   Main Office in California: 707-207-0380
   After Hours Cell Phone: 707-249-4870
   E-mail: IBRRCHI@aol.com

3. ***Doug Chang DVM***
   Aloha Animal Hospital
   4224 Waialae Ave.
   Honolulu, HI 96816
   Work: 808-734-2242
   E-mail: alohavet@aol.com

4. ***Ben Okimoto DVM***
   Honolulu Zoo
   151 Kapahulu Ave.

Honolulu, HI 96815
Work: 808-971-7180
E-mail: hnzoovet@hgea.org

5. ***Gregg Levine DVM***
Sea Life Park Hawaii
41-202 Kalanianaole Highway
Waimanalo, HI 96795
Work: 808-259-2535
Fax: 808-259-7373
E-mail: glevinedvm@aol.com

6. ***Beth Flint***
U.S. Fish and Wildlife Service
Pacific/Remote Islands National Wildlife Refuge Complex
300 Ala Moana Blvd., Rm. 5-231
PO Box 50167
Honolulu, HI 96850
Work: 808-792-9553
Fax: 808-792-9586
E-mail: Beth_Flint@fws.gov

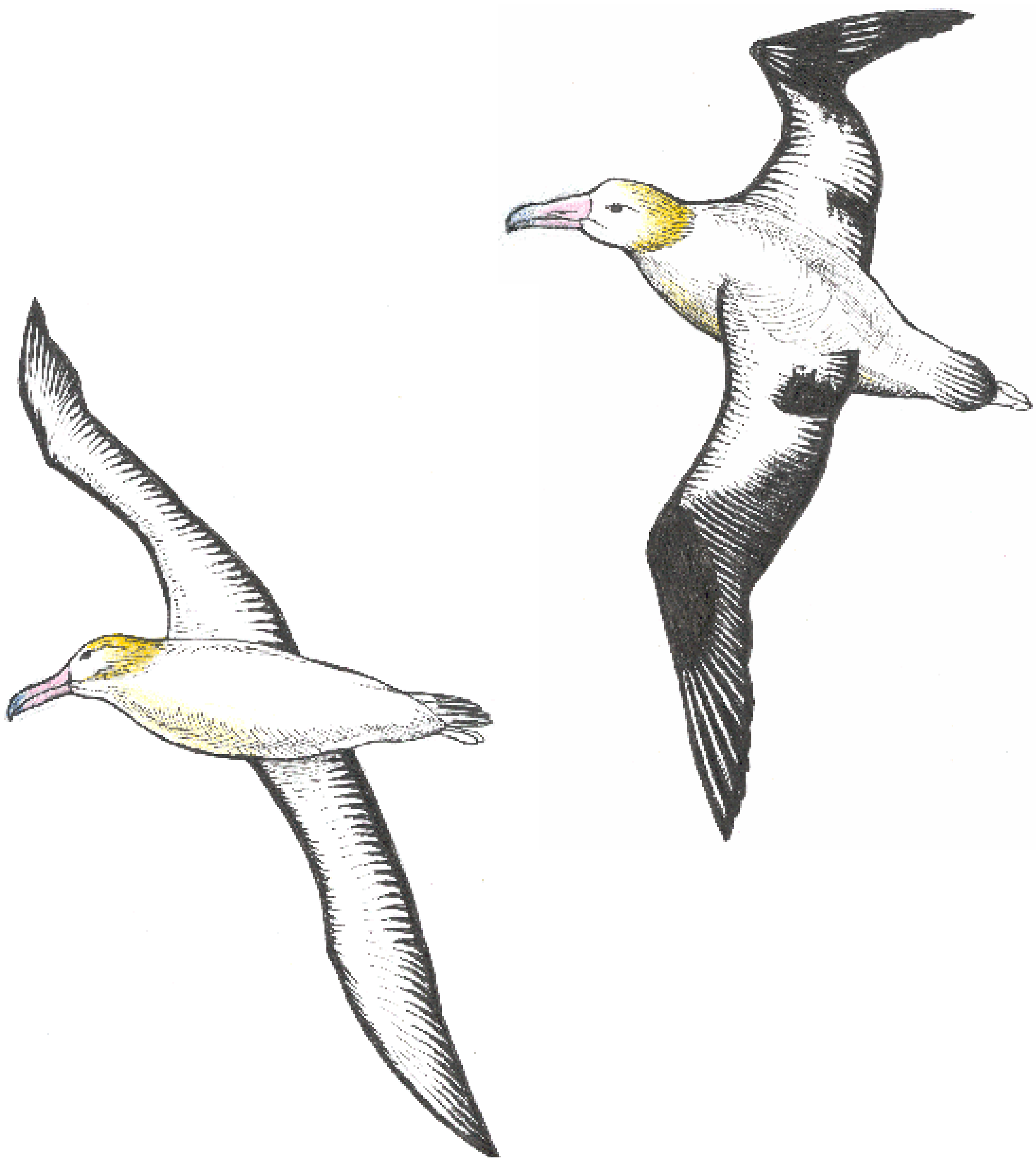
7. ***Eric VanderWerf***
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd., Rm. 3-122
PO Box 50088
Honolulu, HI 96850
Work: 808-792-9400
Fax: 808-792-9581
E-mail: Eric_Vanderwerf@fws.gov

8. ***Holly Freifeld***
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd., Rm. 3-122
PO Box 50088
Honolulu, HI 96850
Work: 808-792-9400
Fax: 808-792-9581
E-mail: Holly_Freifeld@fws.gov

Short-tailed Albatross

Figures for Noting Wounds, Hooks, and Lines

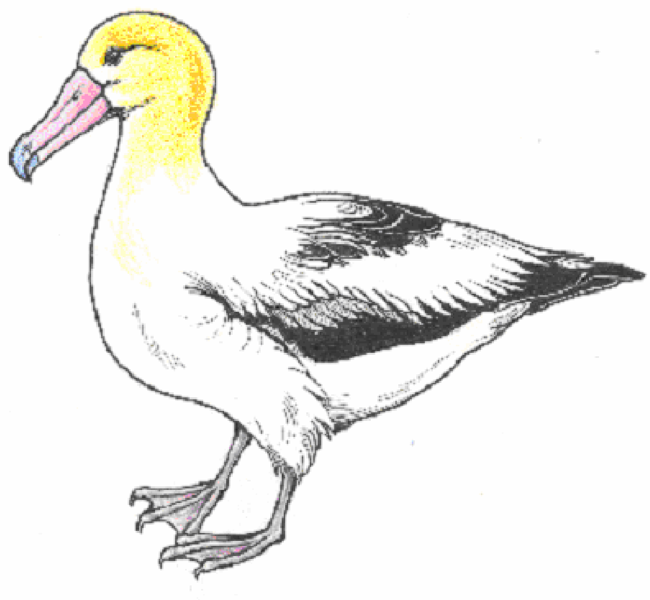
(circle impacted area and provide description)

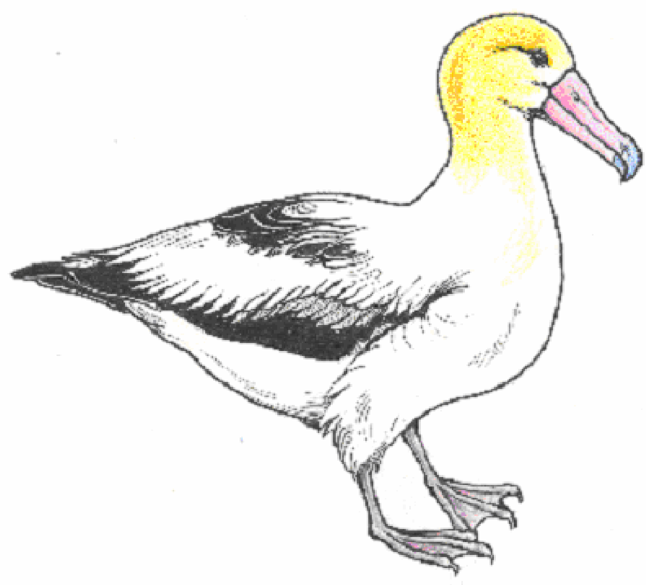


Drawings by Ronald L. Walker

Short-tailed Albatross

Left and Right Side Figures for Noting Wounds, Hooks, and Lines
(circle impacted area and provide description)





Drawings by Ronald L. Walker

<table>
<tr><th colspan="5">SHORT-TAILED ALBATROSS RECOVERY DATA FORM</th></tr>
<tr><th colspan="5">I. CAPTURE INFORMATION:</th></tr>
<tr><td colspan="2">Date:</td><td colspan="2">Time:</td><td rowspan="2">Location:
Latitude =

Longitude =</td></tr>
<tr><td>Trip Number:</td><td colspan="3">Specimen Number:</td></tr>
<tr><td colspan="2">Band Information:
Color:
Number:</td><td colspan="2">Left Leg:</td><td>Right Leg:</td></tr>
<tr><td colspan="5">Bird alive at capture (circle one)? Yes No (If “No”, do not fill out Sections II-V.)</td></tr>
<tr><th colspan="5">II. ASSESS BIRD’S CONDITION:</th></tr>
<tr><td colspan="5">Answer the following questions by placing an X in the yes or no column. If all questions are answered “yes”, the bird may be released following release guidelines as identified in the Handling and Release Guidelines for Short-tailed Albatross.</td></tr>
<tr><th colspan="2">Observation Checklist</th><th>Yes</th><th>No</th><th>Comments</th></tr>
<tr><td colspan="2">1. Can the bird stand and hold head upright?</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">2. Is the bird alert, responsive, aware of surroundings?</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">3. Are the eyes open?</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">4. Does the bird breathe with its bill closed (i.e., no open bill breathing)?</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">5. Does the bird breathe quietly (i.e., no sounds)?</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">6. Is the bird holding its wings in a normal position up and against the body (i.e., not drooping or held down)?</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">7. Can the bird flap its wings?</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">8. Is the bird free from visible damage? (If damaged, the wounds should be noted on bird diagram.)</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">9. Is the bird free from hooks or entangled fishing line? (If bird is hooked or entangled in line, note location on bird diagram)?</td><td></td><td></td><td></td></tr>
</table>

III. TREATMENT		
Note wounds, hooks, and line entanglement on bird diagram.		
Veterinarian Contacted:	Date:	Time:

Date/Time:	***Treatment Administered:***

IV. RECOVERY	
Observation Period (Check bird at 30 minutes, 1 hour, and every few hours thereafter; use more sheets if necessary)	
Date/Time:	***Bird Behavior/Condition:***

V. RELEASE (Note: Follow release criteria and guidelines as identified in the Handling and Release Guidelines for Short-tailed Albatross.)	
Release Date:	Release Time:
Release Location (Lat/Long):	
Bird Behavior Upon Release:	