U.S. Fish and Wildlife Service

Short-Tailed Albatross

Draft Recovery Plan

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Cover photos of Short-Tailed Albatross,
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Short-Tailed Albatross

(*Phoebastria albatrus*)

Draft Recovery Plan

For Public Review

Prepared by the Short-Tailed Albatross Recovery Team for:

Region 7
U.S. Fish and Wildlife Service
Anchorage, Alaska

Approved: - DRAFT -

Regional Director, Alaska Region,
U.S. Fish and Wildlife Service

Date: XX/XX/XX

A Short Primer on Recovery Teams

- A recovery team is a formal advisory group that provides advice on recovery needs and opportunities for species listed as endangered or threatened.
- Recovery teams are not required; they are convened at the discretion of the Regional Director.
- The Service has administrative responsibility for preparing and approving recovery plans.
- The recovery team focuses on recovery plan development and may also be involved with recovery plan implementation.

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Executive Summary

Species' Status

The short-tailed albatross (*Phoebastria albatrus*) was federally listed as endangered throughout its range on July 31, 2000 (65 FR 147:46643-46654). Designation of critical habitat is not prudent for this species.

Prior to its exploitation, the short-tailed albatross was possibly the most abundant of the three North Pacific albatross species. Millions of these birds were harvested by feather hunters prior to and following the turn of the 20th century, resulting in the near-extirpation of the species by the mid-20th century. Presently, fewer than 2000 short-tailed albatrosses are known to exist. The species is known to breed on only two remote islands in the western Pacific. Torishima, where 80 to 85 percent of short-tailed albatrosses breed, is an active volcano, and Tsubame-zaki, the natural colony site on this island, is susceptible to mud slides and erosion. An artificial colony has also been set up in another less erosive location on Torishima (Hatsune-zaki). As of the 2004–05 season, four pairs have nested and fledged chicks at the artificial colony site. The remainder of known short-tailed albatrosses breed at a site in the Senkaku Islands, to the southwest of Torishima, where volcanism is not a threat, but political uncertainty and the potential for oil development exist. The Japanese Government designated the short-tailed albatross as a Natural Monument in 1958 and as a Special Bird for Protection in 1972. Torishima is also a Japanese Natural Monument.

Habitat Requirements and Limiting Factors

Short-tailed albatrosses require remote islands for breeding habitat. These birds nest in open, treeless areas with low, or no, vegetation. Short-tailed albatrosses spend much of their time feeding in shelf-break areas of the Bering Sea, Aleutian chain and in other Alaskan, Japanese and Russian waters, as they require nutrient-rich areas of ocean upwelling for their foraging habitat. The major threat of over-exploitation that led to the species' original endangered status no longer occurs. The primary existing threat to the species' recovery is the possibility of an eruption of Torishima, their main breeding site. A minor eruption occurred there in August of 2002, after the end of the breeding season. Other threats include incidental catch in commercial fisheries, ingestion of plastics, contamination by oil and other pollutants, the potential for competition with non-native species, and adverse effects related to global climate change. These secondary threats will be considered discountable to the recovery of the species if the population is growing at a steady rate, as indicated in the criteria below.

Recovery Criteria

The short-tailed albatross may be reclassified from endangered to threatened when: (1) the total breeding population of short-tailed albatrosses reaches a minimum of 750 pairs; and (2) the 3-year running average growth rate of the population is $\geq$ 6% for $\geq$ 7 years; and (3) at least three successful breeding colonies ($\geq$ 5 breeding pairs each) exist, at least two of which occupy non-volcanic (or extinct volcanic) islands.

The short-tailed albatross may be considered for delisting when: (1) the total breeding population reaches a minimum of 1000 pairs; and (2) the 3-year running average growth rate of the population is 6% for 7 years; and (3) at least 250 breeding pairs exist on at least 2 non-volcanic islands; and (4) a minimum of 10 percent of these (i.e. 25 pairs) occur on a site or sites other than the Senkaku Islands. In addition, a post-delisting monitoring plan and agreement to continue post-delisting monitoring must be in place and ready for implementation at the time of delisting.

Date of Recovery
Assuming new colony establishment is successful, we estimate that the short-tailed albatross may be delisted in the year 2030.

Important Recovery Actions *(for more details see Narrative Outline)*:

1. Continue to monitor population and manage habitat on Torishima.
2. Monitor Senkaku population.
3. Conduct telemetry studies.
4. Establish one or more breeding colonies on non-volcanic islands.
5. Continue research on fisheries operations and mitigation measures.
6. Conduct other research.
7. Conduct other management-related activities.
8. Conduct outreach and international negotiations.

Estimated Cost (U.S. Dollars x 1000): Cost estimates reflect costs for specific actions needed to promote short-tailed albatross conservation. Estimates do not include costs that agencies or other entities normally incur as part of their mission or normal operating expenses. The following table provides cost estimates for recovery actions listed in the Implementation Schedule of this document.

Total Estimated Cost of Recovery ($000's):

Year	Action 1	Action 2	Action 3	Action 4	Action 5	Action 6	Action 7	Action 8	TOTAL
2006	79	90	56	310	50	27	3	10	625
2007	557		289	320	110	47	118	7	1448
2008	45		134	182	175	162	18	17	733
2009	45	50	280	182	70	107	23	14	771
2010	15		55	182	50	72	3	17	394
2011	15			182		2	3	5	207
2012	15	50		182	40	10	3		300
2013	15			50		2		5	72
2014	15			30	40	10	3		98
2015	15	50		30		2		5	102
2016	15			30	20	10	3		78
2017	15			30		2		5	52
2018	15	50		30	10	2	3		110
2019	15			30		2		5	52
2020	15			30	10	2			57
2021	15	50		30		2		5	102
2022	15			30	5	2			52
2023	15			30		2		5	52
2024	15	50		30	5	2			102
2025	15			30		2		5	52
2026	15			30	5	2			52
2027	15	50		30		2		5	102
2028	15				5				20
2029	15							5	20
2030	15				5				20
TOTAL	1041	440	814	2010	600	473	180	115	5673

Contents

SHORT-TAILED ALBATROSS RECOVERY PLAN

Background

STATUS

The short-tailed albatross (*Phoebastria albatrus*) was originally listed in 1970, under the Endangered Species Conservation Act of 1969, prior to the passage of today's Endangered Species Act (35 FR 8495). However, as a result of an administrative error (and not from any biological evaluation of status), the species was listed as endangered throughout its range except within the United States (50 CFR 17.11). On July 31, 2000, this error was corrected when the Service published a final rule listing the short-tailed albatross as endangered throughout its range (65 FR 147:46643–46654). Critical habitat has not been designated for this species. In the 2000 final rule, the Service determined that designation of Critical Habitat is not prudent due to the lack of habitat-related threats to the species within U.S. territory, the lack of specific areas in U.S. jurisdiction that could be identified as meeting the definition of Critical Habitat, and the lack of recognition or educational benefits accruing to the American people as a result of such designation.

DESCRIPTION

The short-tailed albatross (sometimes abbreviated as STAL in this document) is a large pelagic bird with long narrow wings adapted for soaring just above the water surface. The bill, which is disproportionately large compared to the bills of other northern hemisphere albatrosses, is pink and hooked with a thin but conspicuous black line extending around the base, and a bluish tip. Like all birds in the Order Procellariiformes (tube-nosed marine birds), the short-tailed albatross' beak has conspicuous external nostrils.

Of the three species of North Pacific albatrosses, the short-tailed albatross is the largest, with a body length of 33–37 inches (in) (84–94 centimeters (cm)), as compared with body lengths of 31–32 in (79–81 cm) for Laysan (*Phoebastria immutabilis*) and 27–29 in (68–74 cm) for black-footed (*Phoebastria nigripes*) albatrosses. The wingspan of the short-tailed albatross is also the largest of the three species, at 84–90 in (213–229 cm) (Harrison 1985). Short-tailed albatrosses are also the only North Pacific albatross that develops an entirely white back at full maturity. The white heads of both sexes develop a yellow-gold crown and nape over several years. Fledged juveniles are dark brown-black, but soon develop the pale bills and legs that distinguish them from black-footed and Laysan albatrosses (Tuck 1978, Roberson 1980). We believe that all fledglings have developed pink bills by the time they reach Alaskan waters. Bones of short-tailed albatrosses at archeological sites are readily distinguished from those of black-footed and Laysan albatrosses based on size (Porcasi 1999).

TAXONOMY

The type specimen for the species was collected by George Steller during his travels with Commander Bering in Kamchatka, Russia and the Bering Sea in the 1740s. P.S. Pallas described the species as *Diomedea albatrus* in Spicilegia Zoologica in 1769 (American Ornithologists' Union [AOU] 1998). The short-tailed albatross is classified within the family Diomedeidae, in the order Procellariiformes. Following the results of genetic studies by Nunn et al. (1996), the family Diomedeidae was arranged into four genera. The genus *Phoebastria*, North Pacific albatrosses, now includes the short-tailed albatross, Laysan albatross, black-footed albatross, and waved albatross (*P. irrorata*) (AOU 1998). Recent analyses, based on complete nucleotide sequencing of mitochondrial cytochrome *b* gene, confirm this arrangement (Penhallurick and Wink 2004).

HISTORICAL DISTRIBUTION (PRE-EXPLOITATION)

The short-tailed albatross once ranged throughout most of the North Pacific Ocean and Bering Sea. A recent discovery of a fossil breeding site on Bermuda confirms that this species also formerly nested in the North Atlantic during the middle Pleistocene (420–362 thousand years ago) (Olson and Hearty 2003). These authors speculate that short-tailed albatrosses were extirpated from the north Atlantic during an interglacial period in which sea level rose more than 20 meters higher than present, with violent storm surges.

In the North Pacific, short-tailed albatrosses are known to have nested on the following islands: Japan: Torishima in the Seven Islands of Izu; Mukojima, Nishinoshima, Yomeshima, and Kitanoshima in the Bonin Islands; Kita-daitojima, Minami-daitojima, and Okino-daitojima of the Daito group; Senkaku Retto of southern Ryukyu Islands, including Minami-kojima, Kobisho, and Uotsurijima;

Figure 1. Known historic breeding range of short-tailed albatross. Locations in capital letters are currently occupied breeding colonies. (from Tickell 2000)

and Iwo Jima in the western Volcanic Islands (Senkaku-Retto); Taiwan: Agincourt Island (= P'eng-chia-Hsu); and Pescadore Islands, including Byosho Island (Hasegawa 1979, King 1981; see Figure 1). Other undocumented nesting colonies may have existed.

Recent observations, together with records from the 1930s, suggest that the short-tailed albatross may have once nested on Midway Atoll, a complex of islets that includes Sand Islet, Eastern Islet, and Spit Islet, located east of Kure Atoll, at the northwestern end of the Hawaiian Archipelago. Short-tailed albatrosses have been observed on Midway Atoll since the 1930s (Berger 1972, Hadden 1941, Fisher in Tickell 1973, Tickell 1996, Robbins in Hasegawa and DeGange 1982). Although nesting attempts have been observed, there have never been more than two short-tailed albatross individuals reported on the Atoll during the same year, and no successful nesting has been confirmed there. Eggs have been produced, but were likely infertile; none have hatched (B. Flint, U.S. Fish and Wildlife Service, Honolulu, pers. comm. 2002). No historical breeding accounts have been confirmed for Midway Atoll.

Midway Atoll, the only area within U.S. jurisdiction where short-tailed albatross have attempted to nest, is a National Wildlife Refuge, managed by the Service for the conservation of seabirds and other fish and wildlife and their habitats. Approximately 2 million black-footed and Laysan albatrosses nest throughout the islands. Observations of individual short-tailed albatrosses have also been made during the breeding season on Laysan Island, Green Island at Kure Atoll, and French Frigate Shoals, but there is no indication that these occurrences represent established breeding populations (Sekora 1977, Fefer 1989).

Early naturalists believed that short-tailed albatrosses bred in the Aleutian Islands, because high numbers of birds were seen nearshore during the summer and fall months (Yesner 1976). Alaskan Aleut lore referred to local breeding birds, and the explorer Otto Von Kotzebue reported that Natives harvested short-tailed albatross eggs. However, while adult bones were found in Aleut middens, fledgling remains were not recorded in over 400 samples (Yesner 1976). These findings led Yesner (1976) to believe that short-tailed albatrosses did not breed in the Aleutians but were harvested offshore outside of the breeding season. Given the midwinter constraints on breeding at high latitudes and the more southerly location of their known winter breeding areas, it is highly unlikely that short-tailed albatrosses ever bred in Alaska (Sherburne 1993).

Historical information on the species' range away from known breeding areas is scant. Evidence from archeological studies in middens suggests that hunters in kayaks had access to an abundant nearshore supply of short-tailed albatrosses from California north to St. Lawrence Island 4,000 years ago (Howard and Dodson 1933, Yesner and Aigner 1976, Murie 1959). In the 1880s and 1890s, short-tailed albatross abundance and distribution during the non-breeding season was generalized by statements such as "more or less numerous" in the vicinity of the Aleutian Islands (Yesner 1976). The species was reported as highly abundant around Cape Newenham, in western Alaska (DeGange 1981), and Veniaminof (in Gabrielson and Lincoln 1959) regarded them as abundant near the Pribilof Islands. In 1904, they were considered "tolerably common on both coasts of Vancouver Island, but more abundant on the west coast" (Kermode in Campbell et al. 1990).

At-sea sightings since the 1940s indicate that short-tailed albatrosses, while few in number today, are distributed widely throughout their historic foraging range in the temperate and subarctic North Pacific Ocean (Sanger 1972, USFWS unpbl. data). Reported observations are concentrated along the edge of the continental shelf, in the northern Gulf of Alaska, Aleutian Islands, and Bering Sea (McDermond and Morgan 1993, Sherburne 1993, USFWS unpbl. data). Sightings of individual albatrosses have been recorded along the west coast of North America, as far south as the Baja Peninsula, Mexico (Palmer 1962). The Service's short-tailed albatross at-sea sightings database contains many observations of short-tailed albatrosses within 6 miles of shore, and several observations of birds within 3 miles of shore (USFWS unpbl. data). Their presence in nearshore areas may coincide with high biological productivity, such as zones of upwelling along the west coast of North America, the continental shelf break areas in the Bering Sea, and the Aleutian Islands (Hasegawa and DeGange 1982, USFWS unpbl. data).

HISTORICAL POPULATION STATUS

At the beginning of the 20th century, short-tailed albatrosses declined in population numbers to near extinction, primarily as a result of hunting at the breeding colonies in Japan. Albatrosses were killed for their feathers and various other body parts. The down feathers were used for quilts and pillows, and wing and tail feathers were used for writing quills; their bodies were processed into fertilizer, their fat rendered, and their eggs collected for food (Austin 1949). Pre-exploitation worldwide population estimates of short-tailed albatrosses are not known. Dr. Hiroshi Hasegawa estimated at least 300,000 breeding pairs on Torishima alone. The total number of birds harvested provides the best estimate of the pre-exploitation population size, since the harvest nearly drove the species to extinction. Between approximately 1885 and 1903, an estimated five 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 a 1903 volcanic eruption). Even as late as the 1930s, substantial albatross harvest continued. A schoolteacher resident on Torishima reported 3,000 albatrosses killed in December 1932 and January 1933. 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, however, the chief of the weather station at Torishima, Mr. M. Yamamoto, reported nesting of the short-tailed albatross (Tickell 1973, 1975). In January 1951, about 10 short-tailed albatrosses were observed on Torishima (Hasegawa 2001). By 1954 there were 25 birds and at least 6 pairs (Ono 1955). These were presumably birds that had been wandering the North 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 increased. The average recruitment rate of the short-tailed albatross population on the island of Torishima (also referred to as the Tsubame-zaki colony) between 1950 and 1977 was 2.5 adults per year; between 1978 and 1991 the average recruitment rate was 11 adults per year. An annual population growth of 6 to 8 percent per year (Hasegawa 1982, Cochrane and Starfield 1999) has resulted in a continuing increase in the breeding population to an estimated 600 breeding birds on Torishima in 2004–2005 (H. Hasegawa, Toho University, Chiba, Japan, pers. comm. December 2004).

Torishima is an active volcano, approximately 1182 ft (394 m) high and 1.5 mi (3 km) wide (USFWS 2000a) located at 30.48° N and 140.32° E (Simkin and Siebert 1994). Torishima is under Japanese Government ownership and is managed for the conservation of wildlife. Ongoing management efforts focus on maintaining high rates of breeding success. However, the location of this colony, on the fluvial outwash plain of the active volcano's caldera, is precarious. A minor eruption occurred here in 2002, and it is said by Japanese scientists that a major eruption is overdue.

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 revealed an estimated 16 to 35 adults. In April 1988, the first confirmed chicks on Minami-kojima were observed; in March 1991, 10 chicks were observed. In 1991, the estimate for the population on Minami-kojima was 75 birds and 15 breeding pairs (Hasegawa 1991). An estimate of the current population on the Senkakus is presented below. There is no information available on historical numbers at this breeding site.

CURRENT DISTRIBUTION

As of 2005, 80–85% of the known breeding short-tailed albatrosses use a single colony, Tsubame-zaki, on Torishima Island. An artificial colony, dubbed Hatsune-zaki, has been set up on the northwest side of Torishima Island, on a safer, less actively eroding site (Figure 2). A single pair has successfully raised seven chicks there over the past 10 years, and in December of 2004, three additional pairs were observed to have nested. The male of one of these pairs is a 4-year-old bird that itself was hatched at the Hatsune-zaki colony (K. Ozaki, Yamashina Institute for Ornithology, pers. comm. November 2004). Each of the four albatross pairs nesting at Hatsune-zaki fledged a chick in 2005 (K. Ozaki, pers. comm. 2005). This good news indicates that a successful colony is developing at Hatsune-zaki. Additional short-tailed albatrosses have been frequenting this site, often remaining overnight, a fact which holds promise for additional colony growth in the future.

The remaining known breeding birds nest in the Senkaku Island group, with one exception, on Minami-kojima, (Figure 1). In 2002 a short-tailed albatross chick also fledged from Kita-kojima, an island near Minami-kojima. The Senkaku Island chain may be slated for future oil development (BBC 2003).

Since 1938, approximately 50 observations of about 17 different short-tailed albatrosses have been

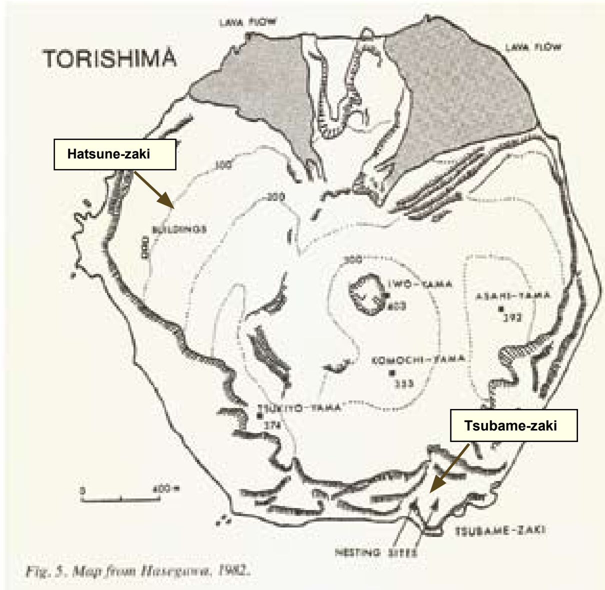

Figure 2. Location of short-tailed albatross breeding sites on Torishima Island. Base map from Hasegawa (1982).

noted in the vicinity of the Northwestern Hawaiian Islands, typically between November and April. Short-tailed albatrosses 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). A single individual short-tailed albatross periodically nests on Midway Island (Figure 3), but is not known to have produced any viable eggs (Beth Flint, USFWS, pers. comm. 2003). No other confirmed records of short-tailed albatross breeding are known from the Hawaiian Islands.

In 2000, a pair of short-tailed albatrosses with an egg were observed on Yomejima, an island within the Mukojima Retto; a group of islands within the Ogasawara Gunto (Bonin Islands) (Asahi Shimbun and Yomiuri Shimbun newspapers, 28 December 2000). The egg did not hatch.

Outside of the breeding season, short-tailed albatrosses are distributed throughout most of the North Pacific (USFWS 2000a). They have been observed most frequently along the continental shelves in the Gulf of Alaska, the Aleutians, and the Bering Sea, between the Alaska Peninsula and St. Matthew Island (USFWS unpbl data, Figure 4). Considerable information has been gained from recent satellite telemetry work on the post-breeding season distribution of short-tailed albatrosses. This work is discussed in further detail under Telemetry below and in Appendix 4.

CURRENT POPULATION STATUS

A wealth of information on short-tailed albatross numbers and productivity at the Tsubame-zaki colony has been collected by Dr. Hiroshi Hasegawa for over 20 years. Population growth rates at Torishima, determined by annual increases in adults observed, eggs laid, and chicks fledged have varied between 6.5% and 8.0% over this period (H. Hasegawa pers. comm. 2003). Based on Dr. Hasegawa's data, Cochrane and Starfield (1999) have estimated annual survival rate of adults at 98% and of post-fledging juvenile/subadults at 94%. P. Sievert (University of Massachusetts, pers. comm. 2003) has estimated the average growth rate of the Senkaku population to be 11 percent (see also Appendix 1).

From these data and models, an estimate of the current world population can be calculated as follows (P. Sievert pers. comm. 2005):

- Approximately 50% of the STAL population are subadults (fledglings and birds 1–5 years of age), as concluded from life table analyses.
- The number of nests on Torishima in 2004–05 was 302.
- Assuming that about 80% of the breeding-age birds actually nest in a given year (H. Hasegawa pers. comm. 2003), the total number of breeding pairs in the Torishima population would be 378 (302/0.80), and the total number of breeding birds in the Torishima population would be 756 (378 x 2).

Figure 3. Short-tailed albatross with egg (likely infertile) on Yomejima Island, Mukojima Island Group in the Bonin Islands, 2001.

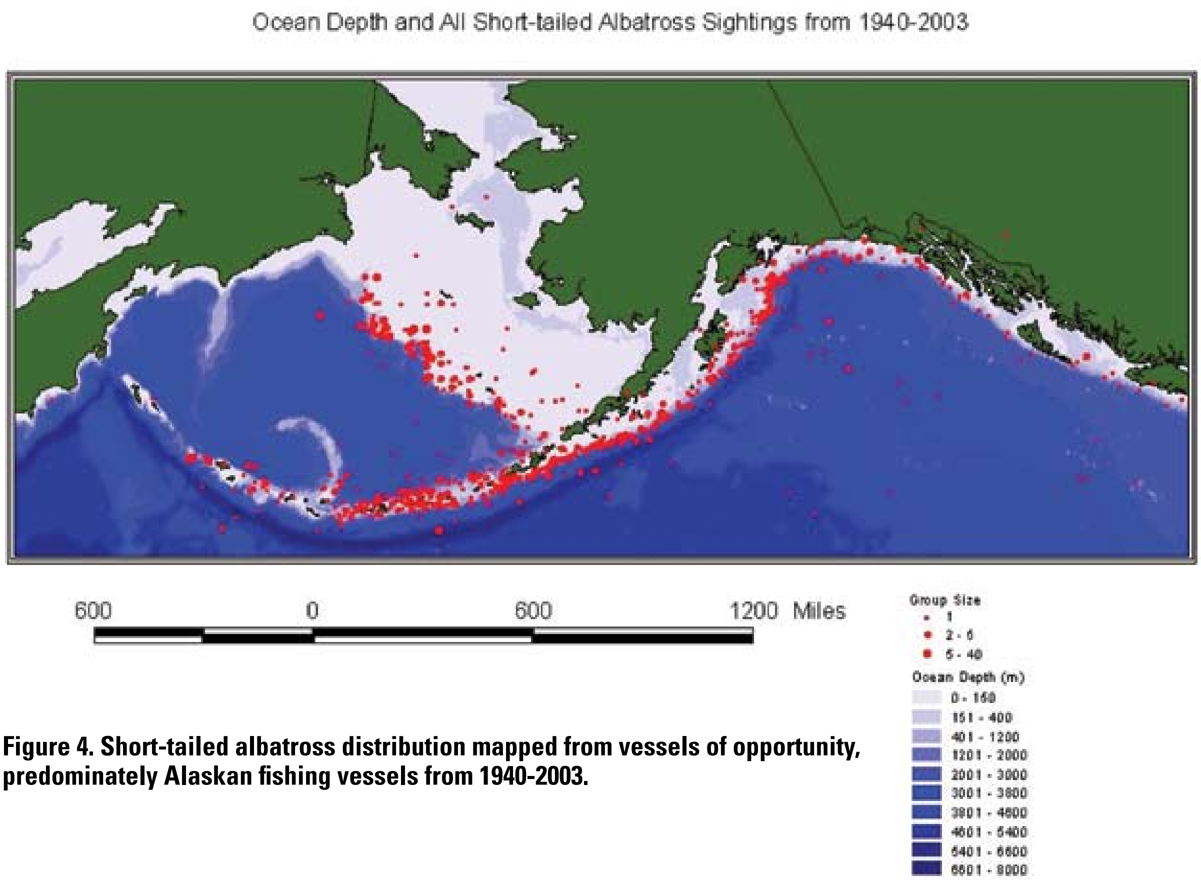

Figure 4. Short-tailed albatross distribution mapped from vessels of opportunity, predominately Alaskan fishing vessels from 1940-2003.

- In the 2005–06 season, approximately 50 new pairs, or 100 breeding individuals, will be added to the population (subadults turning into breeding adults as calculated from life table analyses) at Torishima so the total population size there will be the sum of the number of breeding birds, 856 (756 + 100), and the number of subadults, 856 (about the same number as breeders), for a total of 1712 birds in the Torishima population.
- For the Senkakus, based on Dr. Hasegawa's estimate of 60 pairs in 2004–05 (H. Hasegawa pers. comm. 2005), the total number of pairs in that population is 75 (again assuming 80% of pairs nest in a given year, 60/0.80 = 75), for a total of 150 breeding-age birds (75 x 2) starting the 2004–05 nesting season.
- About 10 new pairs will be added to the Senkaku breeding population in 2005–06 (from life table calculations), resulting in an estimated 85 breeding pairs or 170 breeding individuals in the Senkakus.
- Assuming that the subadult portion of the population comprises about 50% of the total population, we can estimate that at the start of the 2005–06 breeding season, the total number of individuals in the Senkaku population is 340 individuals.
- Based on the above calculations, we estimate the world population of short-tailed albatrosses in the fall of 2005 at about 513 pairs (428 from Torishima and 85 from the Senkakus), or 2,052 individual birds (1,712 from Torishima and 340 from the Senkakus).
- In round numbers, we estimate the world population of short-tailed albatrosses at the start of the 2005–06 breeding season at about 500 breeding pairs, or 2,000 individual birds.

Population data for know short-tailed albatross colonies are show in Table 1 and Figure 5.

LIFE HISTORY

Breeding Biology

At the Tsubame-zaki colony, birds arrive and begin nest building in October. Nests consist of a divot on the ground lined with sand and vegetation. Tickell (1975) describes the nest as a grass or moss-lined concave scoop about 2 feet (ft) (0.61 meter [m]) in diameter.

Egg-laying begins in late October and continues through late November. The female lays a single egg. Incubation involves both parents and lasts 64 to 65 days. The parents alternate foraging trips that may last 2–3 weeks while taking turns incubating.

Table 1. Short-tailed Albatross productivity data on Torishima and Minami-kojima

Nesting Season	No. of birds seen (except chicks)	No. of eggs laid	No. of chicks reared	% Fledging success	Chicks reared at Minami-kojima
1987–88					7
1990–91					10
1991–92					11
1994–95	324	153	82	54%	
1995–96	337	158	62	39%	
1996–97	349	176	90	51%	
1997–98	403	194	130	67%	
1998–99	394	213	143	67%	
1999–00	380	220	148	67%	
2000–01	420	238	173	73%	24
2001–02	481	251	161	64%	33
2002–03	569	267	171	64%	
2003–04	603	277	193	70%	
2004–05		302	151*	50%	

*High winds blowing sand reduced success in part of Tsubame-zaki

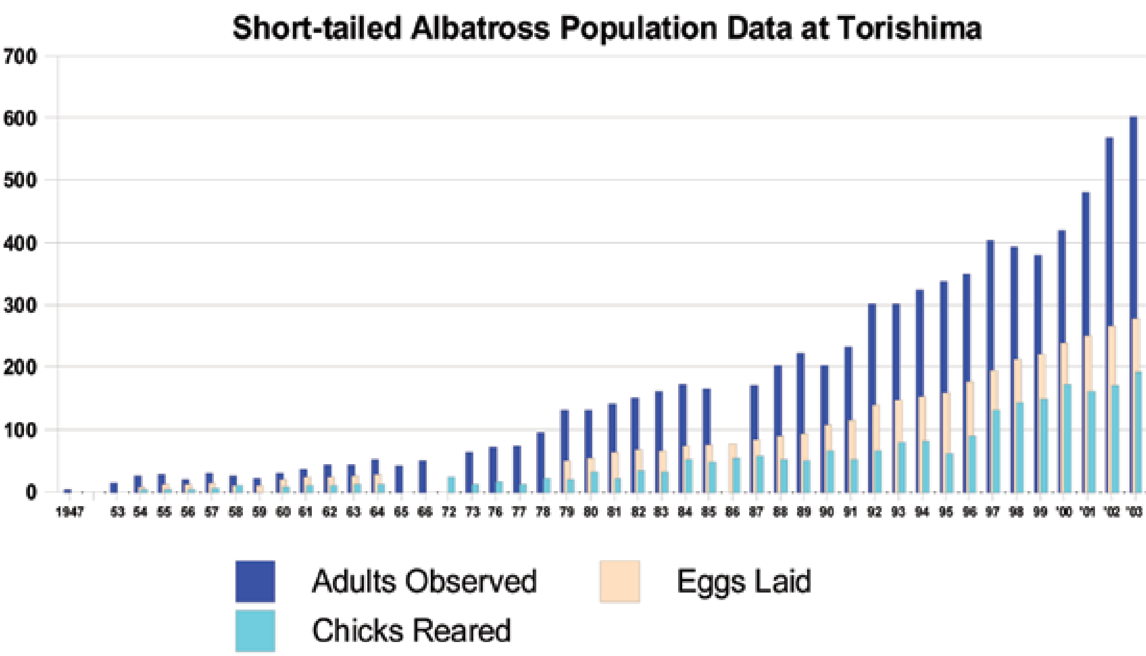

Figure 5. Population performance of short-tailed albatross on Torishima Island, Japan, 1953 to 2002. Numbers indicate year nesting was initiated – Nesting season spans two calendar years.

When one bird is foraging, the other stays on the nest without eating or drinking. Sato et al. (2001) observed 24 days to be the longest period between nest exchanges of a single observed pair.

Eggs hatch in late December and January. For the first few days after hatching the chick is fed on stomach oil, a heavy oil, very rich in calories and Vitamin A, which helps the chick to survive times when food is scarce or the adults are away from the nest for long periods. This oil also provides a source of water once metabolized, which is important when chicks may be left for several days in high temperatures on dry, sandy islands. Soon adults start to bring solid food, such as squid and flying fish eggs. The energy requirement of the chick is greatest during the first few weeks after hatching, during which time one adult broods the chick and the other forages at sea. Later, when the chick can regulate its body temperature, both parents are able to leave their chick to forage. This is considered the "post-guard" stage.

By late May or early June, the chicks are almost full grown, and the adults begin abandoning the colony site (Hasegawa and DeGange 1982). The chicks fledge soon after the adults leave the colony, and by mid-July, the breeding colony is empty (Austin 1949). Non-breeders and failed breeders disperse earlier from the breeding colony, during late winter through spring (Hasegawa and DeGange 1982). There is no detailed information on timing of breeding on Minami-kojima, but it is probably similar to that on Torishima.

Short-tailed albatrosses are monogamous for life and highly philopatric to nesting areas (returning to the same breeding site year after year). Chicks hatched at Torishima return there to breed. However, young birds may occasionally disperse from their natal colonies to breed elsewhere, as evidenced by the appearance of adult birds on Midway Atoll that were banded as chicks on Torishima (H. Hasegawa pers. comm. 1997; Richardson 1994).

From December through April, short-tailed albatrosses congregate near the breeding colonies (McDermond and Morgan 1993). However, if short-tailed albatross behavior is similar to that of black-footed and Laysan albatrosses, their foraging trips may extend hundreds of miles or more from the colony sites. Recent satellite tracking of black-footed and Laysan albatrosses revealed that individuals of these species may forage hundreds of miles from the breeding colonies during the breeding season (Fernandez et al. 2001). In summer (the nonbreeding season), short-tailed albatrosses disperse widely throughout the temperate and subarctic North Pacific Ocean (Sanger 1972; R. Suryan, Oregon State University, pers. comm. 2003).

Breeding Habitat

Short-tailed albatrosses nest on isolated windswept offshore islands, with restricted human access. Nest sites may be flat or sloped, with sparse or full vegetation (Aronoff 1960, Sherburne 1993, DeGange 1981). On Torishima, the birds currently nest on steep sites, on soils containing loose volcanic ash. This choice of nest site may simply be an artifact of where commercial harvest did not occur, due to difficulty of access for humans. The island is dominated by a clump-forming grass, *Miscanthus sinensis* var. *condensatus*. The grass helps to stabilize the soil, provide protection from weather, and minimize mutual interference between nesting pairs while allowing for safe, open takeoffs and landings (Hasegawa 1977). A tansy-like composite, gold-and-silver chrysanthemum (*Chrysanthemum pacificum*), and a nettle, *Boehmeria biloba*, are also present (Hasegawa 1977).

Marine Habitat

The North Pacific marine environment most intensively used by short-tailed albatrosses for feeding is characterized by regions of upwelling and high productivity along the northern edge of the Gulf of Alaska, along the Aleutian Chain, and along the Bering Sea shelf break from the Alaska Peninsula out towards St. Matthew Island (USFWS unpbl. data, 2003). At the shelf breaks in these areas, there is a "greenbelt" of high chlorophyll concentration and primary productivity. The interaction of strong tidal currents, with the abrupt, steep shelf break, promotes upwelling that brings nutrients near to the surface. As a result, primary production remains elevated throughout summer (Coachman 1986). The prolonged blooming period promotes biomass production of large, oceanic copepods and other zooplankton that are critical prey of the abundant stocks of marine fishes, birds and mammals in the Bering Sea (Springer et al. 1996).

Bohmeria biloba

Chrysanthemum pacificum

Although short-tailed albatrosses have been observed in less productive waters far from regions of upwelling, the paucity of observations in these areas suggests that these birds may be simply moving between areas of favored habitat. This notion seems to be supported by satellite telemetry data (USFWS unpbl. data; R. Suryan, Oregon State University, pers comm. 2004).

Diet

The diet of short-tailed albatrosses is not well-known, but observations of food brought to nestlings (Hasegawa unpbl. data) and of regurgitated material (Hattori, in Austin 1949) have indicated that the diet includes squid (in particular, *Ommastrephes sloani*), shrimp, miscellaneous fish, flying fish eggs, and other crustaceans. A systematic study of the diets of nine albatross species (not including short-tailed) confirmed these prey classes and also noted the inclusion of offal, including marine mammal skin and blubber, in the albatross diet (Cherel and Klages 1998). These authors note that there is a partitioning of food resources among sympatric albatross species, with a broad overlap in prey classes, but differences in the proportion of prey taken. Therefore, it is likely that the diet items they note for Laysan and black-footed albatrosses are similar in composition, if not in proportion, to those taken by short-tailed albatrosses.

In February 2004, researchers from the Yamashina Institute observed rafts of short-tailed albatrosses off Tsubame-zaki feasting on what was likely dead giant squid tissue (2 m by 2 m in size). These researchers have also observed that generally in May, many chicks and adults regurgitate small squid and squid beaks (N. Nakamura, pers. comm. 2005). Rafts of short-tailed albatrosses, possibly feeding aggregations, have also been observed in the northern Bering Sea (Figure 6).

Figure 6. Portion of a flock of short-tailed albatrosses observed in the northern Bering Sea west of St. Mathew Island along the U.S.- Russia border adjacent to the "donut hole." There were at least 97 short-tailed albatrosses in this flock. (Photo by Josh Hawthorne of F/V Blue Gadus)

Giant squid netted off the U.K. coast, BBC News, January 14, 2002

Demography

Short-tailed albatrosses are long-lived and slow to mature; the average age at first breeding is 5 or, more commonly, 6 years (H. Hasegawa pers. comm. 2002). As many as 25 percent of breeding age adults may not return to the colony in a given year (H. Hasegawa pers. comm. 2002). Females lay a single egg each year, which is not replaced if destroyed (Austin 1949). Survival rates for all adults and post-fledging juvenile/subadults combined are high (96 percent; H. Hasegawa pers. comm. 2002). Actual juvenile survival rates are unknown, but are probably lower than those of adults. Cochrane and Starfield (1999) assume a juvenile/subadult survival rate of 94 percent. Breeding success (the percent of eggs laid that result in a fledged chick) has varied between approximately 60 and 70 percent in recent years (see Table 1). Low breeding success would be likely in years when catastrophic volcanic or weather events occur during the breeding season.

Some mariners believe that one or more additional short-tailed albatross breeding colonies may exist, because they see so many unbanded birds, despite the fact that Hasegawa has made a concerted effort to band every chick on Torishima for over 20 years. However, the bands are quite hard to see and are often not visible until the birds are in hand. Also, not all of the short-tailed albatross chicks at Minami-kojima have been banded. It is worth noting that all short-tailed albatrosses accidentally caught in the Alaskan longline fishery have had bands.

CURRENT THREATS

The activity that led to the endangerment of short-tailed albatrosses (i.e., massive-scale hunting) no longer occurs. However, a number of other factors currently threaten the species' continued existence, especially in light of its depleted status and limited breeding distribution. Discussion of threats was covered in detail at the first meeting of the Short-tailed Albatross Recovery Team (START) in November 2002. The threat factors discussed and categorized at that meeting are presented in Table 3. Threats considered note worthy are described below.

Catastrophic Events — Habitat Alteration and Loss

Significant loss of breeding habitat or breeding adults at the Tsubame-zaki colony would delay and possibly preclude recovery of the species. 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.

Volcanic Activity

Habitat destruction from volcanic eruptions poses a significant threat to short-tailed albatrosses at the primary breeding colony on Torishima. The threat is not predictable in time or magnitude; eruptions could be catastrophic or minor, and could occur at any time of year.

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 five formally recorded eruption events, as follows:

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 occurred.
4. On October 2, 1975, a submarine eruption was recorded 4.4 nautical miles (9 km) south of Torishima (Simkin and Siebert 1994).
5. On August 11, 2002, a minor eruption sent ash plumes up to 5000 feet, but caused no vegetation or landscape changes. This eruption is not likely to have caused much, if any, albatross mortality, since it occurred outside the main breeding season (December to April).

The literature also refers to an eruption in 1940, which resulted in lava flow that filled the island's only suitable anchorage. Austin (1949) visited the waters around Torishima 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' that 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.*

A catastrophic volcanic eruption during the breeding season could result in chick and adult mortalities as well as destruction of nesting habitat. A worst-case-scenario single volcanic event is predicted to result in the loss of 40% of the short-tailed albatross world population, with additional loss in productivity due to disruption of breeding pair bonds (Paul Sievert pers comm. 2004). However, non-breeding adult and immature birds that remain at sea year round serve as an "extinction buffer." An estimated 20–25 percent of breeding age adults do not return to breed each year, and immature birds do not return to the colony to breed until at least 5 years after fledging (a life history feature that may have saved the species from total extermination during the feather-hunting days). Over 50 percent of the 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.

Monsoon Rains

The eruptions in 1902 and 1939 destroyed much of the original breeding habitat. The remaining site used by albatrosses is on a sparsely vegetated steep slope of loose volcanic soil. Monsoon rains that occur on the island result in frequent mud slides and severe erosion, which can cause habitat loss, nest destruction, and chick mortality. In 1987, a landslide occurred on the nesting slope at Tsubame-zaki, and subsequent mud flows reduced the short-tailed albatrosses' breeding success to less than 50% that year (Hasegawa 2001). 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 are at greater risk of mortality from monsoon rains, erosion, slides, sand storms and wind (H. Hasegawa, pers. comm. 1997). Breeding success at Tsubame-zaki is lower in years when there are significant typhoons (USFWS 2000a).

Global Changes

Climate Change

According to the recently published report, "Impacts of a Warming Arctic" (ACIA 2004), the Arctic is now experiencing some of the most rapid and severe climate change on Earth. In the past few decades, average arctic temperature has risen at almost twice the rate of temperatures in the rest of the world. Arctic warming has been accompanied by widespread melting of glaciers and sea ice and rising permafrost temperatures. Increases in glacial melt and river runoff add more fresh water to the ocean, raising global sea level and possibly altering the ocean circulation and patterns of upwelling. Perturbations of these oceanic parameters may affect the availability of food for the short-tailed albatross and other marine birds. Climate changes may also affect vegetation and other characteristics of short-tailed albatross breeding colony sites. An acceleration of these climatic trends is projected to occur during this century, due to ongoing increases in concentrations of greenhouse gases in the earth's atmosphere (ACIA 2004).

Ocean Regime Shift

Indices of climate-ocean conditions indicate that "regime shifts" in atmospheric sea level pressure and upper ocean temperature structure have occurred in the North Pacific in 1925, 1947, 1977, 1989 and possibly 1998 (Benson and Trites 2002), affecting the ocean's thermal structure from 60˚S to 70˚N (Stephens et al. 2001). Such large-scale changes suggest that an as yet unidentified common, global event may be responsible for the shift. It appears that changes in atmospheric pressure alter wind patterns. These wind patterns affect oceanic circulation and physical properties, such as salinity and depth of the thermocline. These physical properties affect primary and secondary production, which in turn affects the higher trophic levels, such as fish and marine birds and mammals. Regional ocean regime shifts may have positive or negative effects on the abundance of marine organisms, depending on the species in question and the magnitude and direction of the changes (Benson and Trites 2002). This natural factor should be kept in mind as a potential source of variation in albatross population dynamics over the long term.

Commercial Fishing

Longline fisheries, both demersal (gear on or near bottom) and pelagic (gear set closer to the surface), in the North Pacific Ocean (including the Bering Sea and Gulf of Alaska) are known to pose a risk to short-tailed albatrosses. Seabirds, including albatrosses, attempt to steal bait as the hooks are deployed into the water. If birds are hooked or snagged, they can be pulled underwater with the groundline and drown. An estimated average of 221 black-footed albatrosses and 664 Laysan albatrosses were taken annually in Alaska demersal longline fisheries during 1993 to 2001 (NPFMC 2002). All reported longline takes of short-tailed albatrosses in Alaska have occurred on demersal gear.

Demersal Groundfish Longline Fisheries in Alaska

United States-based demersal groundfish longline fisheries in Alaska are monitored by fishery observers, who collect data on incidental catch of seabirds, including short-tailed albatross. Reports of short-tailed albatross takes are also occasionally received directly from fishermen. There were two reported fishery-related takes of short-tailed albatrosses in the 1980s. The first bird was found dead in a fish net north of St. Matthew Island in July 1983. The second bird was taken in October, 1987, by a halibut vessel in the Gulf of Alaska. Both takes were reported by fishermen. Since 1990 fisheries observers have reported five short-tailed albatross takes in Alaska's fisheries (Table 2). All known takes occurred in demersal longline groundfish fisheries; none has been reported in groundfish trawl or pot fisheries. Although fisheries-related take of short-tailed albatross has also occurred in the Gulf of Alaska, all take in the observed sample has occurred in the Bering Sea (Table 2).

According to the most recent regulations (NMFS 2004b), only the largest groundfish vessels (over 124 feet length overall) have observers for 100% of their fishing days. Medium vessels (60 to 124 foot length overall) have observers on board for 30% of their trips in each calendar quarter. Smaller groundfish vessels (less than 60 ft length overall) and all Pacific halibut longline vessels have no observer requirements. About 21% to 25% of the hooks are monitored in the Bering Sea demersal groundfish longline fishery while 7 to 13% of Gulf of Alaska hooks are monitored (excluding the halibut and state-managed inshore fisheries) (NPFMC 2002). Fishery observers use sampling schemes to subsample the total number of hooks set. The observed take events can then be extrapolated to provide an estimated number of takes for the entire fishery. Two separate analyses for the demersal groundfish longline fisheries estimate that, on average, one short-tailed albatross is taken in the Bering Sea hook-and-line fishery each year (Stehn et al. 2001).

In 2001, the North Pacific Fishery Management Council (the body overseeing fisheries management in the region) unanimously approved recommended changes to the existing regulations for seabird avoidance measures required in the groundfish and halibut fisheries off Alaska. These changes, designed to address the seabird incidental catch issue, 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. Final regulations incorporating these recommendations became effective in February 2004 (69 FR 1930–1951, NMFS 2004b).

Table 2. Date and description of known short-tailed albatross mortalities associated with North Pacific fishing activities since 1990.

Date	Incident
Aug 28, 1995	Juvenile STAL taken in the Individual Fishing Quota sablefish fishery in the western Gulf of Alaska south of the Krenitzin Islands. Bird was not in the observed sample.
Oct 8, 1995	STAL taken in the Bering Sea IFQ hook-and-line fishery. Bird was not in the observed sample.
Sept 27, 1996	5-year-old STAL taken in the Bering Sea hook-and-line fishery. Bird was in the observed sample.
Sept 21, 1998	8-year-old bird taken in the cod hook-and-line fishery in the Bering Sea. Bird was in the observed sample.
Sept 28, 1998	Subadult bird taken in the cod hook-and-line fishery in the Bering Sea. Bird was in the observed sample.
Aug 29, 2003	3-year-old sub-adult bird taken in Russian longline fishery in Bering Sea.

Pelagic Longline Fishing in the U.S.

U.S.-based pelagic longline swordfish and tuna fisheries in the vicinity of the Hawaiian Islands also have the potential to affect short-tailed albatrosses. The amount and likelihood of take in these fisheries is difficult to determine because of the low rate of observer coverage. NMFS observer records from 1994 to 2000 (based on 4% observer coverage) estimate take of 1,380 black-footed albatrosses and 1,163 Laysan albatrosses per year. No takes of short-tailed albatrosses in any U.S.-based pelagic fishery have been reported. In 2001, observer requirement in the tuna fleet was increased to 20% coverage, and has actually exceeded this amount: 22.5% in 2001, 24.6% in 2002, and 22.2% in 2003 (NMFS 2004a).

The Hawaii-based swordfish longline fishery, which was responsible for the majority of seabird incidental catch (USFWS 2000b), was closed by court order in 2001, due to concerns over incidental catch of sea turtles. Seabird incidental catch decreased significantly with the fishery closure. The swordfish fishery based in Hawaii was reopened on a limited basis in 2004, with a requirement to conduct sets beginning no earlier than one hour after local sunset and ending no later than one hour before local sunrise, and to include 100% observer coverage. In addition, all swordfish-target sets are to use thawed and blue-dyed bait. The Western Pacific Fishery Management Council is reviewing the existing seabird deterrent regulations, and certain changes to these requirements may be recommended to NMFS. The Service has recently completed consultation with NMFS on the reopened shallow-set pelagic fishery on the short-tailed albatross (USFWS 2004).

The Hawaii-based tuna, or deep-set pelagic longline, fishing vessels are not required to use any seabird deterrents when fishing south of 23˚N latitude, generally south of the southernmost short-tailed albatross observations in Hawaii. When fishing north of 23˚N latitude, these vessels are required to use a line-setting machine, minimum 45-g weights on branch lines, thawed and blue-dyed bait, and strategic offal discharge (H. Freifeld, U.S. Fish and Wildlife Service, Pacific Islands Ecological Services Office, pers. comm. 2004). Preliminary satellite telemetry information suggests that the waters exploited by these fisheries are not commonly used by short-tailed albatross (R. Suryan, Oregon State University, pers. comm. March 2004). Our database of opportunistic short-tailed albatross sightings from 1942 to present supports this observation (USFWS unpbl. data).

Trawl Fishing in the U.S.

U.S.-based trawl fisheries also have the potential to affect albatrosses. In some trawl fisheries, sonar equipment mounted on the trawl net transmits sonar data to the vessel via a “third wire” or “net sonde” cable. Seabirds attracted to offal and discards from trawl vessels may either strike the hard-to-see cable while in flight, or get caught and tangled in the cable while they sit on the water. In some southern hemisphere fisheries, most notably in the CCAMLR (Commission for the Conservation of Antarctic Marine Living Resources) area, outboard transducer and third wire cables have been outlawed for a number of years, due to bird collision problems, and have been replaced by wireless (through-the-hull) transducers. (Bartle 1991, Weimerskirch et al. 2000).

Fishers in the North Pacific have expressed reluctance in embracing wireless sonar technology in their trawl fisheries. Hard-wired sonar reportedly does a better job at accurately transmitting information on catch in the net, location of the net relative to the bottom and surface, and schools of fish in front of the net.

Even the wireless sonar systems have not eliminated the seabird-trawler collision problem. A recent report from the southern hemisphere indicates that a 30- to 40-vessel trawl fishery around the Falkland Islands resulted in take of approximately 900 albatrosses between mid-September and late December 2002 (Graham Robertson, Australian Antarctic Division, pers. comm. 2002). These birds were killed from collisions not with third wires, but with the larger diameter (more visible) warp cables running to the trawl doors. We are currently (as of 2005) investigating the possibility of seabird collisions with U.S.-based trawl fishing gear, both with third wires and with warp cables (see Current Research and Recovery Actions, below).

Non-U.S. Fishing Operations

Understanding the non-U.S. fishing effort in the North Pacific is an integral part of analyzing the global threat of commercial fishing activities 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 the potential threat posed by many fisheries. In the northwestern Pacific Ocean, longline fishing is known to be conducted by vessels from Taiwan, China, Japan, the Republic of Korea, and Russia. Distant water longline fleets, such as those from the U.S., Japan, Russia, Korea, and Taiwan, fish for swordfish and tuna throughout the North Pacific Ocean. In most fisheries, fishermen are not required to report seabird incidental catch, may not be able to identify seabirds, or may have significant disincentives to do so.

The Japanese longline fishing effort in many instances overlaps with the short-tailed albatross foraging range. The Government of Japan has issued special fishing gear restrictions applicable to a 20-nautical mile area around Torishima, to protect short-tailed albatrosses during the main breeding season (see below and Appendix 7).

We do have two reports of short-tailed albatross interactions with foreign fishing vessels. Hasegawa (pers. comm. 2002) noted that a short-tailed albatross was hooked by a Japanese vessel jig fishing for bonito in 1986, but the bird was released alive. We also have a report of a subadult short-tailed albatross (originally marked on Torishima in 2000) that was taken by a Russian longliner in the western Bering Sea in August of 2003 (M. Williams, World Wildlife Fund, pers. comm. 2003).

Fishing vs. Albatross Food Supply

In analyzing the effects of commercial fisheries on short-tailed albatross, we must consider whether such fishing might result in adverse effects through a reduction of the species' food supply. For example, survival of Magellanic penguin (*Spheniscus magellanicus*) chicks in the Falkland Islands, (where commercial fishing is allowed within the species' foraging range) is 0.7 chicks per nest, as compared with 1.4 chicks per nest on Magdalena, where a buffer to commercial fishing is maintained in the colony vicinity (International Penguin Conservation web site – http://www.penguins.cl). This impact of fisheries to reproductive success is likely heightened for flightless species, such as penguins, whose potential foraging distance from the colony area is limited.

The effects of commercial longline and trawl fishing on the forage base of the short-tailed albatross are considered discountable, for a number of reasons. First, the albatross are very strong and wide-ranging fliers, not restricted to a limited foraging area. Second, the albatross' diet is believed to consist primarily of squid, shrimp, and other crustaceans. Demersal and pelagic longline and trawl fisheries in the North Pacific do not target or significantly catch these species. Third, the short-tailed albatross population represents such a small fraction of historical levels that intra-specific resource competition is unlikely to come into play in the foreseeable future. Finally, the high population growth rate and fledgling survival rate that short-tailed albatrosses are currently experiencing indicate that the species is not food-limited during the energetically-demanding reproductive period or at other times throughout the year.

Contaminants

Environmental contaminants are known to adversely affect birds (for reviews see Beyer et al. 1996, Fairbrother et al. 1996, Giesy et al. 2003). Briefly, the effects of contaminants can include impaired reproduction, decreased immune function, inability to thermoregulate, disrupted endocrine balance, genetic mutations, and direct mortality. A number of studies have measured contaminant concentrations in tissues of Laysan and black-footed albatrosses (Auman 1994, Auman et al. 1997, Burger and Gochfeld 2000, Fry et al. 1987, Gurge et al. 2000, Sievert and Sileo 1993). Fewer studies have investigated the behavioral and physiological effects of contaminant loads in these albatrosses (Sievert and Sileo 1993, Auman 1994, Finklestein 2003). Published literature documenting contaminant concentrations in short-tailed albatross tissues is more limited (Ikemoto et al. 2003, Nakanishi et al. 2003), and no studies have investigated the effects of sublethal exposure to contaminants in this species.

Metals, Pesticides and PCBs

Albatrosses and other birds may be exposed to organochlorine contaminants such as polychlorinated biphenyls (PCBs) and pesticides, and to toxic metals (e.g., mercury, lead) via atmospheric and oceanic transport. Uptake of these toxins through the food chain may affect these birds throughout their growth and development.

Tanabe et al. (2004) measured dioxins, furans and PCB congeners in five species of albatross from the North Pacific and Southern Oceans. North Pacific species (black-footed and Laysan) had higher concentrations of several dioxin and furan compounds than species from the Southern Oceans. Previous studies by these same researchers indicated that concentrations of PCBs and organochlorine pesticides (e.g., DDTs, HCHs) were also higher in North Pacific albatrosses. Auman et al. (1997) measured concentrations of PCBs and organochlorine insecticides in chick and adult plasma and in eggs of Laysan and black-footed albatrosses on Sand Island, Midway Atoll. Concentrations of DDE in Laysan albatross eggs were found to be well below the threshold for eggshell thinning, but were approximately one-half of the threshold concentrations necessary for eggshell thinning in black-footed albatross eggs. These researchers also found PCB concentrations near levels that could be having subtle population-level effects in black-footed, but not in Laysan, albatrosses.

Nakanishi et al. (2003) analyzed persistent organochlorine pollutants (POPs) in eggs, pectoral muscles, and stomach oil of short-tailed and black-footed albatrosses from Torishima. They detected polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) in all the samples they analyzed. Concentrations of both PCDDs and PCDFs were higher in black-footed albatross eggs and muscle tissue than in short-tailed albatross samples. Overall, residue levels of POPs in albatross eggs from Torishima were higher than those of other offshore bird species from the northern hemisphere. Concentrations of p,p-DDE were within the range that causes eggshell thinning in other bird species; however, the sample size was inadequate to consider the effects of this chemical on short-tailed albatross reproductive success. At present, there is no evidence that short-tailed albatross reproductive success is compromised; however, eggshell thickness and contaminant levels should be monitored on an "as available" basis to detect any potential future effects.

High concentrations of lead have been measured in local populations of Laysan albatrosses. Finkelstein et al. (2003) demonstrated elevated lead concentrations in the blood of Laysan chicks nesting near buildings with lead-based paint on Midway Island National Wildlife Refuge. High lead concentrations in some of these chicks caused damage to their peripheral nervous systems, visible as "droopwing," a symptom of lead poisoning which affects wing muscle control. Chicks with droopwing are doomed to starvation because they can't fly.

No published literature documents concentrations of metals or trace elements in short-tailed albatross tissues. However, in 2002, a few blood and feather samples were collected from short-tailed albatrosses during telemetry work in the Bering Sea. Results and interpretation of trace element and metal analyses for these samples are pending (K. Trust, USFWS, pers. comm. 2004).

Oil

Oil contamination can harm short-tailed albatrosses either through direct toxicity or by interfering with the birds' ability to thermoregulate. Adverse effects of petroleum on marine birds and their prey are widely known (Yamato et al. 1996, Glegg et al. 1999, Trust et al. 2000, Esler et al. 2000, Custer et al. 2000), and petroleum products released into the marine environment can remain for years (Hayes and Michel 1999). Petroleum may: (1) compromise seabirds' thermoregulation through fouling of feathers; (2) cause direct toxicity through ingestion (e.g., during preening); (3) contaminate the birds' food resources; (4) reduce prey availability from toxic effects on prey species; and (5) oil eggs, resulting in suffocation or embryotoxic effects.

Documenting the effects of petroleum exposure on avian species in the wild is difficult. However, Custer et al. (2000) reported changes in enzyme induction and somatic chromosomal damage in sea ducks after exposure to petroleum hydrocarbons. Additionally, Trust et al. (2000) found physiological and potential population-level effects on sea ducks from residual oil in the environment nine years after the Exxon-Valdez oil spill in Prince William Sound, Alaska.

Oil spills can occur in many parts of the short-tailed albatross' marine range. The Senkaku Islands (the island chain in which Minami-kojima occurs) is a candidate for future oil development (BBC 2003). This industrial development would introduce the risk of local marine pollution from 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 groups of individuals have occasionally been observed at sea (USFWS unpbl. data, Figure 6). An oil spill in an area where large numbers of short-tailed albatrosses are rafting could affect the population significantly. The birds' habit of feeding at the water's surface makes them vulnerable to oil contamination. Oiling decreases the feathers' insulating qualities and can lead to hypothermia and death (Golightly et al. 2002, Nariko 1999). Oiled breast feathers on incubating adults can also lead to embryo mortality. Studies have shown that less than a microliter of crude oil on a common eider egg will kill the incubating chick (Brunstrom et al. 1990). Hiroshi Hasegawa (pers. comm. 2002) has observed some birds on Torishima with oil spots on their plumage, but effects on short-tailed albatross reproduction have not been investigated.

Plastic

Consumption of plastics may also be a factor affecting the species' survival. Moore et al. (2001) found that in the North Pacific central gyre the mass of plastic was approximately six times that of plankton. Albatrosses often consume plastics at sea, presumably mistaking them for food items, or consuming plastic objects to which flying fish eggs have adhered. Plastics have been found in most, if not all, species of albatrosses. In necropsies conducted on 251 Laysan albatross chicks, Auman et al. (1997) found that more than 97% of the chicks contained plastic. The plastic items found within the chicks included resin fragments, beads, fishing line, buttons, checkers, disposable cigarette lighters, toys, PVC pipe, golf tees, dish-washing gloves, magic markers and cyalume light sticks. Beverage bottle caps were one of the most common plastic items seen in the Midway albatross colony in December of 2004 (G. Balogh, USFWS, pers. comm. 2004).

Short-tailed albatrosses on Torishima commonly regurgitate large amounts of plastic debris (H. Hasegawa pers. comm. 2002). Ingestion of sharp plastic pieces can result in internal injury or mortality to the birds. Large volumes of ingested plastic can result in a reduction of gut volume available for food and water absorption, leading to malnutrition 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) reported 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 as a whole). This study suggests that plastics ingestion reduces chick survival. Auman et al. (1997) also report that birds with heavy plastics loads have reduced resistance to the effects of lead poisoning and the avian pox virus.

Ingestion of plastic pellets may also be a direct source of toxic contaminants. For example, PCBs can reach "parts per million" concentrations on plastic resin pellets, and PCB tissue residues in some seabird species were positively correlated with mass of ingested plastic pellets (Tanabe et al. 2004). Hasegawa (pers. comm. 2002) has observed an increase in the occurrence of plastics in birds on Torishima over the last 10 years, but the effect on survival and population growth is not known.

In summary, available evidence indicates that a variety of contaminants may adversely affect short-tailed albatross population performance in the future. The paucity of information regarding contaminant exposure and effects demonstrates the need for research in this area.

Disease and Parasites

There are no known diseases affecting short-tailed albatrosses on Torishima or in the Senkakus 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 observes a wing-disabled bird every few years on Torishima, but the cause of the disability or injury is not known. An avian pox has been observed in Laysan albatross chicks on Midway Atoll, but it is unknown whether this pox infects short-tailed albatross or whether there is an effect on survivorship of any albatross species (USFWS 2000a). Avian flu and West Nile virus are other diseases to which short-tailed albatrosses could be vulnerable. As indicated above, body burdens of contaminants may increase susceptibility to disease.

Historically, several parasites were documented from short-tailed albatrosses on Torishima: a blood-sucking tick that attacks its host's feet, a feather louse, and a carnivorous beetle (Austin 1949). More recently, Ushijima et al. (2003) report collecting a tick, (*Carios capensis*) from black-footed albatrosses on Torishima. However, there is no evidence that these or other parasites have had population-level effects to short-tailed albatrosses (USFWS 2000a).

Predation

Sharks may take fledgling short-tailed albatrosses as they depart their natal colony (Harrison 1979). Shark predation is well-documented among other albatross species, but has not been documented for short-tailed albatross.

The crow (*Corvus* sp.) is the only historically known avian predator of short-tailed albatross chicks on Torishima. Hattori (in Austin 1949) reported that one-third of the short-tailed albatross chicks on Torishima were killed by crows, but crows are apparently not present on the island today (USFWS 2000a). There is a record from the 1960s of a short-tailed albatross chick being 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 short-tailed albatrosses (H. Hasegawa, pers. comm. 2002).

Invasive Species

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 feed on chicks and eggs of other seabird species (Atkinson 1985), and there have been numerous efforts of rat eradication to protect seabird colonies (Taylor et al.

2000, USFWS 2003). Cats (*Felis cattus*) were also historically present on Torishima, most likely from introductions during the feather-hunting period. They have caused damage to other seabirds on the island (Ono 1955), but there is no evidence of adverse effects to 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, and they are not currently present on the island (H. Hasegawa pers. comm. 2002).

In addition to non-native animals such as cats and rats, non-native plants can limit or destroy suitable nesting habitat on breeding islands. A list of plant species on Torishima was made in the 1950s (H. Hasegawa, pers. comm. 2002). Although at present there is no apparent invasive plant problem on Torishima, care should be taken to ensure that boots and gear of researchers are clean prior to visiting this island and Minami-kojima. Presence and control of invasive plants may be a concern on proposed reintroduction sites.

Air Strikes

Seabird collisions with airplanes have been documented by the Service on Midway Atoll National Wildlife Refuge since operation of the Henderson Airfield was transferred from the Department of Defense to the Department of the Interior in July 1997. Since acquiring the airfield, the Service has implemented several precautionary mechanisms to reduce and document seabird collisions (see Appendix 2). The Service has documented 135 seabird collisions with aircraft at Midway that resulted in bird mortality. An additional seven birds may have been struck by planes and killed. However, the Service was unable to ascertain the identity of these birds because they fell into the waters of the lagoon or into thick vegetation at the end of the runway. Monitoring data suggest that these unidentified birds are likely either Laysan or black-footed (not short-tailed) albatrosses.

Other Human Activities

A number of other human activities, both deliberate and unintentional, were considered by the START as having the potential to impact short-tailed albatross recovery. In the past, direct take through hunting and egging decimated the population. Such activities are unlikely to occur now, since the birds and their habitat are protected both legally and due to the remoteness of their nesting habitat. As new colonies become established, colony monitoring may be required if human disturbance becomes an issue.

Even if direct take is no longer a concern, unintentional take and human disturbance can potentially impact short-tailed albatrosses. Researchers monitoring the Tsubame-zaki colony, conducting telemetry and other studies, cause some level of disturbance, particularly on breeding albatrosses (H. Hasegawa, pers. comm. 2002), and they strive to minimize this disturbance. Field handling protocols that would standardize procedures for minimizing future take are being developed, in accordance with this recovery plan. In the future, any new colonies established should be managed to minimize the impacts of ecotourism, including contaminants from cruise ships, and direct disturbance. Potential new colony sites should be carefully evaluated to minimize the possibility of future impacts from nearby military activities or other sources. Human disturbance is not considered to be a significant threat to short-tailed albatrosses at present.

Stochastic and Genetic Factors

As discussed by Gilpen (1987), small populations will have difficulty surviving the combined effects of demographic and environmental stochasticity (i.e., uncertainty). Demographic stochasticity refers to random events that affect the survival and reproduction of individuals (Goodman 1987). Environmental stochasticity is due to random, or at least unpredictable, changes in factors such as weather, catastrophic events, food supply, and populations of predators (Shaffer 1987). The estimated 2004–05 world population of short-tailed albatrosses is under 2000 birds (see Current Population Status section above). This small population size puts them at risk to the deleterious effects of demographic and environmental stochasticity. Increasing the loss of adult birds due to the additive mortality associated with human-related threats considered above, in combination with natural mortality and a major catastrophic event, could potentially destabilize population size, birth rate, and slow or preclude the recovery of this species.

All known and potential threats discussed above are summarized in Table 3, along with the appropriate listing factor category. This table results from a thorough review of threats conducted at the first Short-tailed Albatross Recovery Team meeting.

Table 3. Known and Potential Threats to Short-tailed Albatross

Threat Category	Threat	Known (K) or Potential (P) Threat	Listing Factor*
Catastrophic events at breeding colonies	Volcanism (lava, gas, pyroclastic flows, habitat destruction)	K	A
	Earthquakes/ landslides	P	A
	Typhoons (and associated erosion, wind, wave action, and flooding)	K	A
	Lightning	P	E
Global changes	Climate change (effect on breeding colony climate or food supply)	P	E
	Oceanic regime shift and effect on food supply	P	E
Demersal longline fisheries	Alaska	K	E
	Russia	K	D/E
	British Columbia	P	D/E
	High seas and other countries	P	D/E
Pelagic longline fisheries	U.S.	P	D/E
	Japan	P	D/E
	Russia	P	D/E
	High seas and other countries	P	D/E
Gillnet fisheries	Japan	P	D/E
	High seas	P	D/E
Jig/troll fisheries	Japan	K	D/E
	U.S.	P	D/E
	High seas	P	D/E
Trawl fisheries	U.S.	P	D/E
	Japan	P	D/E
	Russia	P	D/E
	High seas and other countries	P	D/E
Derelict gear	hooks in offal	P	D/E
	Lost gillnets, longlines, trawl nets, seines, pots	P	D/E
Offal Discharge, Resource Depletion	Increases risk of bycatch	P	D/E
	Supplemental feeding leads to dependence	P	D/E
	Concentrates contaminants	P	D/E
	Direct take of squid or other foods by humans	P	D/E
	Competition with other species in food chain	P	D/E
Contaminants - oil	Oil Spills	P	D/E
	Chronic oiling	P	D/E
	Future Oil Development near colonies	K	D/E

Table 3. Continued.

Threat Category	Threat	Known (K) or Potential (P) Threat	Listing Factor*
Contaminants - plastics	Physical impacts of plastic ingestion	K	D/E
	Plastic ingestion as vector for other contaminants	P	D/E
Contaminants - metals	Mercury	P	D/E
	Lead	P	D/E
	Cadmium	P	D/E
Air strikes	e.g., at Midway Island	P	D/E
Disease/parasitism	West Nile Virus, avian pox, avian influenza, Ticks	P	C
Predation & other Natural factors	Sea eagles	P	C
	Sharks	P	C
	Crows	P	C
	Phytoplankton blooms (red tides)	P	E
Invasive species	Competition for nest sites with black-footed albatross	P	E
	Chick harassment by black-footed albatrosses	P	E
	Rats	K	C
	Snakes	P	C
	Goats	P	A
	Cats	K	C
Other human activities	Invasive Plants	K	A
	Eco-vandalism and Illegal take	P	B
	Ecotourism (Bonin Islands)	P	E
	Contaminants from cruise ships	P	E
	Researcher disturbance	K	E
	Catching birds, egging	P	B
	Political turmoil	P	E
	Military exercises	P	E
Genetic/Stochastic	Genetic bottleneck, inbreeding depression, genetic drift, due to suppressed numbers	P	E

* Listing Factors (as enumerated in Section 4(a)(1) of the Endangered Species Act:
A – Destruction or curtailment of habitat or range
B – Overutilization for commerce, recreation, education, or scientific purposes
C – Disease or predation
D – Inadequacy of existing laws
E – Other natural or human-related factors

CURRENT RESEARCH AND RECOVERY ACTIONS

Population Monitoring

The Tsubame-zaki breeding colony on Torishima has been monitored annually since the mid-1950s (see Figure 5), and all chicks have been banded since 1977. A subsample of chicks has been color-banded since 1979 (Appendix 3). The Senkaku population has been monitored less regularly; access to that colony is difficult both logistically and politically. The START ranks as a high priority both continued monitoring of the Tsubame-zaki breeding colony and regular monitoring of the Senkaku population.

Breeding Enhancement

Two primary activities have been undertaken to enhance breeding success on Torishima. First, breeding site enhancements at the Tsubame-zaki colony have improved nesting success. In 1981, a habitat improvement project was initiated, with the support of the Environment Agency of Japan. Grass was transplanted to nesting areas, and loose volcanic soils were stabilized. Also, volcanic ash, which accumulates in breeding habitat, is removed annually (H. Hasegawa, pers. comm. 2004). Breeding success at this colony has improved following the habitat enhancement efforts (Hasegawa 1991). Second, in 1991, the Yamashina Institute of Ornithology initiated efforts to attract breeding birds to an alternate, relatively level, well-vegetated site on the northwest side of Torishima, which is less likely than the main colony to be affected by lava flows, mud slides or erosion. Realistic albatross decoys and continuous recordings of short-tailed albatross vocalizations are used to lure the birds to the alternate site, named Hatsune-zaki (K. Ozaki, Yamashina Institute, pers. comm. 2002, Figure 7). In 1997, a satellite video system was installed at Hatsune-zaki, which transmits live to Tokyo. This system allows remote observation of many previously unobserved aspects of parental behavior and chick development without disturbing the birds.

As stated above, one pair has nested at the new colony site for several years, producing seven chicks between 1996 and 2004 (see Figure 8 and Table 4). In the 2004–05 nesting season, three additional pairs nested. All four pairs successfully fledged a chick at this colony site in 2005. In addition, the number of short-tailed albatross visits and overnight stays at Hatsune-zaki increases each year. Yamashina researchers reported an average of about 14 short-tailed albatrosses landing at the artificial colony site at sunset each evening during the 2003–04 nesting season (K.Ozaki pers. comm. 2005).

Figure 7. Japanese researchers setting decoys at Hatsune-zaki. *Photo: Yamashina Institute for Ornithology*

Table 4. Short-tailed albatross breeding activity at Hatsune-zaki Colony, Torishima

Breeding Season	Breeding Success
1995–96	one egg hatched, chick fledged
1996–97	two eggs, both failed to hatch
1997–98	one egg hatched, chick fledged
1998–99	one egg hatched, chick fledged
1999–00	one egg hatched, chick fledged
2000–01	one egg hatched, chick fledged
2001–02	one egg not hatched
2002–03	one egg hatched, chick fledged
2003–04	one egg hatched, chick fledged
2004–05	all four chicks fledged

Figure 8. Chick and young parent at Hatsune-zaki, the artificial colony created on Torishima. *Photo: Yamashina Institute for Ornithology*

Telemetry

Japanese researchers, supported by the Environment Agency of Japan, began using satellite telemetry tags ("platform-transmitting terminals," or PTTs) to track movements of subadult short-tailed albatrosses in 1996 (Figure 9, Table 5). The objectives were to determine the birds' migration routes and main foraging areas. The number of radios deployed, attachment methods and tracking periods are shown below. U.S. researchers began participating in these efforts in 2001, and captured four short-tailed albatross in Alaskan waters during the post-breeding season in 2003.

Table 5. Attachment method and transmission duration for satellite transmitters attached to short-tailed albatrosses on Torishima Island, Japan.

Year	No. PTTs	Attachment method	Capture Month	Tracking duration (days)
1996	3	Glue	May	3–50
1997	3	Glue	May	13–37
1998	1	Glue	May	84
2001	3	Harness	May	18–120
2002	9	Glue/Tape	May	2–132
2003	7	Glue/Tape	May	51–113
2003 (at sea)	4	Glue/Tape	August	15–111

Of the short-tailed albatrosses tracked in 2002, four that were followed for 3–4 months exhibited two distinct post-breeding dispersal strategies. Two moved steadily north along the continental shelf, both reaching the western Aleutian Islands within 5 weeks. The other two albatrosses traveled north and south along the coasts of Honshu and Hokkaido, Japan, and up to the southern Kuril Islands, Russia, for nearly 3 months. In early September they too began to move north and east toward the Aleutian Islands, spending considerable time in the Kuril Islands and southern Kamchatka Peninsula along the way. More details about these birds' movements, including maps, are presented in Appendix 4.

During August, 2003, in an effort to define further where the short-tailed albatrosses are foraging after the breeding season, short-tailed albatrosses were captured at sea and tagged with PTTs. Preliminary results of this effort have given us an indication of where these birds captured in Alaskan waters range and forage, as compared with birds tagged earlier in the season on Torishima (Figure 10). Such information will allow us to determine whether other fisheries, in addition to Alaska's longline fishery, may potentially be affecting short-tailed albatrosses. For example, a juvenile short-tailed albatross was the first and only study bird to travel along the west coast of North America where seabird deterrents are not used in commercial fisheries (Balogh and Suryan 2005).

Figure 9. Deployment of satellite tag on adult short-tailed albatross, Torishima, Japan.

Protected Status of Breeding Birds and Habitat

The Japanese Government designated the short-tailed albatross as a Natural Monument in 1958, as a Special Natural Monument in 1962 (Hasegawa and DeGange 1982) and as a Special Bird for Protection in 1972 (King 1981). Torishima was declared a Natural Monument in 1965 (King 1981). These designations have resulted in tight restrictions on human activities and have prevented disturbance on Torishima (H. Hasegawa pers. comm. 1997). In 1993, the species was classified as a Domestic Endangered Species under the Species Conservation Act in Japan, which makes National Government funds available for conservation programs. The Japanese "Short-tailed Albatross Conservation and Breeding Project Program" outlines general goals for continuing management and monitoring of the species, and future conservation needs (Environment Agency Japan 1993, See also Appendix 5). The principal management practices used on Torishima are legal protection, habitat enhancement, and population monitoring.

Fisheries-Related Research and Management

Studies conducted by the Washington Sea Grant Program (WSGP) in 1999 and 2000 indicated that paired streamer lines, towed behind longline fishing vessels as they are setting lines, are very effective at reducing seabird attacks on bait, thus reducing potential bird hookings and drownings (Melvin et al. 2001). These results are reflected in the National Marine Fisheries Service's revised

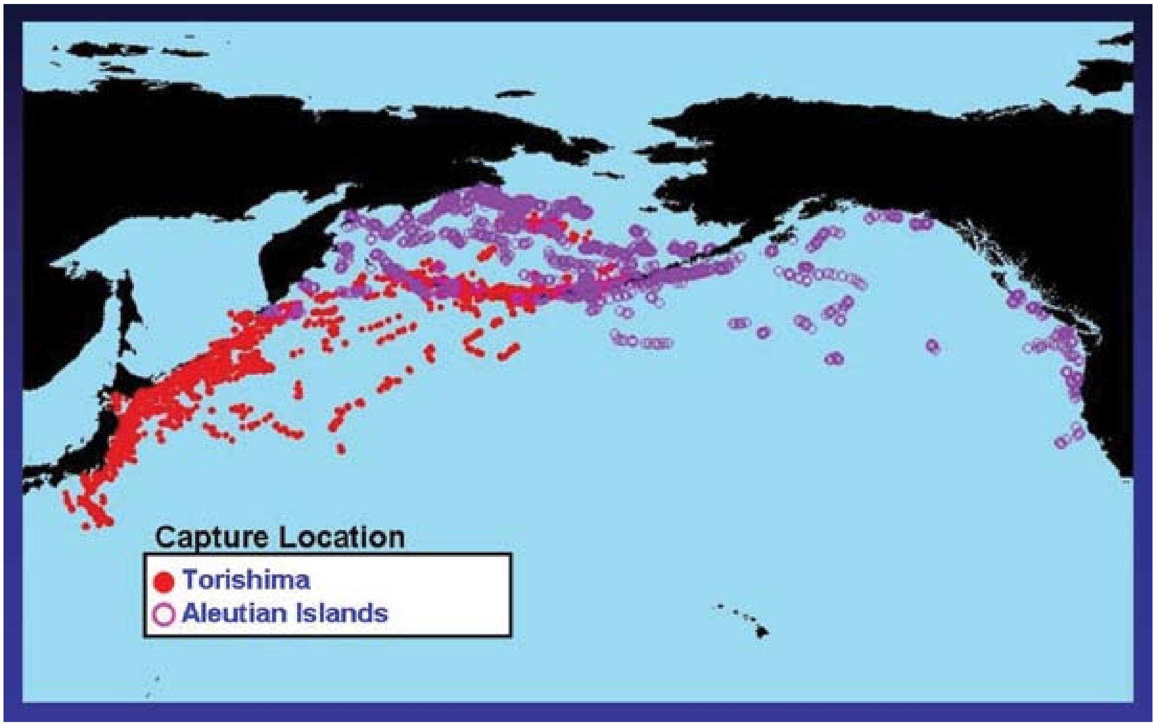

Figure 10. Comparison of locations from short-tailed albatrosses captured at Torishima vs. the Aleutian Islands. *(Balogh and Suryan 2005)*

regulations, effective February 2004, which require longline fishing vessels of various length classes to deploy streamer lines when fishing (NMFS 2004b, Appendix 6). These regulations are the best match between the reality of fleet demographics and the findings of Melvin et al. 2001 (E. Melvin, WSGP, pers. comm. 2003).

In addition to their streamer line work, WSGP is also studying whether integrated-weight groundlines, with their faster sink rates, are effective in reducing seabird bycatch. Preliminary results suggest that 50-g-per-meter line is the optimal weighting, in terms of performance in auto-bait longline systems, sink rate, and ease of handling. Work planned in 2004 and 2005 will compare the catch rates of all species, the abundance and behavior of seabirds, and the sink rate of groundlines under different combinations of integrated weight and unweighted groundlines and streamer lines.

WSGP is also in the initial stages of testing the effectiveness and need for seabird deterrents in the Alaska pelagic and demersal trawl fisheries. Preliminary pilot study results indicate that streamer lines, a warp boom, snatch block, and fish oil all have potential as seabird deterrents for the trawl fishery (Melvin 2004). In another trawl-seabird deterrent study, Sullivan et al. (2004) reported that streamer lines and a device called a "warp scarer" significantly reduced seabird contact rates with trawl cables, as compared with controls. This research, conducted in the Falkland Islands by the Seabirds at Sea Team and the Falklands Fisheries Department, has resulted in the mandatory use of tori lines as a licensing requirement for finfish vessels for the Falklands' second season of 2004 (Sullivan and Reid 2004).

WSGP is also analyzing the spatio-temporal distribution of short-tailed albatross and other seabirds, based on survey data from Alaska Department of Fish and Game, the International Pacific Halibut Commission (IPHC), and the NMFS. This analysis may help to determine the relative distribution of seabirds on the longline fishing grounds and to identify areas where seabird mitigation may not be necessary.

A number of measures are already in place for Hawaii-based pelagic longline fisheries when fishing north of 230 N latitude, including use of a line-setting machine; minimum 45-gram weights on branch lines; thawed and blue-dyed bait; and strategic offal discharge. With the reopening of a limited swordfish fishery in Hawaii, NMFS and the Western Pacific Fishery Management Council will be reviewing and revising these seabird avoidance measures (H. Freifeld, USFWS, pers. comm. 2004).

At its 23rd Session in 1999 the Committee on Fisheries of the Food and Agriculture Organization of the United Nations (FAO) adopted its International Plan of Action-Seabirds, a voluntary instrument, which encourages member nations to assess the levels of seabird mortality in their longline fisheries, and if found warranted to produce their own National Plans of Action to reduce this mortality. FAO member nations agreed to develop national plans to address fleet capacity and to control the size of distant-water fishing fleets, preferably by 2003 and no later than 2005.

Japan completed their National Plan of Action (NPOA) in February 2001 (Appendix 7). The Plan includes specific area restrictions within 20 nautical miles of Torishima from October to May, the main part of the short-tailed albatross breeding season. The U.S. NPOA, also completed in 2001, can be accessed at: http://www.fakr.noaa.gov/protectedresources/seabirds/npoa/npoa.pdf.

Many of the regulatory, research, and outreach measures in Japan's NPOA are similar to measures in the U.S. NPOA. Kiyota and Minami (2005) indicate that Japanese research on seabird bycatch mitigation has yielded similar results to such research in the U.S. It is desirable that the U.S. and Japan coordinate closely on further testing of methods such as the tori pole (streamer lines), weighted lines, thawed and blue-dyed bait, underwater and night setting, and controlling offal discharge.

As part of their Bering Sea Program, the World Wildlife Fund (WWF) has initiated research and outreach to the Russian longline fishing fleets regarding methods for seabird bycatch reduction. Because the Russian fleets have no mandatory observer program, estimates of seabird bycatch by Russian commercial longline vessels are unavailable. However, the pilot observer program facilitated by WWF has provided some insight into this question, as indicated by the following quote, excerpted from a report (April, 2004) to WWF by Yuri Artyukhine, a Far East bird specialist working on the WWF Bering Sea Project:

Paired streamer lines are towed behind a longline fishing vessel to reduce seabird attacks on bait.

> *During the fishing activity in the Commander Islands zone, in December of 2003 a short-tailed albatross (young individual) was observed, which for the course of several hours remained near the vessel during the setting and pulling up of the lines. This bird actively attacked the bait on hooks during the setting, putting its life in danger. This observation along with the documented mortality of a short-tailed albatross near Navarin Cape in August of 2003 again demonstrated that the longline fishery in the Russian waters of the Far East presents a realistic threat to this rare species.*

Since there are no mandatory gear restrictions on the Russian fishing fleet, WWF, with Service support, is approaching the solution by demonstrating to the fishermen how much money they can save by reducing bait loss when using streamer lines and other bird deterrent devices. Through the WWF program, an American fisherman and a researcher familiar with the use of state-of-the-art bird deterrent devices in the U.S. visited Russian fishermen in spring, 2004, to share and exchange ideas.

In 2003, a snapper fisherman from New Zealand, and a tuna fisherman from Australia shared a prize in an SEO/Birdlife International competition held to find ways to stop seabirds being killed during longline fishing operations. They independently submitted the same idea of dripping fish liver oil onto the water behind vessels as they set bait. Subsequent tests by other researchers have shown significant reductions in the number of seabirds both following vessels and diving for bait when fish oil is dripped onto the water (W. Norden and J. Pierre pers. comm. 2005, E. Melvin pers comm. 2005). However, further tests need to be conducted to determine the birds' response under different conditions and whether the oil itself could result in feather fouling.

Outreach

The Service has established a program for providing streamer lines free of charge to the Alaska longline fleet and free demonstration tori lines to foreign Pacific longline fisheries upon request. Information on how to obtain these is available on the NMFS Alaska web site, at: http://www.fakr.noaa.gov/protectedresources/seabirds/streamers.htm. The WSGP has produced an information pamphlet that provides further details, including a schematic of the streamer lines and their proper deployment (Figure 11). A cooperative program to develop and distribute lighter weight tori lines designed specifically for smaller vessels is presently being conducted by the WSGP, Alaska Sea Grant, the Service, and Pacific States Marine Fisheries Commission.

An educational video for fishermen in Alaska, entitled "Off the Hook," is also available. The video

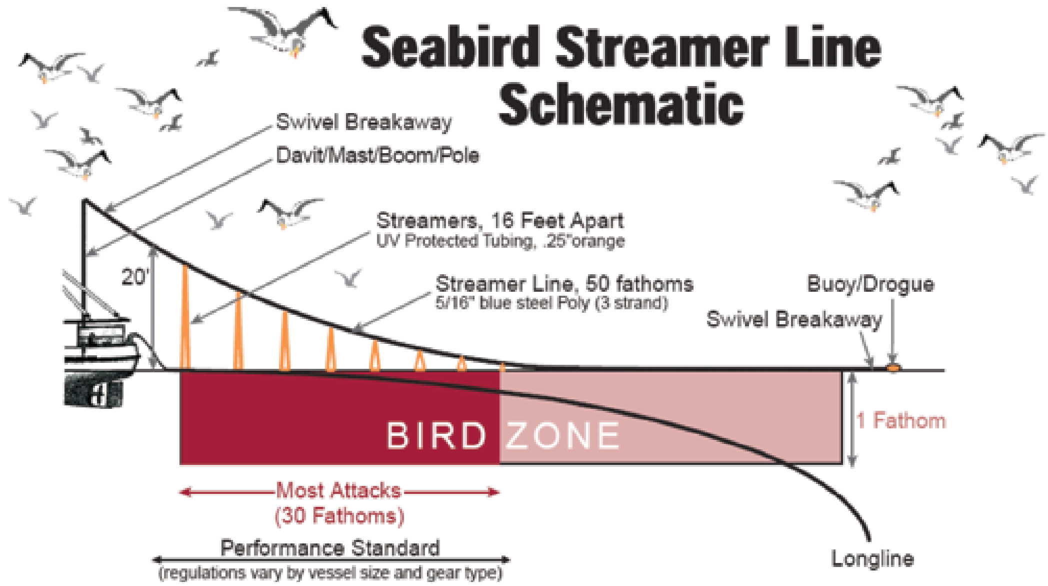

Figure 11. Schematic of streamer lines used in Alaska longline fishery. Streamer lines of this design are available at no cost to members of the Alaska longline fleet. For more information, visit the Washington Sea Grant web site: http://www.wsg.washington.edu/pubs/acquisitions.html

was produced jointly by the Washington Sea Grant Program and the University of Alaska, Fairbanks, Marine Advisory Program, with funding from the U.S. Fish and Wildlife Service. It has been duplicated and distributed, with funding from the Alaska Department of Fish and Game, to all Alaska Federal Fisheries (hook-and-line endorsement or IFQ) Permit holders affected by the new seabird bycatch avoidance regulations. Video clips may also be downloaded from the WSGP web site: http://www.wsg.washington.edu/outreach/mas/fisheries/seabirdvideo.html. Spanish and Russian language versions of this video are also available.

A recent publication (Gilman 2004) lists available educational materials addressing seabird bycatch in pelagic and demersal longline fisheries worldwide. A recent report by BirdLife International (Small 2005) evaluates the performance in seabird incidental catch reduction of the 14 Regional Fisheries Management Organizations (RFMOs) whose areas overlap with albatross distribution. RFMOs are of central importance to sustainable, ecosystem-based management of the world's oceans.

The Agreement on the Conservation of Albatrosses and Petrels (ACAP) was established "to achieve and maintain a favorable conservation status for albatrosses and petrels." This Agreement, which became effective on 1 February 2004, focuses on Southern Hemisphere species but provides outreach about albatrosses in general and may spawn research, for example, in reduction of seabird bycatch in fisheries that is relevant to our northern hemisphere species.

RECOVERY STRATEGY

As indicated in the Final Rule listing the short-tailed albatross as an endangered species (USFWS 2000a), the primary threat leading to the species' decline was over-harvest. Small population size, limited number of breeding sites, and potential volcanic eruptions were seen as the current major threats to the species, and threats to the species' recovery from marine pollution and interactions with commercial fishing operations were also noted.

Unlike most endangered species, the primary factor originally leading to the short-tailed albatross' endangerment (i.e., hunting on a massive scale) no longer occurs. Furthermore, observed rates of reproduction indicate that the species is not currently experiencing density-dependent or notable human-related limitations to population growth. High rates of reproduction can be expected from a once-numerous species that is now well below its carrying capacity (less than .03 percent of estimated historical population) (Wilson 1971). In theory, this species would seem to have a higher chance of achieving recovery than many other endangered species, which are victims of habitat destruction and fragmentation.

Of the five factors addressed in the final rule listing the short-tailed albatross, the factor of overriding importance, which influences the other factors as well, is the Factor A, the present or threatened destruction, modification, or curtailment of its habitat or range. Although Torishima, where the majority of these birds breed, is protected as a Natural Monument by the Japanese Government, and efforts are continuing to minimize the effects of erosion, no one can protect the Tsubame-zaki breeding colony from the threat of a volcanic eruption that could devastate the population.

Managing for Volcanic Events, the Major Threat

At this time, the START believes that the potential for future volcanic events on Torishima is the most serious threat to the species. Currently, 80–85% of the world population breeds on a highly erodible slope on the outwash plain from the caldera of an active volcano. Monsoons send torrents of ash-laden water down this slope across the colony site. A volcanic eruption could also send lava, ash or poisonous gasses through the colony site. Establishing viable breeding colonies in other safer locations is paramount to ensuring the survival and recovery of the short-tailed albatross.

Consequently, the START has unanimously agreed that establishment of additional colonies on safe (i.e., not subject to volcanic activity and protected) sites will be a recovery prerequisite. This goal may be attained by several means, including:

1. conducting searches for additional colonies and protecting any that may be found;
2. setting up artificial colonies with decoys and sound systems in likely locations, to attract breeding birds; and
3. translocating a small number of albatrosses (most likely post-guard chicks) from Tsubame-zaki (the main colony on Torishima) to prepared site(s).

Torishima eruption, August 2002.

Finding Additional Colonies

We do not expect that searches will yield notable new short-tailed albatross breeding colonies, as many areas have already been checked (H. Hasegawa pers. comm. 2002), and all birds that have been handled at sea bear the tags of Torishima banding operations. However, we will remain alert for indications that unknown colonies exist. Future marine-based satellite telemetry may aid in the discovery of any such sites.

Creating Artificial Colonies

The two methods considered for creating new colonies are passive attraction and chick translocation. These methods are not mutually exclusive, since the equipment used for passive attraction (i.e., decoys and sound system) would also be used at a chick translocation colony site.

Passive attraction of birds to an artificial colony site has already been initiated on Torishima. From the 1996 through 2003–04, a single pair bred at the new site, successfully rearing seven chicks (Figure 8). At the beginning of the 2004–05 breeding season, three additional pairs were observed nesting at the Hatsune-zaki site. All four chicks fledged successfully (K. Ozaki and T. Deguchi, Yamashina Institute for Ornithology, pers. comm. 2005). The number of other potential breeders showing interest in the site is also increasing. Observers reported a fourfold increase in overnight visits in 2004 compared to 2003 (K. Ozaki pers. comm. 2004). The START has considered that artificial colonies may be even more effective at attracting breeding birds if the colony is located further away from the "super-attractant" of the natural colony on Torishima.

Immediate success of chick translocation will be difficult to assess, since short-tailed albatrosses do not return to breed until age 5 or 6. Furthermore, Gummer (2003), in reviewing chick translocation, cites experiments conducted by Fisher (1971) in which Laysan albatross chicks older than about one month of age tended to return to their natal site, rather than to their release site. This suggests that translocation is likely to be more successful with younger chicks, which will require some amount of hand-rearing. Additionally, there are concerns that any chicks removed from the Tsubame-zaki colony for translocation purposes will slow the recovery of that established population. However, this becomes less of a concern as the Tsubame-zaki population continues to increase and may at some point even show signs of suitable nest site limitations (H. Haswgawa pers. comm. 2004).

The START has stressed the importance of testing all phases of translocation work on a surrogate species prior to attempting to translocate short-tailed albatross chicks. The surrogate species for this work will most likely be post-guard black-footed albatross chicks from Torishima Island.

Additional Recovery Tasks

The remaining high-priority recovery tasks address threats that fall under Factor E, Other Factors mentioned in the final rule. These focus primarily on contaminants and fisheries interactions and will be addressed through education, outreach, and research. Most of these additional tasks address the threats listed in Table 3. Some of these tasks fill in knowledge gaps that currently hinder us from effective management (e.g., genetics studies will help us determine how many unique genetic stocks comprise this species). Not all listed threats have a corresponding recovery task. In these cases, the START decided that the threat was not sufficiently urgent to warrant addressing, at least until more pressing threats have been adequately addressed. Additional recovery tasks may become appropriate, as new information is obtained. Recovery tasks fall under several categories: species management, habitat management, education and outreach, and research. The prioritization of recovery tasks generally follows the perceived level of threat to the species if that task is not accomplished.

The recovery program for the short-tailed albatross differs from that of most of the Service's listed species in that many major recovery actions for the short-tailed albatross will likely be conducted outside the United States. Recovery implementation for this species will involve coordination with foreign governments and institutions and will require much at-sea work. Achieving recovery objectives for this species will thus require extensive funding and a truly long-term commitment from all partners.

Nesting short-tailed albatross with parent that has not yet attained full adult plumage. Birds are breeding at a younger age due to the small population size and a lack of intraspecific competition.

Recovery

GOAL

The goal of this recovery plan is to bring about the recovery of the short-tailed albatross, such that protection of the Endangered Species Act is no longer required.

OBJECTIVE

The major objective of this recovery plan is to outline a strategy and describe actions that will result in increasing numbers of the short-tailed albatross and established breeding populations in "safe" locations (i.e., sites with no potential for volcanic eruption and minimal chance of massive erosion).

CRITERIA

Reclassification of the short-tailed albatross may be considered when the following conditions are met:

Endangered to Threatened

The short-tailed albatross may be reclassified from endangered to threatened under the following conditions:

1. The total breeding population of short-tailed albatrosses reaches a minimum of 750 pairs; and
2. The 3-year running average growth rate of the population as a whole is ≥ 6% for ≥ 7 years; and
3. At least three successful breeding colonies (≥ 5 breeding pairs each) exist, at least two of which occupy non-volcanic (or extinct volcanic) islands.

Delisted

The short-tailed albatross may be delisted under the following conditions:

1. The total breeding population of short-tailed albatrosses reaches a minimum of 1000 pairs; and
2. The 3-year running average growth rate of the population as a whole is ≥ 6% for ≥ 7 years; and
3. A Total of at least 250 breeding pairs exist on at least 2 non-volcanic islands; and
4. A minimum of 10 percent of these (i.e., ≥ 25 pairs) occur on a site or sites other than the Senkaku Islands.

Threatened to Endangered

The short-tailed albatross may be reclassified from Threatened to Endangered under the following conditions:

1. Fewer than 750 breeding pairs exist, and the population has had a negative growth rate for at least 3 years; OR
2. Breeding colonies occur on fewer than three island groups.

Mated pair of short-tailed albatross. Pairs mate for life.

SHORT-TAILED ALBATROSS RECOVERY PLAN NARRATIVE OUTLINE

At the May, 2004, START meeting, the Team developed and ranked 51 potential recovery tasks. The tasks are shown in ranked order in Appendix 8. The narrative outline that follows refers to tasks by task number. These narratives are not in order of priority. We have parenthetically noted the highest ranked tasks.

1.0. Support ongoing population monitoring and habitat management on Torishima

Hiroshi Hasegawa from Toho University has been monitoring the Tsubame-zaki breeding colony since the early 1980s. Researchers from the Yamashina Institute have also conducted studies and management activities critical to the recovery of these birds and our understanding of them. It is essential to ensure that this ongoing work continues. The Japanese government and industries have been funding this work, but a predictable source of funding is required for the future. The mechanism of Cooperative Agreements and Grant Agreements with the academic and non-profit institutions involved in short-tailed albatross research, monitoring and management is seen as the most expedient way for the U.S. to support this work in Japan, and allows for the most flexibility for Japanese resource managers to implement recovery.

1.1. Continue annual monitoring of Tsubame-zaki and Hatsune-zaki on Torishima *(Ranked in the top 5 of 51 recovery tasks)*

This work has been ongoing at Torishima Island since the early 1980s and is essential for our understanding of population status and trends. Monitoring of the Minami-kojima population in the Senkaku Islands has been less consistent, but is considered a high priority (see Task 2.0). Support of annual population monitoring should be provided, to ensure a database that allows for analysis of population abundance and trends. If possible, a feather should be collected from each banded fledgling to determine gender.

1.2. Prepare protocols for population monitoring data collection

Protocols for data collection (survival, age at first breeding, proportion of breeding aged adults that attempt to breed, baseline population information, behavior) should be developed in order to ensure consistency of data collection into the future.

1.3. Erosion control

The portion of Torishima Island where the majority of birds nest is unstable. Efforts to stabilize this colony site have been undertaken in the past. Revegetation has been partially successful. Gabions reduce influx of ash only temporarily. Erosion control measures need to continue to promote stability of nest sites.

1.3.1. Torishima erosion control; dig new drainage swale around Tsubame-zaki colony

Runoff water and eroding ash from a portion of the volcano's caldera flows through the colony site during and after storms. Reconfiguring the drainage channel to flow around the colony site should alleviate the threat of egg destruction and chick mortality.

1.3.2. Torishima erosion control; maintain existing gabions above Tsubame-zaki colony

As of 2004, the existing gabions are full to capacity or are corroding away. These need to be enlarged, repaired, or replaced.

1.4. Conduct decoy and sound system maintenance at artificial colonies *(Ranked in the top 5 of 51 recovery tasks)*

Since 1991, Japanese researchers have been taking measures to lure adult birds and new breeders to a more stable (less steep, more vegetated) site on Torishima Island, through use of realistic decoys and continuous playback of breeding colony sounds during the breeding season. This site, Hatsune-zaki, is used by many black-footed albatrosses, and has had one nesting pair of short-tailed albatrosses for the past 8 years (as of 2003–04), successfully fledging 6 chicks. In 2004–05, this pair and 3 additional pairs nested at this site successfully fledging four chicks (K. Ozaki and T. Deguchi pers. comm. 2005). The decoys need to be cleaned and painted, and the sound system maintained regularly.

1.5. Develop and employ appropriate leg bands

1.5.1. Develop and deploy abrasion-resistant leg band (titanium or Darvic™)

On long-lived birds such as short-tailed albatross, loss of standard stainless steel or monel leg bands can occur, resulting in loss of valuable long-term survival data. A more wear-resistant band made of titanium or Darvic™ should be researched, tested, and used, as appropriate.

1.5.2. Develop and deploy color (or readable stainless) bands for Tsubame-zaki colony (Ranked in the top 10 of 51 recovery tasks)

Application of year-specific color bands, or field-readable stainless steel or Darvic bands, would be useful for identifying year class, age at first reproduction and other valuable demographic information from a distance.

1.5.3. Continue assistance with color banding operations on Torishima

Until recently, Dr. Hasegawa had discontinued color banding of chicks because they became too numerous for him to accomplish the job without spending too long, thus unduly disturbing birds on the colony. An assistant, as provided in 2004-2005, allowed him to reinstate his color banding effort. This assistance should continue in future years, to promote efficiency of survey and banding efforts, as this colony continues to increase.

2.0. Monitor Senkaku population (*Ranked in the top 5 of 51 recovery tasks)*

Regular, annual monitoring of the Senkaku population has not been feasible. The START indicates that demographic data from this colony should be collected on a continuing basis. Ideally, scientists would make two trips per breeding season to Minami-kojima in the Senkakus to record the number of eggs laid, and the number of chicks fledged. Due to the difficulties associated with Senkaku Islands access, these trips may need to be organized by an international ornithological group, such as Birdlife International. We anticipate that the first such survey will require considerably more effort than subsequent surveys. At present, we anticipate conducting these surveys every third year, assuming counts remain as expected. Mathematical modeling has indicated that this population may eventually outnumber the Tsubame-zaki population (P. Sievert pers. comm. 2004; Appendix 1).

3.0. Conduct telemetry studies

Telemetry studies, primarily using satellite, or "platform-transmitting terminal" (PTT) telemetry, are needed to understand the movements of these far-ranging birds and to identify important foraging areas or areas where birds may congregate. Telemetry work should be planned with clear goal statements, so that we understand how each study fits in to the overall scheme of information we seek, and so that we recognize when our goals have been met.

3.1. On Torishima

In order to protect short-tailed albatross, it is essential to learn where they forage during both breeding and non-breeding seasons. To this end, satellite telemetry has been conducted on a few subadult and post-breeding albatrosses captured at the Torishima colony site since 1996. This work should be continued and extended to adult birds in future years. Support for future telemetry work would include costs of equipment, travel, and analysis.

3.1.1. Conduct Torishima telemetry work; breeders during breeding season *(Ranked in the top 5 of 51 recovery tasks)*

Data obtained since the late 1990s on post-breeding season distribution of breeders and non-breeders have shown that the birds have different rates of dispersion from the colony and take different routes from Japan to Alaska and Russia. Further telemetry collected on breeders during the breeding season will reveal these birds' flight patterns and important foraging areas used during this critical life stage.

3.1.2. Conduct Torishima telemetry work; fledglings, sub-adults, post-breeders

This task continues work ongoing since 1996. Analysis of data from 23 tagged sub-adult and post-breeding birds is ongoing (R. Suryan, pers. comm. 2005). Obtaining additional telemetry data for sub-adult and post-breeding birds was identified as a lower rank (18th) than obtaining data from breeding birds (ranked 5th). The priority of obtaining telemetry data from fledglings was not explicitly stated, but is considered to be of lower importance than obtaining data from breeding birds during breeding season.

3.2. Conduct at-sea capture and telemetry to determine marine distribution during non-breeding season

Satellite telemetry of short-tailed albatrosses captured at sea (i.e., away from the main colony site) can yield information not only about the birds' use of marine habitat, but can also indicate whether they visit other islands, thus providing insight into potential translocation colony sites. Initial indications are that this is an expensive and inefficient way to obtain satellite telemetry data, but until transmitters can be safely affixed to birds so that they yield data for more than a few months at a time, at-sea capture may be necessary to obtain movement data for these birds during certain times of year (i.e., October to May).

3.3. Evaluate methodologies

Research needs to be conducted to test the performance and safety of various field methodologies (e.g., dipnet versus drive net or harness versus tape attachment of transmitters). Performance and practicality of certain field equipment (e.g., archival tags versus. standard PTTs versus. solar-powered PTTs) also needs to be tested.

3.3.1. Conduct PTT attachment evaluation

Harness attachment of PTTs potentially allows greater attachment time, thus more continuous (up to year-round) positional data streams from birds. However, the effects of harness attachment on the birds' behavior and survival have been questioned (Phillips et al. 2002; Freeman et al. 1997; Petrie and Rogers 1997). Preliminary tests have been conducted with attaching PTTs on time-release harnesses to a surrogate species, the black-footed albatross (K. Ozaki, pers. comm. 2004). The second generation of this time-release mechanism succeeded in three of eight instances; longer-term effects of harnesses to the birds (especially unreleased harnesses that remain in place) are not yet known. Solar-powered PTTs attached to harnesses could even result in multi-year data streams from an individual, if harness effects proved to be discountable.

3.3.2. Evaluate / deploy archival tags

Archival tags provide a means for acquiring data on an animal's movements, diving depth, body temperature, and ambient temperature. They are generally smaller and less costly than PTT (satellite telemetry) tags and can provide more than just location information. However, current technology requires that these birds be recaptured to retrieve these data. Research underway may result in the development of a radio link by which archival data could be downloaded without retrieving the tag (Laboratory for Applied Biotelemetry & Biotechnology, Texas A&M University). Development of this methodology should be monitored and archival tags deployed on short-tailed albatrosses as appropriate.

3.4. Develop clear goal statement of telemetry work

In order to make certain that we are allocating our scarce recovery resources effectively, the START should develop a clear goal statement for all phases of telemetry work so that we know when our goals have been reached and intense efforts to obtain additional telemetry data can or should cease.

3.5. Determine at-sea distribution; get assistance from an NGO to organize international data collection from ships of opportunity

The U.S keeps a dataset of at-sea observations made opportunistically by people at sea, mostly from people aboard fishing and research vessels. The START indicated a desire to try obtaining like data from other countries, and preliminarily determined that an international non-profit organization may be the best entity to undertake this task.

4.0. Establish One or More Nesting Colonies on Non-Volcanic Islands

Although complex and costly, this is the keystone outcome that must be achieved to effect recovery of the short-tailed albatross. The one main colony site (where over 80 percent of the world population breeds) is vulnerable to damage or destruction from volcanic eruptions, runoff from torrential rain, and typhoon-induced erosion. Current thinking is that the most promising site for new colony establishment is in the Ogasawara group of the Bonin Islands. These islands, located about 1000 kilometers south of Tokyo and 300 kilometers south of Torishima, belong to the Metropolis of Tokyo.

Within the Bonins, initial focus is on the Mukojima Islands group. There are records of short-tailed albatrosses nesting on these islands as recently as the 1920s, including a sizeable colony on Kita no shima. In addition to biological suitability, the selected site must be compatible with existing and anticipated future use, including tourism (H. Suzuki and K. Horikoshi, Institute of Boninology, pers. comm. 2004).

4.1. Conduct feasibility study of other potential colony re-establishment sites

The START team recommended a feasibility study for potential colony reestablishment at its May 2004 meeting. This recommendation was implemented when Japanese researchers made a reconnaissance trip to the Bonin Islands from March 8–19, 2005. Based on the results of this trip, the most favorable site for establishment of a new colony appears to be on the northwestern part of Mukojima. This site was selected for several reasons: (1) short-tailed albatrosses sometimes come to this island; (2) many blackfooted and Laysan albatrosses breed near the site; and (3) access to the island and carrying supplies to this site is easy. Japanese recovery team members are in the process of obtaining permission to set up the colony site on this island (T. Deguchi pers. comm. 2005)

Attempts to characterize the suitability of breeding sites should include an assessment of the following habitat parameters: risk of erosion, colony site aspect, prevailing wind direction, topography, wind shear hazard, plant community, presence/absence of potential predators, presence of introduced species (both plants and animals), ease of access, presence of other nesting seabirds, and observed visits by short-tailed albatrosses. Frequency of human visitation, other socio-political factors, and land status must also be considered, as these affect the ability to conduct artificial colony work.

4.2. Prepare selected new translocation colony site

Any necessary site management, such as removal of invasive plant or animal species should be conducted. Agreement should be reached among the wide range of stakeholders and permission obtained from land owners and government entities to ensure effective site management.

4.3. Attempt passive attraction of birds to new site using decoys and recorded colony sounds *(Ranked number one of the 51 recovery tasks)*

A first (and least costly) means of inducing new colony establishment is to use decoys and a sound system playing back recorded vocalizations from the Tsubame-zaki colony, as has been done at Hatsune-zaki on Torishima. Given the ongoing visits of some albatrosses to the Bonin Island sites, this method alone may suffice in inducing a new short-tailed albatross breeding colony. However, preparatory work towards translocation efforts should proceed simultaneously with this passive attraction effort in case passive attraction alone proves ineffective.

4.4. Conduct surrogate species translocation study

Prior to translocation of short-tailed albatross chicks, biologists should conduct a test translocation using black-footed albatrosses from Torishima. They should be moved to, and reared to fledging at, the intended new short-tailed albatross colony site. This effort will test the effectiveness of translocation methodologies and will help determine the behavior of young albatrosses released into a "social vacuum." This task was ranked number 11 of 51 potential tasks at the 2004 START meeting; however, follow-up discussions held after the May 2004 START meeting, and at the August 2004 START 2.5 meeting in Uruguay, have raised the priority of this task relative to other high-priority tasks.

4.5. Translocate short-tailed albatrosses to new colony site

H. Hasegawa (pers. comm. 2003, 2004) has indicated that up to 10 immature short-tailed albatrosses could be taken for translocation when the Tsubame-zaki population exceeds 200 fledglings per year.

A number of options were considered for accomplishing this task. The recovery team discussed translocating: eggs or newly-hatched chicks, post-guard chicks, or near-fledglings. Each of these options has certain advantages and disadvantages, in terms of the amount of time and energy required for chick rearing, disturbance to breeding birds at Torishima during capture, and the greater or lesser potential for chicks to imprint on humans and to imprint on (and thus return as breeders to) the translocation site. After further discussions with world albatross and seabird experts at an albatross translocation workshop held August, 2004, in Montevideo, Uruguay, the START has concluded that **translocation of post-guard chicks** is the method of choice (see task 4.5.1 below). A more detailed discussion of the alternative translocation methodologies considered is presented below:

Translocation of eggs from Torishima to new island colony site—Obtaining eggs from incubating birds would create minimal disturbance at the Tsubame-zaki colony. Loss of an egg would allow adults to return to sea to forage earlier, presumably increasing their survival rate for that year, and increasing the probability that they would nest the following year. However, raising a chick from hatch to the point of fledging would require: (1) a very specialized diet to achieve proper physiological development; (2) a feeding and socialization process that ensures the chicks are imprinted upon adult albatrosses; (3) far more effort and financial resources devoted to rearing chicks for a longer period. The probability of successfully rearing chicks to the point of fledging, starting from eggs, is likely much lower than if we start with chicks.

Translocation of fledglings from Torishima to new island colony site—Capturing fledglings after the parents have departed from Torishima would be the simplest and least expensive and disruptive way to translocate chicks However, it may also be the least likely to achieve success in establishing a new colony. Chicks will have been raised by parents, which is almost certainly better for the young birds, both physiologically and socially. Capturing pre-flight chicks after the adults have left would be simple and would cause no disturbance to the colony during the active breeding season. However, past experiments with Laysan albatrosses suggests that translocated fledglings return to breed at their natal site, not at their fledging site (Fisher 1971).

4.5.1. Translocation of post-guard chicks from Torishima to new island colony site *(Ranked in the top 10 of 51 recovery tasks)*

This has been determined by the START to be the method of choice and is therefore the official task 4.5.1. In this translocation scenario, chicks would be removed from the colony site as soon as parents begin leaving the chick alone while they both forage at sea. The key assumption to this approach is that geographic imprinting on the nesting island occurs after this time; chicks that fledge from a translocation site will return to breed at their fledging site, not their hatching site. This approach helps minimize the cost of the translocation operation and enhance the probability of success of the rearing effort, in that chicks will not require the very specialized diet of hatchlings and will not need to be tended to for as long. Parental investment in the chicks at this point will have been moderate, and the likelihood that they will have the physiological resources to breed again the following year may be increased by removal of the chick at this stage.

Part of this task entails the training of individuals in caretaking of albatross chicks. Individuals should remain available to conduct this work for a number of years. If possible, training by experts in albatross husbandry techniques (in New Zealand and Hawaii) should be acquired. If this training is not available, detailed observations of short-tailed albatross parental behavior at Tsubame-zaki may be substituted.

After developing good translocation methodologies, the translocation of ten or more chicks per year should continue for at least 5 years. At that time, we may begin to determine if translocated chicks return to their release site, or the site at which their parents deposited them as eggs. A proportion of translocated individuals could be followed via telemetry to determine their movements, compared with the movements of "control" birds from Torishima Island.

4.5.2. Translocation of fledglings from Tsubame-zaki to Hatsune-zaki colony on Torishima

This translocation effort represents a minimal investment of money and effort. It entails only the movement of near-fledging chicks from one side of Torishima Island (Tsubame-zaki) to the other (Hatsune-zaki) in the hopes that the fledged birds will return to breed at their fledging site rather than their natal site, thus bolstering the breeding population there. The chance of success may be low, given the "super-stimulus" of the main colony nearby, but the risk and costs are also low. This translocation effort could conceivably occur simultaneously with other translocation efforts if the number of chicks at the Tsubame-zaki colony is sufficiently great to allow dual translocation efforts.

4.6. Monitor and maintain new colony site *(Ranked in the top 10 of 51 recovery tasks)*

The translocation site should be monitored annually, to observe nesting rate and fledging success of short-tailed albatrosses. Translocated individuals would not be expected to return for at least 5 years; however, some breeding-age albatrosses could be attracted to the site prior to this time, and pre-breeders could stop in for visits. Decoys and sound systems at these sites should be maintained, and vegetation and vertebrate pest populations (rats, snakes, goats) monitored and controlled.

5.0. Continue research on fisheries operations and mitigation measures. *(Ranked in the top 10 of 51 recovery tasks)*

Great progress has been made in developing seabird bycatch avoidance measures that minimize seabird bycatch in Japanese and Alaskan demersal longline fisheries. This work needs to be continued, and further research conducted on other aspects of commercial fisheries (e.g., pelagic longline and trawl fisheries).

5.1. Conduct fisheries related bycatch reduction research; integrated weight line research

Although some research has been conducted, researchers should conduct further research to develop integrated weighted line technology as a practical and effective seabird mitigation alternative for demersal fisheries.

5.2. Conduct fisheries related bycatch reduction research: trawl gear interaction rate study

Researcher should investigate the frequency of seabird collisions with cables employed in the trawl fishery in Alaskan waters. As part of a Biological Opinion issued by the Service in 2003, NMFS is required to: (1) document whether short-tailed albatross interaction/collision with trawl vessel gear occurs in Alaskan waters, and if so, (2) estimate the rate of such take. A report of the interactions between short-tailed albatross and trawl gear shall be submitted to the Service by December 31, 2006.

5.3. Conduct fisheries related bycatch reduction research: trawl gear interaction minimization study

If investigations conducted in 5.2 reveal adverse effects to seabirds, researchers should develop effective and practical mitigation strategies. Certain methodologies are already being tested (Sullivan et al. 2004). Recent contests by the BirdLife International may reveal additional creative approaches to solving this problem (see Current Research and Recovery Actions above).

5.4. Conduct fisheries related bycatch reduction research: refine domestic and foreign mitigation measures in fisheries

Researchers should develop further refinements to existing mitigation devices and should develop new ones as warranted, particularly relating to pelagic longline and non-U.S.-based fisheries. U.S and Japanese researchers should share information and perhaps even collaborate in research efforts. Through the World Wildlife Fund Bering Sea Program, the Russian longline fleet is gradually accepting the concept of incorporating seabird bycatch reduction measures into their operations, especially as these measures can also save money, through reduction of bait loss. Other similar programs could be extended to other major fisheries in the North Pacific.

5.5. Overlay short-tailed albatross distribution with distribution of Russian, Japanese, and Hawaiian fisheries

This GIS exercise, populated with data from short-tailed albatross telemetry studies and commercial fisheries distribution information, could be valuable in focusing our outreach and management efforts. A pilot effort is being conducted (as of 2005) by Washington Sea Grant Program, for smaller longline vessels in Alaskan waters.

5.5.1. Develop GIS showing fisheries-albatross range overlap in Japanese fisheries

Geographic distribution of Japanese fisheries effort is lacking. It is known, however, that there is notable overlap between this effort and the distribution of short-tailed albatrosses. Analysis of these fisheries data with respect to albatross distribution could lend insights that would aid in management of this species.

5.5.2. Develop GIS showing fisheries-albatross range overlap in Russian fisheries

In 2003, a scientist traveling aboard a Russian demersal longliner reported that the vessel took a short-tailed albatross. Due to the lack of fishery observer data from longline vessels fishing in Russian waters, we do not know the rate at which seabirds or albatrosses are taken in that fleet. We also do not have data on spatial and temporal distribution of fishing effort in Russian waters. We do, however, have some albatross satellite telemetry data that would allow us to analyze potential interaction rates should we obtain such fishery effort data.

5.5.3. Develop GIS showing fisheries-albatross range overlap in Hawaiian fisheries

Although short-tailed albatrosses do not appear to frequent the waters around Hawaii nearly as often as they do around Japan, Russia or Alaska, some individuals do spend time there. These individuals may be at higher relative risk of take due to the prevalence of pelagic longline fisheries in that area. Pelagic longline fisheries take albatrosses at a higher rate than do demersal longline fisheries. Data on spatial and temporal distribution of birds and of fisheries effort in this area would help determine the severity of this potential conflict.

5.5.4. Develop GIS showing albatross range based on sightings from vessels of opportunity

This task is similar in nature to task 3.5; however, this task involves the compilation of opportunistic sightings into a spatial database.

6.0. Conduct Other Research

6.1. Conduct genetic analyses to detect differences between Torishima and Senkaku short-tailed albatrosses *(Ranked in the top 10 of 51 recovery tasks)*

Preliminary genetic analyses of these two albatross populations suggest marked genetic separation of Torishima vs. Minami-kojima populations (H. Higuchi, pers. comm. 2004). Further genetic analyses should be conducted to confirm genetic relationships of birds from these two breeding populations. Such work may also provide an understanding of the severity of genetic effects resulting from population "bottlenecking" that occurred when the species was limited to a very few birds. Genetic profiling of birds may also play a role in selecting which young should be translocated or precluded from translocation.

6.2. Investigate food habits of short-tailed albatross

A more exact idea of what the birds are eating and where they are foraging will allow us to better focus our outreach and management measures for fisheries-related and ocean pollution threats. It will also help us to provide a healthy balance of food to translocated young.

6.3. Conduct contaminants analyses

It is unknown whether and to what extent environmental contaminants may be affecting individual short-tailed albatross health, survival or reproduction. It is also unknown whether contaminants may be having effects upon population growth.

6.3.1. Conduct contaminants analysis on addled eggs, feathers, and dead chicks

These analyses would occur on an "as-available" basis following a standard contaminants sampling and analysis protocol (task 9.4).

6.3.2. Study correlation between black-footed albatross reproductive success and contaminant load (Hg, other metals, persistent organic pollutants [POPs]) as surrogate for short-tailed albatross

Previous studies at Midway have initiated this work.

6.3.3. Overlay STAL distribution with oil tanker routes, high potential oil exploration areas

This information, once obtained, should be relayed to Japan's Maritime Safety Agency and to other appropriate oil tanker traffic regulatory bodies.

6.3.4. Develop oil spill contingency plans for high-risk areas

If investigations reveal particularly high risk areas, conduct outreach that will minimize the probability of, and damage caused by, an oil spill.

6.3.5. Conduct studies with museum specimens

Such studies allow comparisons between current and historical contaminant loads.

6.3.5.1. Compare eggshell thickness of new & museum short-tailed albatross eggs

Different eggshell thicknesses across time may suggest contaminant effects either now or in the past.

6.3.5.2. Compare mercury concentrations between historic and recent short-tailed albatross feathers

Mercury concentrations in seafood are often perceived as a human health issue. Albatrosses may, over their lifetime, bioaccumulate mercury to levels that affect their survival or reproduction.

6.3.6. Continue plastics sampling in waters around Torishima

Plastics have been suspected to have an effect upon albatross chick survival. The sampling of plastic debris around Torishima that has been conducted by Japanese researchers should be continued, and the area kept as free from incoming plastic debris as feasible.

7.0. Conduct other management-related activities

Other miscellaneous management activities that may be necessary to achieve recovery of this species appear below.

7.1. Invite/ encourage participation of Japanese Ministry of Fisheries, and potentially, representatives of Canadian and Russian fisheries organizations, at START meetings

Communication with these agencies, particularly with Japan, is essential in developing a mutual understanding of albatross conservation efforts in these countries and paving the way to interagency and intergovernmental cooperation. Sharing research on seabird-avoidance methodologies will be mutually beneficial.

7.2. Establish a "rapid response slush fund" for immediate, unpredictable needs

Such a fund would prove useful should rapid response to an unpredictable catastrophic event be needed. It is uncertain how such a fund would be set up or managed.

7.3. Complete short-tailed albatross recovery plan; update in 5 years

This plan addresses this task. An updated plan is due in 2010.

7.4. Hold START meeting biennially

Meeting arrangements are difficult and expensive due to the international composition of this recovery team. Although this task does not appear on the ranked list of recovery tasks, it is deemed highly important to ensure continued close communication among those implementing recovery actions.

8.0. Conduct outreach and international negotiations as appropriate

Outreach efforts have been conducted within U.S. fisheries, with apparent success. Such efforts should also be conducted in other nations whose activities may affect, or be affected by short-tailed albatross recovery actions.

8.1. Organize seabird bycatch reduction outreach/ workshops for other countries fishing in North Pacific

The results of U.S. and Japanese research to develop state-of-the-art seabird mitigation measures need to be communicated to those countries with longline fisheries within the range of the short-tailed albatross, and such countries should be encouraged to adopt seabird bycatch avoidance measures.

Outreach efforts may best be accomplished through a combination of workshops or seminars (similar to those in place for the Hawaiian longline fishery), dissemination of outreach materials, and government-to-government communication.

8.2. Maintain list of formal international outreach opportunities

Attending such meetings, or providing information to our meeting delegates would foster international understanding and cooperation in implementing state-of-art seabird bycatch reduction methods. Example meetings include: IFF3, U.S.-Japan Bilateral Fishery meeting, Intergovernmental Consultative Committee, and Bilateral Migratory Bird Treaty meetings with Japan and Russia).

8.3. Create outreach materials for international meetings

The team indicated that Powerpoint presentations, a flashy pamphlet of "top 10 STAL recovery actions" and other outreach material should be prepared for delegates to bring to meetings such as those identified in task 8.2.

8.4. Conduct outreach concerning ocean pollution

Plastic debris (which is ingested and passed on to nestlings with a high frequency) and oil spills are likely the most detrimental known sources of contamination to short-tailed albatrosses. These threats may be minimized through outreach efforts, identification of potential pollution point sources, and by implementing oil spill contingency plans, particularly in areas of high albatross and vessel use.

8.5. Translate important documents into Japanese, English

This draft recovery plan is being translated into Japanese, and a final plan will also be translated. If Russian participation in the Team increases in the future, Russian translations may also be required. Any seminal Japanese documents that are currently unavailable in English should also be translated.

8.6. Pursue additional support from Japanese government

Discuss options for additional collaboration and problem-solving at bilateral migratory bird treaty meetings and other appropriate venues.

9.0. Develop models and protocols as needed

To ensure comparable results between separate studies and across time, sampling and analytical protocols are needed. Existing models have already proven useful for consultation and recovery planning (Cochrane and Starfield 1999; Appendix 1).

9.1. Develop/refine Population Viability Analysis

Thorough population modeling is helpful in developing realistic and measurable recovery criteria (e.g., how many individuals reproducing at what rate, in how many separate locations, are required to constitute recovery?). Demographic parameters need to be determined to make the model accurate and useful. Specifically, we need to refine estimates of fledging-to-breeding survivorship, percentage of non-breeding adults, and adult survival rates.

9.2. Develop protocol for necropsy/carcass processing

A protocol needs to be developed and adopted to ensure that the maximum amount of information is extracted from any short-tailed albatrosses accidentally killed or found dead. The protocol would include methods for preparing samples for analyses of contaminant load, diet, genetic make-up, and evidence of disease or parasites.

9.3. Develop protocols for field handling

This protocol would ensure that future researchers collect data in a manner least disturbing to breeding birds and most compatible with previous data collection.

9.4. Develop protocol(s) for contaminants sampling

Protocols would ensure that data and samples collected by various researchers in different places are accomplished with maximal consistency. Several different protocols may be required for sampling different contaminants (e.g., plastics vs. pesticides).

9.5. Develop protocol for research methodologies (e.g., plastics sampling at colony site)

Consistent research methods are essential to facilitating repeatability of a study, which allows for measurement of trends across time.

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Implementation Schedule

The Implementation Schedule that follows outlines actions and estimated costs for the short-tailed albatross recovery program as set forth in this recovery plan. It is a guide for meeting the objectives discussed in this plan. This implementation schedule indicates action priority numbers (defined below), action numbers from the narrative outline, START action rank, listing factors (defined below) action descriptions, anticipated duration of actions, responsible parties, and lastly, estimated costs. The initiation and completion of these actions is subject to the availability of funds, as well as other constraints affecting the parties involved.

The listing of a party in the implementation schedule does not require, nor imply a requirement, that the identified party has agreed to implement the action(s) or to secure funding for implementing the action(s).

Definition of Action Priorities

Priority 1 — An action that must be taken to prevent extinction or prevent the species from declining irreversibly in the foreseeable future.

Priority 2 — An action that must be taken to prevent a significant decline in species population or habitat quality, or some other significant negative impact short of extinction.

Priority 3 — All other actions necessary to meet the recovery objectives.

Definition of Action Durations

Continual (C) — An action that will be implemented on a routine basis once begun.

Ongoing — An action that is currently being implemented and will continue until no longer necessary.

Periodic — An action that will be conducted one or more times on an as-needed basis.

To Be Determined (TBD) — The action duration is not known at this time or implementation of the action is dependent on the outcome of other recovery actions.

Acronyms used in the Implementation Schedule

Bonin — Institute for Boninology

FWS — U.S. Fish and Wildlife Service

JMOE – Japanese Ministry of the Environment

JFA — Japanese Fisheries Agency

NGO — Non-government organization

OSU — Oregon State University

TBD — To be determined (i.e. Not known at this time

Toho — Toho University

Tokyo — Tokyo Metropolitan Government

UMass — University of Massachusetts

WSGP — Washington Sea Grant Program

WWF — World Wildlife Fund

YIO — Yamishina Institute for Ornithology

Listing Factors Addressed by Each Task

A — The present or threatened destruction, modification, or curtailment of species' habitat or range.

B — Overutilization for commercial, recreational, scientific, or educational purposes.

C — Disease or predation.

D — The inadequacy of existing regulatory mechanisms (i.e., laws).

E — Other natural or manmade factors affecting species' continued existence.

The Implementation Schedule serves a number of functions in a Recovery Plan. It is used to prioritize tasks; it establishes an initial timeframe for accomplishing tasks; it allows tracking of recovery accomplishments. The Implementation Schedule also estimates costs of tasks, and it can be used to obligate funds. Although it identifies "Responsible Parties" (i.e. those entities in the best position to implement the action), it does not obligate any party to provide funding or implement the action. The following table lists only the most detailed level tasks under each heading.

							Action Expenses (in thousands)						
Action Number	START Rank	Priority	Listing Factor1	Action Description	Action Duration	Responsible Party	FY 1	FY 2	FY 3	FY 4	FY 5	5 Year Total	Comments/Notes
1.1	2	1	A-E	Continue annual monitoring of Tsubame-zaki and Hatsune-zaki on Torishima (active pairs, eggs, fledglings)	Ongoing	Toho, YIO	5	5	5	5	5	25	
1.2	33	3	A-E	Prepare protocols for population monitoring data collection (1st breeding age, % adults breeding, baseline pop info., behavior)	1 year		10					10	
1.3.1	14	2	A	Torishima erosion control; dig new drainage swale at Tsubame-zaki	1 year	Tokyo, JMOE		500				500	
1.3.2	21	2	A	Torishima erosion control; maintain existing gabions above Tsubamezaki colony	4 years	Tokyo, JMOE, YIO	30	30	30	30		120	
1.4	3	1	A	Conduct decoy & sound system maintenance at artificial colonies	Annual	YIO	4	4	4	4	4	20	
1.5.1	12	3	A-E	Develop and deploy abrasion-resistant leg band (titanium, Darvic)	2 years/ ongoing	Toho	15	15	3	3	3	39	2-year development; deployment ongoing
1.5.2	7	3	A-E	Develop and deploy color (or readable stainless) bands for Tsubame-zaki colony	1 year/ ongoing	Toho	15	3	3	3	3	27	1-year development; deployment ongoing
1.5.3	14	3	A-E	Continue assistance with color banding operations on Torishima	Ongoing	Toho, YIO	0	0	0	0	0	0	This will result in savings due to shorter vessel charter time
2	4	1	A-E	Monitor Senkaku population (2 trips per year by politically neutral NGO).	Ongoing/ periodic	NGO, TBD	90			50		140	Would be conducted every third year
3.1.1	5	1	A-E	Conduct Torishima telemetry work; breeders during breeding season	3 years	Toho, OSU, UMass		50	50	50	50	200	
3.1.2	18	2	A-E	Conduct Torishima telemetry work; fledglings, sub-adults, post-breeders	5 years	YIO, OSU, UMass	50	50	50	50	50	250	
3.2	19	2	B-D	Conduct at-sea capture and telemetry to determine marine distribution during non-breeding season	2 years	OSU, FWS		150		150		300	
3.3.1	26	2	B	Conduct PTT attachment evaluation (harness types, glue, tape)	3 years	OSU	5	4	4			13	
3.3.2	31	2	B-D	Evaluate / deploy archival tags (involves recapture)	3 years	OSU, YIO		30	25	25		80	

Action Number	START Rank	Priority	Listing Factor1	Action Description	Action Duration	Responsible Party	Action Expenses (in thousands) FY 1	FY 2	FY 3	FY 4	FY 5	5 Year Total	Comments/Notes
3.4	44	3	B	Develop clear goal statement of telemetry work	1 year	OSU, YIO	1					1	
3.5	50	2	A,B,D,E	Determine at-sea distribution; get assistance from an NGO to organize international data collection from ships of opportunity	Ongoing	WWF/ TBD		5	5	5	5	20	
4.1	16	1	A	Conduct feasibility study of other potential colony re-establishment sites	2 years	Toho	40					40	Japanese scientists and officials will determine most feasible site
4.2	12	1	A	Prepare selected new translocation colony site (including arranging access, government permits, local outreach, building construction)	1 year	Toho, YIO, Bonin		140				140	
4.3	1	1	A	Attempt passive attraction of birds to new site using decoys and recorded colony sounds	1 year & ongoing	Toho, YIO, Bonin	120	10	10	10	10	160	
4.4	11	1	A	Conduct surrogate species translocation study (best age for translocation, hand rearing at colony site devoid of adults)	2 years	Toho, YIO, Bonin	150	150				300	
4.5.1	7	1	A-E	Translocation of post-guard chicks from Torishima to new island colony site	5+ years	Toho, YIO, Bonin			150	150	150	450	Moving eggs and fledglings were also considered, but post-guard chick stage could have a greater chance of success.
4.5.2	23	2	A-E	Translocation of fledglings from Tsubame-zaki to Hatsune-zaki colony on Torishima	5 years	Toho YIO Bonin			2	2	2	6	.
4.6	10	1	A	Monitor and maintain new colony site	10 years	Toho YIO Bonin		20	20	20	20	80	
5.1	7	2	B-D	Conduct fisheries related bycatch reduction research; integrated weight line research	2 years	WSGP	*	*	20				*Funding has already been provided by FWS for FYs 1 and 2
5.2	7	2	B-D	Conduct fisheries related bycatch reduction research; trawl gear interaction rate study	2 years	WSGP, NMFS		55	55			110	$100K to NMFS from NPRB for this and task 5.3
5.3	7	2	B-D	Conduct fisheries related bycatch reduction research; trawl gear interaction minimization study	Ongoing	WSGP, NMFS	**	60	30			90	**Funding also provided by FWS for FY 1

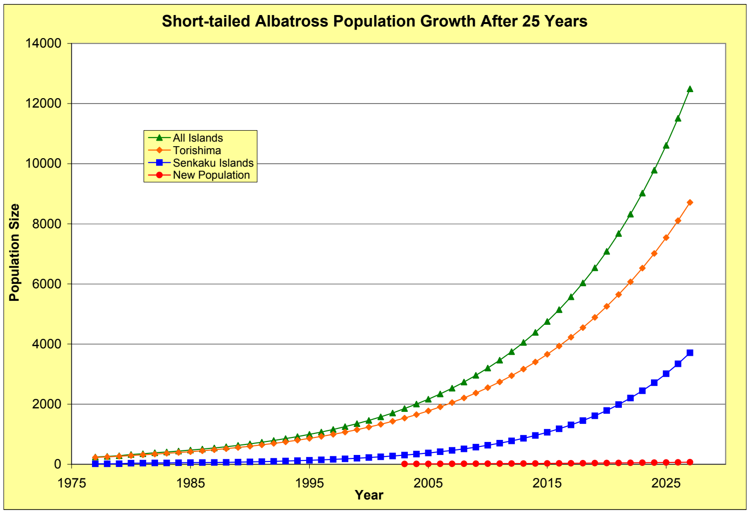
Action Number	START Rank	Priority	Listing Factor1	Action Description	Action Duration	Responsible Party	Action Expenses (in thousands) FY 1	FY 2	FY 3	FY 4	FY 5	5 Year Total	Comments/Notes
5.4	7	2	B-D	Conduct fisheries related bycatch reduction research; refine domestic and foreign mitigation measures in fisheries	Ongoing	WSGP, WWF, JMOE	50	50	50	50	50	250	
5.5.1	26	2	B-D	Develop GIS showing fisheries-albatross range overlap in Japanese fisheries	2 years	TBD			20	20		40	
5.5.2	33	2	B-D	Develop GIS showing fisheries-albatross range overlap in Russian fisheries	2 years	TBD			TBD	TBD			
5.5.3	37	2	B-D	Develop GIS showing fisheries-albatross range overlap in Hawaiian fisheries	2 years	TBD			TBD	TBD			
5.5.4	32	2	B-D	Develop GIS showing albatross range based on sightings from vessels of opportunity	ongoing	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
6.1	6	1	E	Conduct genetic analyses to detect differences between Torishima and Senkaku STAL	3 years	TBD			40	30	30	100	
6.2	16	2	E	Investigate food habits of STAL	3 years	TBD			20	20	20	60	
6.3.1	26	2	A,D,E	Conduct contaminants analysis on addled eggs, feathers, and dead chicks	Ongoing	TBD	2	2	2	2	2	10	
6.3.2	23	2	A,D,E	Study correlation between BFAL reproductive success and contaminant load (Hg, other metals, POPs) as surrogate for STAL	2 years	TBD	25	25				50	
6.3.3	44	3	A,D,E	Overlay STAL distribution with oil tanker routes, high potential oil exploration areas and relay information to Japan's Maritime Safety Agency	1 year	TBD			30			30	
6.3.4	37	3	A,D,E	Develop oil spill contingency plans/conduct outreach for high-risk areas	4 years.	FWS, JMOE, TBD		20	20	20	20	80	
6.3.5.1	44	3	A,D,E	Compare eggshell thickness of new & museum STAL eggs	1 year	TBD				35		35	
6.3.5.2	50	3	A,D,E	Compare mercury concentrations between historic and recent short-tailed albatross feathers	1 year	TBD			50			50	
6.3.6	44	2	A,D,E	Continue plastics sampling in waters around Torishima	Ongoing	Dr. Ogi	TBD	TBD	TBD	TBD	TBD	TBD	
7.1	37	2	B-D	Invite/ encourage participation of Japanese Ministry of Fisheries at START meetings	1 year/ Ongoing	JMOE, JFA	3	3	3	3	3	15	

Action Number	START Rank	Priority	Listing Factor1	Action Description	Action Duration	Responsible Party	Action Expenses (in thousands) FY 1	FY 2	FY 3	FY 4	FY 5	5 Year Total	Comments/Notes
7.2	44	3	A-E	Establish "rapid response" slush fund for immediate, unpredictable needs	1 year	TBD		80				80	Unsure of mechanism to keep this money available if from U.S.
7.3	Not rated	2	A-E	Complete short-tailed albatross recovery plan; update in 5 years	2 years	FWS		15	15			30	
7.4	Not rated	2	A-E	Hold START meeting biennially	Ongoing	FWS		20		20		40	AFWFO has already spent $40K on this
8.1	26	2	A-E	Organize seabird bycatch reduction outreach/ workshops for other countries fishing in North Pacific	Ongoing	FWS			7	7	7		IFF conferences, and other venues
8.2	33	2	B,D,E	Maintain list of formal international outreach opportunities to foster international cooperation in implementing state-of-art seabird bycatch reduction methods & conduct outreach	Ongoing	TBD		5	5	5	5	20	
8.3	42	2	B,D,E	Create outreach materials for international meetings	Periodic	FWS	5		3		3	11	
8.4	50	2	A,C,D,E	Conduct outreach concerning ocean pollution	Ongoing	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
8.5	37	2	E	Translate important documents into Japanese, English	Ongoing	FWS	5	2	2	2	2	13	
8.6	33	2	A,B,D,E	Pursue additional support from Japanese government (through bilateral migratory bird treaty or other means)		FWS, JMOE	0	0	0	0	0	0	Done in conjunction with other meetings.
9.1	21	2	A-E	Develop/refine Population Viability Analysis	1 year	UMass	TBD						
9.2	42	3	A-E	Develop protocol for necropsy/carcass processing	1 year	TBD		8					
9.3	26	2	A-E	Develop protocols for field handling	1 year	OSU, YIO, UMass		8					
9.4	37	3	A-E	Develop protocol for contaminants sampling	1 year	TBD		8					
9.5	44	3	A-E	Develop protocol for research methodologies (e.g. plastics sampling at colony site)		TBD		8					

Appendix 1

Deterministic Population Model

This is a visual representation of a model developed by Dr. Paul Sievert, START member. The model allows users to vary the magnitude and timing of potential volcanic events and predict resultant population effects. Working copies of this model are available from Dr. Sievert.



Volcanic Effects - Torishima

Year of Eruption	
Season of Eruption (1-8)	
Adults Surviving	
Subadults Surviving	
Eggs Surviving	
Chicks Surviving	
Breeding after Eruption	
1 Year After	
2 Years After	
3 Years After	
4 Years After	
5 Years After	

			Season of Eruption				
1	2	3	4	5	6	7	8
Arrival (Oct)	Incubation (Nov-Dec)	Brooding (Jan)	Early Chick (Feb)	Mid Chick (Mar-Apr)	Late Chick (May-Jun)	Absent (Jul-Sep)	No Eruption
0.80	0.60	0.60	0.90	0.95	0.98	1.00	1.00
0.95	0.80	0.60	0.50	0.40	0.90	1.00	1.00
1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00
0.20	0.05	0.05	0.25	0.30	0.35	0.45	1.00
0.40	0.20	0.20	0.45	0.50	0.55	0.65	1.00
0.50	0.40	0.40	0.65	0.70	0.75	0.85	1.00
0.70	0.60	0.60	0.75	0.80	0.85	0.93	1.00
0.85	0.80	0.80	0.90	0.95	0.95	0.97	1.00

TORISHIMA

Population Parameters

Reproductive Success		0.640
Annual Survival:	Subadults	0.941
	Adults	0.967
Proportion Breeding		0.750
Bycatch rate:	Subadults	0.000
	Adults	0.000

Model Predictions

Population Growth Rate =	0.000
Pop. Size in 25 yrs (2027) =	0

SENKAKU ISLANDS

Population Parameters

Reproductive Success		0.750
Annual Survival:	Subadults	0.965
	Adults	0.980
Proportion Breeding		0.800
Bycatch rate:	Subadults	0.000
	Adults	0.000

Model Predictions

Population Growth Rate =	0.000
Pop. Size in 25 years (2027) =	0

NEW ISLAND (BONIN?)

Population Parameters

Reproductive Success		0.640
Annual Survival:	Subadults	0.941
	Adults	0.967
Proportion Breeding		0.750
Bycatch rate:	Subadults	0.000
	Adults	0.000

Model Predictions

Population Growth Rate =	0.000
Pop. Size in 25 yrs (2027) =	0

COMBINED POPULATIONS

Population Parameters

Reproductive Success		0.695
Annual Survival:	Subadults	0.953
	Adults	0.974
Proportion Breeding		0.775
Bycatch rate:	Subadults	0.000
	Adults	0.000
		0.000

Model Predictions

Population Growth Rate =	0.000
Pop. Size in 25 years =	0

Appendix 2

Bird /Aircraft Interactions at Midway Island, USA

Requirements

Transient aircraft (primarily U.S. Military or U.S. Coast Guard C-130s) are required to obtain prior permission before landing at Midway Atoll NWR. Aircraft are advised to land within the parameters provided by airfield operations to reduce air collisions with seabirds.

Prior to any aircraft landing or take-off, 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 100 meters downwind of the active runway by refuge and American Airports (AA) staff. Refuge and AA staff also remove birds that occur upwind of the runway because they have the potential of flying into the path of the oncoming plane. If Refuge staff encounters “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 of about 100 meters downwind of the active runway.

Due to the size of the runway at Midway Atoll NWR, refuge and AA 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. As many as six vehicles and 20 staff and volunteers are engaged in the pre-landing or pre-take-off sweep process (R. Dieli, pers. comm. 2000). Finally, bird activity advisories are provided to pilots and recommendations are suggested to modify approaches and landings at the airfield to avoid collisions with birds.

Data Collection

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 (Table A2 - 1). Although the data suggest a significant increase in bird strikes in 1999 compared to 1998, this is likely due, in part, to more thorough search and improved documentation by airport personnel.

Table A2 - 1. Bird-aircraft interactions recorded at Henderson Field, Midway Atoll, during 750 evolutions (take-offs or landings), July 1997 to June 2000.

Time interval	Evolutions	No. of strikes	No. of birds struck	No. Albatrosses struck
Jul-Dec 1997	68	13	13	3
1998	299	27	31	21
1999	301	49	78	35
Dec-May 2000	80	17	22	19

Appendix 3

Color Band Schedule for Short-tailed Albatrosses Banded on Torishima Island by Dr. Hiroshi Hasegawa

Banding Records of the short-tailed albatrosses, *Phoebastria albatrus*, on Torishima. Japan. All the birds were banded as chicks by Hiroshi Hasegawa*

	Layout			
Date	Left Leg	Right Leg	Metal Band Serial Number	Plastic Band Color and Number
20 Mar. 1977		metal	130-00251 to 00265	
20 Mar. 1979	plastic	metal	130-00501 to 00524	White 000 to 029
19 Mar. 1980	plastic	metal	130-00801 to 00820	Red 000 to 027
20 Mar. 198l	plastic	metal	130-01201 to 01234	Blue 000 to 042
24 Mar. 1982	plastic	metal	130-01310 to 01330	Yellow 000 to 028
20 Mar. 1983	plastic	metal	130-01531 to 01564	Orange 000 to 041
14 Apr. 1984	plastic	metal	130-01565 to 01596	Green 000 to 039
17 Mar. 1985	plastic	metal	130-01597 to 01647	Black 000 to 057
14 Apr. 1986	metal	plastic	130-01648 to 01695	White 030 to 087
14 Apr. 1987	metal	plastic	130-01696 to 01748	Red 028 to 087
11 Apr. 1988	metal	plastic	130-01901 to 01958	Blue 043 to 122
19 Apr. 1989	metal	plastic	130-01959 to 02000	Yellow 029 to 085
18 Apr. 1990	metal	plastic	130-04151 TO 04201	Orange 042 to 111
15 Apr. 1991	metal	plastic	13A 0501 to 0566	Green 040 to 128
21 Apr. 1992	metal	plastic	13A 0567 to 0617	Black 058 to 130
8 Apr. 1993	plastic	metal	13A 0701 to 0772	Black 131 to 185
16 Apr. 1994	plastic	metal	13A 0801 to 0879	Orange 112 to 148 Red 092 to 115 Green 129 to 151
21 Apr. 1995	plastic	metal	13A 0880 to 0961	Red 000 to 056 Blue 000 to 040
19 Apr. 1996	plastic	metal	13A 0962 to 1023	Yellow 000 to 083
24 Apr. 1997	plastic	metal	13A 1024 to 1113	Orange 000 to 110 Blue 041 to 046
23 Apr. 1998	metal		13A 1114 to 1243	
25 Apr. 1999		metal	13A 1244 to 1384	
24 Apr. 2000		metal	13A 1385 to 1500 13A 6951 to 6981	
27 Apr. 2001		metal	13A 6982 to 7150	
24 Apr. 2002		metal	13A 7501 to 7659	
7 May 2002	plastic	metal	13A 7660	Blue 138 at Kita-kojima in the Senkaku Islands

Notes:
1) Plastic bands have inscribed numerical figures on two sides of the band: White and Yellow colored bands have black figures; Red, Blue, Orange, Green, and Black bands have white figures; Red and Blue (indicated by italic) bands have yellow figures. 2) Metal bands have a serial number of the Japanese Bird Banding Scheme sponsored by Ministry of the Environment of Japan (=Kankyosho in Japanese). For example: Kankyosho Tokyo Japan 130-00251 or Kankyosho Tokyo Japan 13A 1243

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Appendix 4

Summary of Short-tailed Albatross Satellite Telemetry Studies

METHODS

From May through November, 1996-2003 (excluding 1999 & 2000), 30 Short-tailed Albatrosses (STAL) were tagged with satellite platform transmitter terminals (PTT) to determine their post-breeding migration patterns. Transmitters were attached using Tesa tape or epoxy during five years (1996-98 & 2002-03, n = 27 birds) and harnesses in 1 year (2001, n = 3 birds). Deployment duration for any one bird ranged from 2 to 138 days. Sixty-three percent of these deployments (n = 19 birds) provided continuous tracking data lasting longer than one month (median = 87 days per bird) for a total of more than 8,800 locations.

Age composition was approximately 35 % adult plumage (> ~ 9 yr), 47% subadult (~ 3 – 8 yr), and 18% juvenile (< 2 yr). Note that reference to subadult plumage does not imply birds are too young to breed; birds in this age range have been observed breeding and successfully raising chicks.

Deployment of all but four PTTs occurred at the Tsubame-zaki colony on Torishima, Japan. Captures at Torishima occurred in May and deployment periods extended to mid-September. In 2003, four PTTs were also deployed on STAL captured at-sea in the Aleutian Islands, Alaska. The at-sea deployments occurred in August and extended to the end of November.

PTTs weighed 30 – 90 g and were programmed to transmit on a duty cycle of either 8-hr-on then 24-hr-off or 6-hr-on then 18-hr-off (one additional PTT was programmed for 8-hr-on then 8-hr-off, but deployment duration was only 15 days).

SUMMARY OF AT-SEA DISTRIBUTION

Upon leaving Torishima, all birds flew to the east coast of Japan, concentrating primarily off the coast of Honshu between Tokyo and Sendai. From here, further migration seemed to follow two general patterns, exemplified by data from four birds in 2002. Two of these birds flew east, offshore of Japan and the continental shelf then directly north, arriving at the Aleutian Islands, Alaska (USA), by 15 June. Once at the Aleutian Islands, the birds began traveling east, one remaining over the continental shelf and slope and within passes between islands (Figure 1) and the other moving farther offshore (Figure 1). In contrast, the two other albatrosses remained along the east coasts of Honshu and Hokkaido with one venturing up to the southern Kurile Islands, Russia. For nearly three months they remained in these areas, traveling north and south along the coasts (Figure 2). In early September they too began to move north and east toward the Aleutian Islands. However, they spent considerable time in the Kurile Islands and southern Kamchatka Peninsula (Russia) along the way.

Tracking data of birds from Torishima in 2001 and 2003 showed similar migration paths (Figures 3 and 4, respectively). In 2003, however, most birds traveled particularly rapidly to the Aleutian Islands, five of the seven birds reaching the Aluetians by 30 June. Also, birds tracked from Torishima in 2001 and 2003 spent less time in the Kurile Islands and moved further north into the Bering Sea compared to birds tracked in 2002.

Albatrosses captured at-sea in the Aleutian Islands likewise spent considerable time along the central Bering Sea shelf break, in addition to the eastern Kamchatcka Peninsula and Aleutian Islands (Figure 5). After circumnavigating much of the Bering Sea, one of the hatch-year birds traveled along the Aleutian Islands, then south from the Alaska Peninsula and east to the coast of British Columbia and Washington State. The bird then traveled south to northern California before turning north again when we lost contact with it off Washington.

Analysis of marine habitats used and environmental factors affecting STAL movement patterns are currently in progress. Even at this stage, however, it is evident that STAL locations are especially concentrated along continental shelf break and slope regions. Therefore, it is not surprising that most of the birds' time at sea is spent within the Exclusive Economic Zones (EEZ) of North Pacific Rim countries. For example, 50% of the locations obtained in 2003 were within the Alaska EEZ (Figure, 6). In summary, each Short-tailed Albatross spent varying amounts of time in different areas of Japanese, Russian, Canadian, and American waters, signifying the complexity and importance of international collaboration in the at-sea conservation of this species.

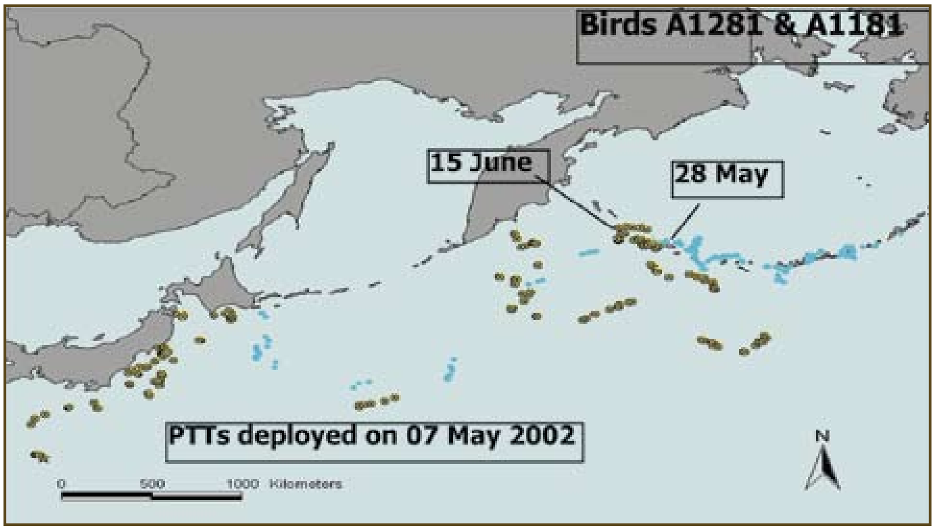

Figure A4-1. Two STAL tracked from Torishima in 2002 that moved rapidly up to the Aleutian Islands.

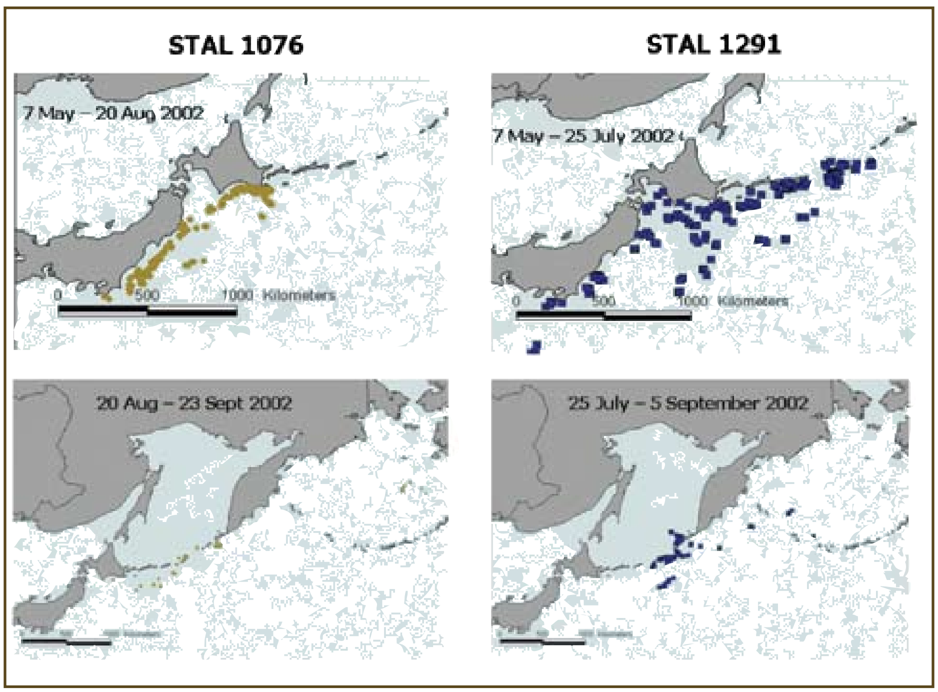

Figure A4-2. Two STAL tracked from Torishima in 2002 that did not move into the Aleutian Islands and Bering Sea until later in the summer.

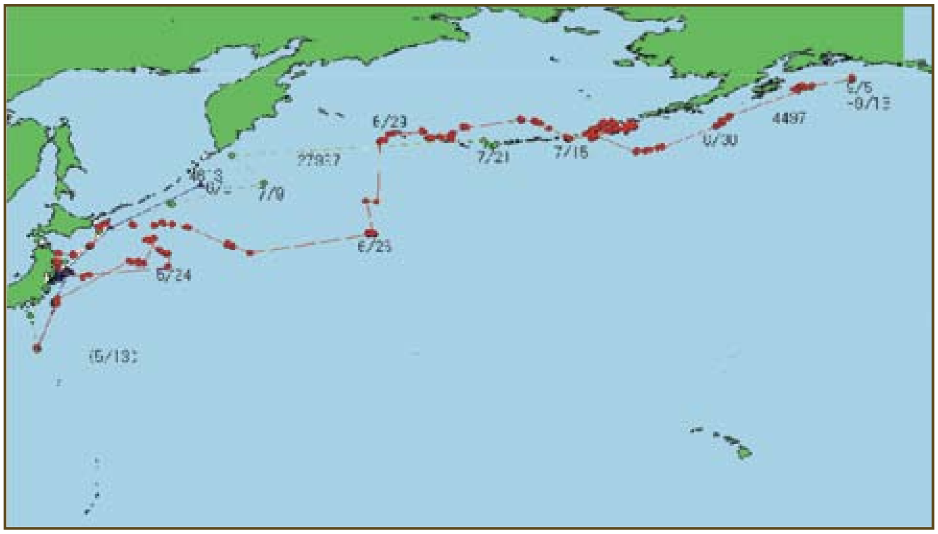

Figure A4-3. STAL tracked from Torishima in 2001

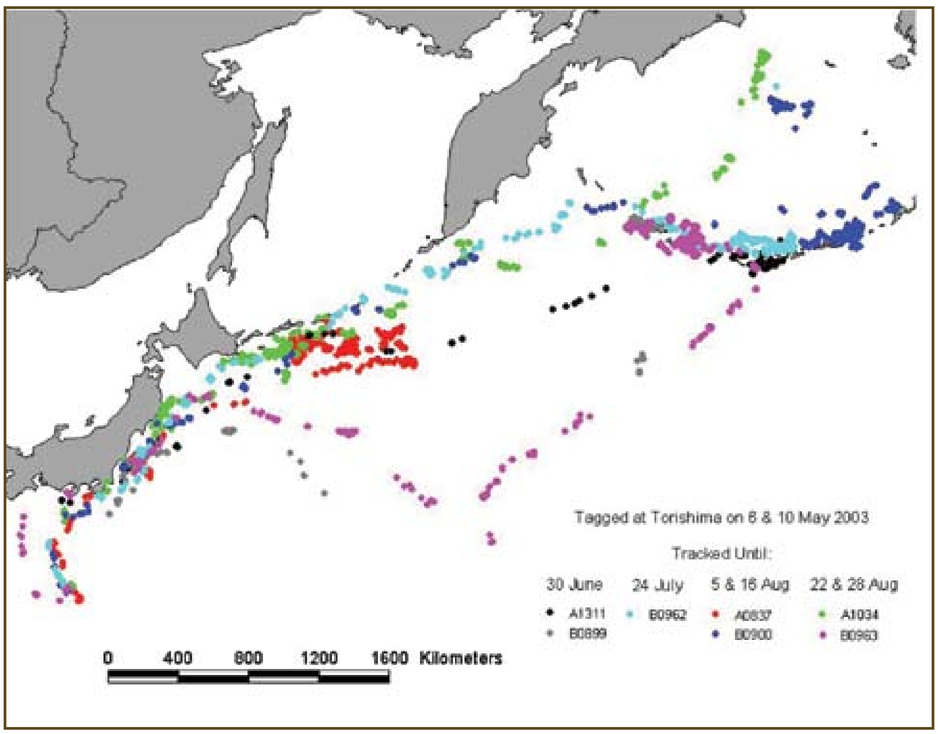

Figure A4-4. STAL tracked from Torishima in 2003.

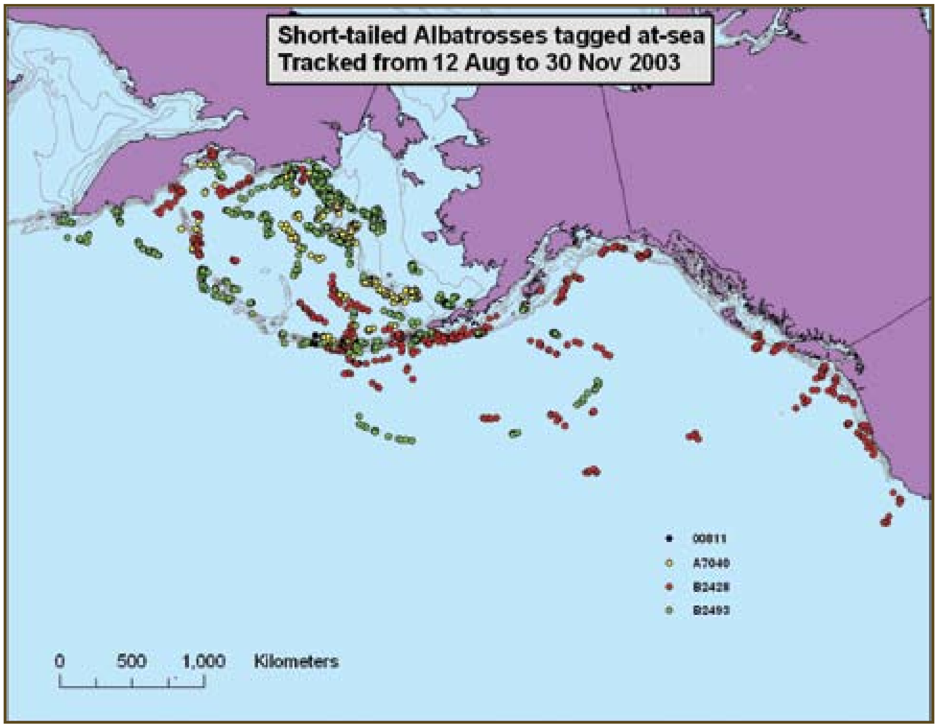

Figure A4-5. Four STAL captured and tagged in the Aleutian Islands in 2003.

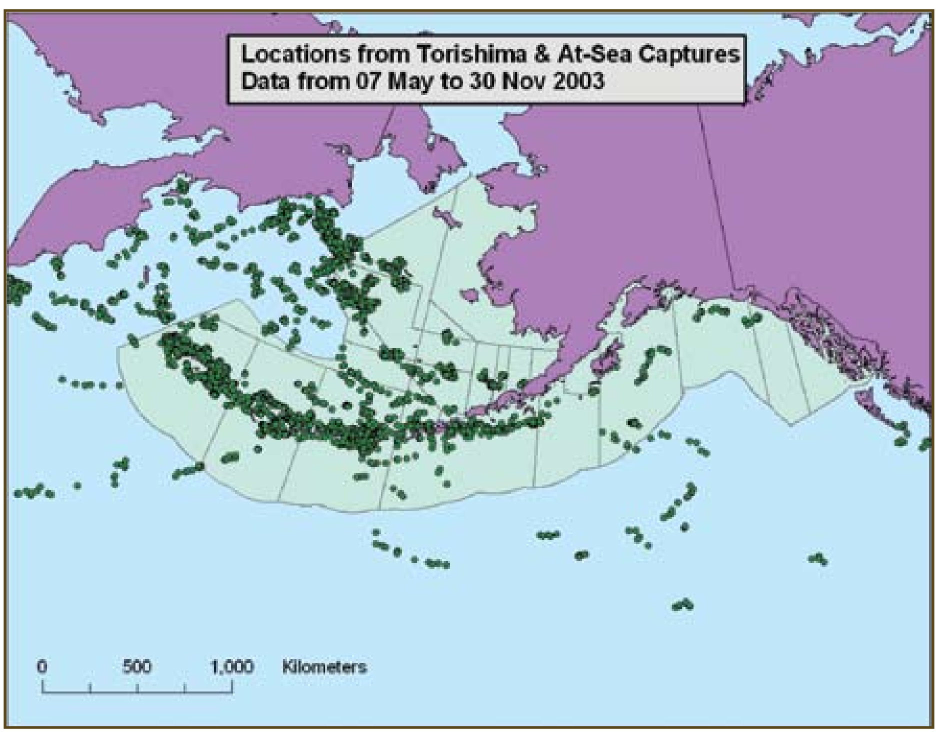

Figure A4-6. STAL locations from 2003 and Alaska EEZ and reporting zones.

Appendix 5

Short-tailed Albatross Conservation and Breeding Project Program

26 November
1993 Ministry of the Environment, Government of Japan

1. Project target

At one time a large number of Short-tailed Albatross bred on the isolated island such as Izu Islands and far west of Ogasawara Islands. But their population was decreased by overcatching, and they were considered extinct in those days. After that, they were re-discovered on Torishima Island in the Izu Islands in 1940's. As of 1993 their population is estimated at approximately 600. The breedings of this species were confirmed on only two places such as Torishima Island in Izu Islands and Minami-kojima Island in Senkaku Islands, and almost of them bred on the steep slope gradually of southern extremity of Torishima Island.

This project is aiming to keep and improve the environmental condition of existing breeding sites so as to expand the breeding colony by producing new breeding sites for this species stable survival for future.

2. Area of this project: Torishima Island, Tokyo

3. Project outline

1) Improvement of the breeding sites

(1) Improvement of the existing breeding site

The existing breeding site should be maintained and be improved from the instability situation such as a landslide, which is located on the steep slope gradually of southern extremity of Torishima Island. Concretely, efforts will be made to remove the piled sand from the breeding site to build the facility to protect the site from earth and sand, and to ease the slope of the breeding site and to plant the native species for the stable environment of their breeding site.

(2) Establishment of a new breeding site

The existing breeding site is not good condition, for example, area suitable for breeding is small, geographical feature condition is not tender, etc. Also the existing one will be in danger of big damage such as typhoon in the future. In this context, a new breeding site shall be established, besides the existing one, on the steady and safety area. Therefore the new breeding site will be established by sub-adult of this species that will be led by decoys or tape-recorded song.

2) Research for grasp of live situation of Short-tailed Albatross

The research of Short-tailed Albatross on their distribution, home range, habitat and breeding status shall be continuously conducted for adequate and effective implementation of this program. And also the young individuals which leave the nest will be banded for individual discrimination.

An influence by blocking factors such as alien species ; roof rat (Rattus rattus) etc.; for Short-tailed Albatross shall be grasped, and measures will be taken as the occasion demands.

3) Promote awareness / enlightenment

Public awareness and enlightenment on their habitat, necessity of conservation of this species, and situation of this project implementation shall be promoted for understanding of people widely.

Appendix 6

National Marine Fisheries Service Regulation for Seabird Avoidance in Longline Fisheries

(see 69 FR 1930-1951 for complete details)

Summary of National Marine Fisheries Service regulations for seabird avoidance in longline fisheries

- Vessels over 55 ft length overall (LOA) in the Exclusive Economic Zone (EEZ) would be required to use paired streamer lines of specified performance and materials standards.
- Vessels 26 ft LOA to 55 ft LOA would be required to use less stringent measures such as a buoy bag line or single streamer line – each with its own specified performance and materials standards. The requirement would depend upon fishing location (“Inside’ or EEZ, where “Inside’ is Prince William Sound, Southeast Inside District, and state waters of Cook Inlet), vessel type (if masts, poles, or rigging on vessel), and gear type (if snap gear used).
- The performance and material standards for measures required on smaller vessels would be guidelines for an interim one-year period, at which time they would become required.
- Directed discharge (through chutes, pipes, or other similar devices suited for purpose of offal discharge) of residual bait or offal from the stern of the vessel while setting gear would be prohibited.
- A Seabird Avoidance Plan would be required onboard the vessel.
- Vessels less than or equal to 32 ft LOA fishing for halibut in International Pacific Halibut Commission (IPHC) Area 4E within 0 to 3 miles of shore would be exempt from measures.
- Vessels less than or equal to 26 ft LOA would continue to be exempt from seabird avoidance measures.

In consideration of existing regulations, the council recommended that operators of all applicable vessels using hook-and-line gear must:

A. Use hooks that, when baited, sink as soon as they are put in the water;

B. Prohibit directed discharge (through chutes, pipes, or other similar devices suited for purpose of offal discharge) of residual bait or offal from the stern of the vessel while setting gear. This prohibition of directed discharge of bait is not to be confused with strategic offal discharge (i.e. discharge in a manner that distracts seabirds from baited hooks), which is allowed.

C. Remove embedded hooks in bait/offal that is to be discharged;

D. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird.

Current Requirements for Vessels using Hook-and-Line (i.e. longline) gear in the Groundfish and Halibut Fisheries off Alaska.

These requirements reflect a revision to previous requirements and were published in the Federal Register Vol. 69 pages 1930-1951, on January 13, 2004.

Who Must Use the New Seabird Avoidance Measures?

Seabird avoidance measures apply to the operators of vessels longer than 26 ft LOA using hook-and-line gear for:

- Pacific halibut in the Individual Fishing Quota (IFQ) and Community Development Quota (CDQ) management programs (0 to 200 nautical miles (nm)),
- IFQ sablefish in EEZ waters (3 to 200 nm) and waters of the State of Alaska (0 to 3 nm), except waters of Prince William Sound and areas in which sablefish fishing is managed under a State of Alaska limited entry program (Clarence Strait, Chatham Strait), and
- groundfish (except IFQ sablefish) with hook-and-line gear in the U.S. EEZ waters off Alaska (3 to 200 nm).
- Other than noted above, vessel operators using hook-and-line gear and fishing for groundfish in waters of the State of Alaska must refer to seabird avoidance measures in State regulations.
- Exemption: Operators of vessels 32 ft (9.8 m) LOA or less using hook-and-line gear in IPHC Area 4E in waters shoreward of the EEZ are exempt from seabird avoidance regulations.

What are the New Seabird Avoidance Requirements?

The primary requirements are:

- Seabird avoidance gear must be onboard, made available for inspection upon request by specified persons, and must be used while hook-and-line gear is being deployed.
- Use of a line or lines designed to deter seabirds from taking baited hooks (paired streamer line, single streamer line, or buoy bag line).
- Offal discharge methods, including removal of hooks from any offal that is discharged.
- Seabird Avoidance Plan - a new reporting requirement. Must be written, current, and onboard the vessel. Access online at: http://www.fakr.noaa.gov/protectedresources/seabirds/torilines/form.pdf
- Collecting all seabirds that are incidentally taken on the observer-sampled portions of hauls using hook-and-line gear.

What Type of 'Bird Scaring Line' Must be Used?

The type of 'bird scaring line' you are required to use depends on the area you fish, the length of your vessel, the superstructure of your vessel, and the type of hook-and-line gear you use (e.g. snap gear). See Table 20 [follows] and the actual regulations at 50 CFR Part 679.24(e)(2) for your specific requirements.

- Larger vessels [greater than 55 ft (16.8 m) length overall (LOA)] in the EEZ must use paired streamer lines of a specified performance and material standard.
- Smaller vessels [greater than 26 ft (7.9 m) LOA and less than or equal to 55 ft LOA] must use a single streamer line or, in limited instances, a buoy bag line. Required performance and material standards are not specified for smaller vessels.
- In certain situations, an additional device must be used: adding weights to the groundline, use of a second buoy bag line or streamer line, or strategic offal discharge to distract birds away from the setting of baited hooks.
- See Table 20 of Part 679 (following page)
- Go to Reference Chart at end of Seabird Avoidance Plan, website for illustrations of your 'bird scaring line' requirements, based on your vessel type, area fished, vessel length, gear type, and vessel superstructure.

Is 'Night-Setting' an Option as a Seabird Avoidance Measure?

No. Night-setting, the use of a line shooter, or the use of a lining tube (for underwater setting of gear) must be accompanied by the applicable seabird avoidance gear requirements as specified in the regulation.

Are Free Streamer Lines Still Available?

Yes. See the free Streamer Line web page: http://www.fakr.noaa.gov/protectedresources/seabirds/streamers.htm for the nearest Streamer Line distribution center.

What Do I Do if I Accidentally Hook Birds While Hauling Gear and They Come Onboard Alive?

The new regulations continue to require that every reasonable effort be made to ensure that birds brought on board alive are released alive. The U.S. Fish & Wildlife Service (USFWS) says that these live birds should be released on site if they meet ALL of the following criteria:

- Bird can stand and walk using both feet.
- Bird can flap both wings and there is no apparent wing droop.
- Bird is alert, active, holds its head up and reacts to stimuli.
- Bird is not bleeding freely.
- Wing and tail feathers have not been lost and are in good condition.
- Bird is waterproof (water beads up on feathers).

If the bird does not meet all of these criteria, then see Appendix 2 of the USFWS Biological Opinion on the Effects of the Total Allowable Catch-Setting Process for the Gulf of Alaska and Bering Sea/Aleutian Islands Groundfish Fisheries to the Endangered Short-tailed Albatross (*Phoebastria albatrus*) and Threatened Steller's Eider (*Polysticta stelleri*), September 2003, for details on how to care for the bird.

When Are the New Regulations Effective?

The new regulations are effective February 12, 2004, 30 days after the publication of the final regulations in the Federal Register (69 FR 1930, January 13, 2004). See this final rule for the regulations that will become effective on February 12, 2004.

Table 20 to Part 679. Seabird Avoidance Gear Requirements for Vessels, based on Area, Gear, and Vessel Type

(see § 679.24(e) for complete seabird avoidance program requirements; see § 679.24(e)(1) for applicable fisheries)

If you operate a vessel deploying hook-and-line gear, including snap gear, in inside waters ("NMFS Reporting Area 649 (Prince William Sound), 659 (Eastern GOA Regulatory Area, Southeast Inside District) or state waters of Cook Inlet"), and your vessel is...	**Then you must use this seabird avoidance gear in conjunction with requirements at § 679.24(e)...**
>26 ft to 32 ft LOA	minimum of one buoy bag line
>32 ft to 55 ft LOA and does not have masts, poles, or rigging	minimum of one buoy bag line
>32 ft to 55 ft LOA and has masts, poles, or rigging	minimum of a single streamer line
>55 ft LOA	minimum of a single streamer line of a standard specified at § 679.24(e)(5)(ii)

If you operate a vessel deploying hook-and-line gear, other than snap gear, in the EEZ, not including any inside waters listed above, and your vessel is...	**Then you must use this seabird avoidance gear in conjunction with requirements at § 679.24(e)...**
>26 ft to 55 ft LOA and does not have masts, poles, or rigging	minimum of one buoy bag line and one other device[1]
>26 ft to 55 ft LOA and has masts, poles, or rigging	minimum of a single streamer line and one other device[1]
>55 ft LOA	minimum of paired streamer lines of a standard specified at § 679.24(e)(5)(iii)

If you operate a vessel deploying hook-and-line gear, in the EEZ, not including any inside waters listed above, and it is snap gear, and your vessel is...	**Then you must use this seabird avoidance gear in conjunction with requirements at § 679.24(e)...**
>26 ft to 55 ft LOA and does not have masts, poles, or rigging	minimum of one buoy bag line and one other device[1]
>26 ft to 55 ft LOA and has masts, poles, or rigging	minimum of a single streamer line and one other device[1]
>55 ft LOA	minimum of a single streamer line of a standard specified at § 679.24(e)(5)(iv) and one other device[1]

If you operate a vessel deploying hook-and-line gear other than snap gear, in state waters of IPHC Area 4E, and your vessel is...	**Then you must use this seabird avoidance gear in conjunction with requirements at § 679.24(e)...**
>32 ft to 55 ft LOA and does not have masts, poles, or rigging	minimum of one buoy bag line and one other device[1]
>32 ft to 55 ft LOA and has masts, poles, or rigging	minimum of a single streamer line and one other device[1]
>55 ft LOA	minimum of a paired streamer lines of a standard specified at § 679.24(e)(5)(iii)

Table 20 to Part 679
New **February 12, 2004** Page 1 of 2

If you operate a vessel deploying hook-and-line gear in state waters of IPHC Area 4E, and it is snap gear and your vessel is...	Then you must use this seabird avoidance gear in conjunction with requirements at § 679.24(e)...
>32 ft to 55 ft LOA and does not have masts, poles, or rigging	minimum of one buoy bag line and one other device[1]
>32 ft to 55 ft LOA and has masts, poles, or rigging	minimum of a single streamer line and one other device[1]
>55 ft LOA	minimum of a single streamer line of a standard specified at § 679.24(e)(5)(iv) and one other device[1]

[1]other device = w eights added to groundline, another buoy bag line or single streamer line, or strategic offal discharge [see § 679.24(e)(6) for more details]

Table 20 to Part 679
New **February 12, 2004**

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Appendix 7

Japan's National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries

February 2001
Government of Japan

1. Introduction (basic principle and objective)

Japan, as a responsible fishing nation, is fully support the view that fisheries activities have an important role in the supply of food to mankind. Japan duly respects:

1) the awareness of the international society that fisheries are an important industry having the function to ensure social and economic welfare of the people around the world (Kyoto Declaration on Sustainable Contribution of Fisheries to Food Security and its Action Plan);
2) the international agreements that states commit themselves to the conservation and sustainable use of marine living resources (United Nations Conference on Environment and Development (UNCED) and Chapter 17 of Agenda 21); and
3) the Code of Conduct for Responsible Fishing of the United Nations Food and Agriculture Organization (FAO) that calls for promotion of contribution of fisheries to food security.

On the other hand, Japan shares the concerns about the impact of incidental catch of seabirds by various types of longline fishing used by many nations. Japan intends to analyze the impact of Japanese longline fishing on seabirds objectively and scientifically in order to minimize incidental catch of seabirds. As represented by the effort of Japanese fishers to develop streaming devices (Tori-pole/streamer) in order to avoid catch of seabirds in line setting, Japan will continue developing an internationally agreed implementation standard based on voluntary initiatives by fishers for solution of the issue. The Government of Japan, for its part, will continue guidance to Japanese longline fishers regarding specific measures to minimize incidental catch of seabirds. Further, it will promote research and development, as well as guidance, extension and educational activities to cope effectively with the issue. With a view to achieve the above goals, the Government of Japan has established this Action Plan.

2. Present situation of fisheries subjected to the Action Plan

2.1 Types of fisheries

Longline fishing in Japan is classified according to targeted fish species and scale of fishing vessels, etc. This fishery is for the most part managed by the central and regional governments according to the range and scale of operation. The major types of fishery that need to cope with the issue of incidental catch of seabirds in Japan based on their actual situation of operation are: (i) Distant-water longline tuna fishing, (ii) off-shore longline tuna fishing, (iii) Small-type longline tuna fishing. And additionally other small-type longline fishing that operates in the Japanese coastal and offshore areas is also included among fisheries subjected to the Action Plan in order to extensively cope with the issue of incidental catch of seabirds, although the incidental catch is hardly heard from these operations in this area.

2.1 Present situation of fisheries

2.1.1 Distant-water longline tuna fishery

This is longline tuna fishing using fishing vessels of 120 tons or larger. It is controlled by the central government in accordance with the type of vessels. Main operation areas range in the Pacific, Indian Ocean and the Atlantic. (The number of fishing vessels as of August 2000: 529. As the number of fishing vessel was curtailed by 132 compared with about a decade ago)

2.1.2 Off -shore longline tuna fishery

This fishery is operated using fishing vessels of between 20 tons and 120 tons.

Each vessel of this fishery is controlled by the central government. Main operation areas are Japan's off-shore waters and the central and western Pacific.

(The number of fishing vessels as of August 2000: 142. As the number of fishing vessels was curtailed by 220 compared with about a decade ago.)

2.1.3 Small-type longline tuna fishery

This fishery is operated using fishing vessels between 10 tons and 19 tons. Each vessel of this fishery is controlled by the central government. Main operation areas are Japan's near-shore waters and northwestern Pacific. (The number of fishing vessels as of January 1998: 447. The number of fishing vessels was stable for 10 years and more.)

2.1.4 Other longline fishery (which operates in the fishing area along the Japanese coastal/ near-shore)

This is small-type longline fishery, and is mostly regulated by regional governments. Its main operation areas are Japan's coastal and near-shore waters and period of its operation are short ,sometime daily and in short-term season. (The number of fishing vessels (5 tons or more) as of 1998: 2,101. (Nearly 70% are 10 tons or less.))

3. Trend in seabird population associated with to Japanese longline fishing

3.1 South Pacific

In longline tuna fisheries in the southern Pacific, albatrosses and shearwaters are caught incidentally. To date, incidental catch are reported for 9 species of albatrosses (Wandering Albatross, Royal Albatross, Black-browed Albatross, Buller's Albatross, Shy Albatross, Yellow-nosed Albatross, Grey-headed Albatross, Sooty Albatross, Light-mantled Albatross) and 6 species of Shearwaters (Giant Petrel, Hall's Giant Petrel, Pintado Petrel, Brown Petrel, White-chinned Petrel, and Pale-footed Shearwater). These seabird species are distributed widely in the sub-Antarctic areas and have breeding grounds in several tens of locations in South Georgia, Campbell Island, Mcquarie Island, etc. The number of the individuals and stock trend are recorded by del Hoyo et al. (1992) and Robertson and Gale (1998).

3.2 North Pacific

Three species of North Pacific Albatrosses (Black-footed Albatross, Laysan Albatross, and Short-tailed Albatross) are distributed in the North Pacific, and their breeding grounds are found also in the waters surrounding Japan. Breeding grounds of Black-footed Albatrosses and Laysan Albatrosses are mainly found in the Hawaii Islands. Details of breeding grounds and stock trend are recorded by del Hoyo et al. (1992) and Robertson and Gale (1998). The number of individuals of Black-footed Albatrosses is estimated at 260,000-290,000, and that of Laysan Albatrosses at 2.5-3 million. On the sea, Black-footed Albatrosses are distributed on the southeastern side of the North Pacific, and Laysan Albatrosses are distributed on the northwestern side. Further, Short-tailed Albatrosses have breeding grounds in two locations in the waters surrounding Japan, with the total number of individuals standing at about 1,000. It has been reported that juvenile birds are distributed in the sea of the northeastern Pacific.

Incidental catch by longline tuna fishing vessels in the Japanese near-shore areas can occur during the breeding season (autumn-spring) as breeding grounds exist in the waters surrounding Japan. The populations of Albatross in the breeding ground surrounding Japan are: about 7,000 Black-footed Albatrosses, about 100 Laysan Albatrosses, and about 1,000 Short-tailed Albatrosses, reflecting the fact that main distribution area of each species are different from each other. In Tori-Shima of Izu Islands, Short-tailed lbatrosses, which population had once declined to as low as about 50 in the 1950s, smoothly recovered to about 1,000, thanks to environmental improvement projects such as anti-erosion work and tree planting. On the southern small island of the Senkaku Islands as well, population

of Short-tailed Albatrosses showed a gradual increase since they were rediscovered in 1971, with the estimate for 1997 standing at about 100 individuals.

With respect to population of Black-footed Albatrosses on Tori-Shima, an increasing trend has been reported. Further, in December 2000, on the Yomejima Island in the Mukojima archipelago of the Ogasawara Island Group, nest building and breeding spawning activities of Short-tailed Albatrosses have been confirmed.

3.3 Impact on seabird population by causes other than fisheries

As impacts on seabird population by causes other than fisheries, we can enumerate, among other things, deterioration of breeding ground environment, global warming, and marine pollution. In Tori-Shima of Izu Islands, improvement of breeding colony environment, such as anti-erosion work in breeding grounds has steadily proved to be effective for recovery of Short-tailed Albatrosses.

Currently, a plan is underway to induce population to make colonies on safer place with solid bottom. In the Ogasawara Islands, destruction of plants by goats, alien species has caused some problem, and a program is now being promoted to get rid of them. Because of this effort, expansion of breeding colonies for Black-footed Albatrosses and Laysan Albatrosses is expected. On the other hand, erosions of ground in the islands are causing serious threats to breeding colonies. In the breeding ground other than Japan, destruction of the ground by artificial construction or tourism thinning of eggshells and declining hatching rate possibly caused by pollution by organic chloride compounds, swallowing of plastic fragments, contagion, stress caused by noise and lights, disruption of breeding grounds by introduction of harmful animals (Wild Pig in Hawaii, wild boor, cats, mongooses, etc.) and plants, and shortage of feed due to increasing number of individuals are noted as causes for decline in population.

4. Guidance, extension and educational activities

4.1 Steps taken to date

Industries related to longline fishing are engaged in the following activities under the support of the government and scientists:

- Compilation and distribution of booklets

Booklets to illustrate the need to reduce incidental catch of seabirds in order to promote understanding of fishers.

- Making and compilation of water-proof pamphlets

Water-proof pamphlets to enable reading them on the deck so that fishers are always kept informed of the need for reduction of incidental catch of seabirds and can cope effectively with the case of incidental catch during the operation period.

- Seminars for fishers

Organize seminars targeted at fisheries related community, such as fishing vessels crew and ship owners in places where there occur many port entries of longline fishing vessels so that understanding on the need to reduce incidental catch of seabirds may be properly understood and accurately implemented.

4.2 Future steps to be taken

- Compilation and distribution of the Identification Format for possible incidentally caught species.

This format is designed to show the method of identification of seabirds which could be incidentally caught so that fishers can easily identify seabirds' species.

- Production of video films and posters.

Efforts will be made to gain understanding from the fishing community, including not only fishing vessels crew but also fisheries managers, fishing gear technicians with a view to reducing incidental catch of seabirds.

- Provision of information

Provision of information to help fishers to accustom themselves to the use of incidental catch reduction devices and fishing operation using such reduction means.

- Seminars on seabirds release methods

Promote acquisition of techniques to release seabirds with minimum damage when it is alive when taken incidentally.

- Education programs to promote understanding this issue among young people entering fisheries at training institutions such as fisheries high schools.

5. Research and development

In Japan, the following research and development is carried out with a view to reduce incidental catch of seabirds.

5.1 Development of means to avoid incidental catch

The following methods to avoid seabird's incidental catch are being developed:

(i) Improvement of Tori-pole - Efforts have been promoted to improve the effectiveness of Tori-pole now being used and to make it applicable to small-scale fishing vessels as well.

(ii) Seabird scaring device - Research is underway to find out effective means to scare seabirds away from fishing operation areas by the use of stimulant devices such as noise and light.

(iii) Weighted branch line for high-speed sinking - This is designed to shorten the time for seabirds to catch baits by improving the sinking speed of the fishing gear.

(iv) Underwater line setting - The method is designed to shorten the time for seabirds to catch baits by line setting under the water.

(v) Colored bait - Baits are colored so that it may not attract seabirds under the water.

5.2 Assessment and improvement of effectiveness of incidental catch avoidance methods

Effectiveness of Incidental catch avoidance methods is assessed and their improvements are ensured through using experimental fishing activity and real fishing activities.

5.3 Studies on seabird's ecology at sea and the situation of incidental catch.

Information will be collected on distribution and movement and feeding behavior of seabirds in the areas where there is concern over by-catch in order to reduce incidental catch.

6. Improvement of environment of breeding ground and enhancement of reproduction

In order to conserve seabirds, it is indispensable not only regulating fisheries but also improving environment of breeding ground and enhance reproduction. As example it is well known that the improvement of the environment of breeding ground on the Tori-Shima in the Izu Islands have produced visible results in the recovery of Short-tailed Albatrosses. In Japan, such research and studies for enhancing breeding of seabirds and improvement of environment will be promoted positively in the future.

7. Collection of information, research and monitoring

As projects to facilitate the above 5-6, the following steps will be taken:

(i) Collection of data and establishing of databases on incidental catch by government vessels and observers.

(ii) Collection of information on ecology and population of seabirds (Survey on migration and stock distribution of seabirds by sighting programs, Studies on dietary habit of seabirds by means of stable isotopes.)

8. Promotion of international cooperation

8.1 Japan, a traditional fishing nation, has accumulated substantial experience and knowledge concerning fishery stock management, as well as substantial experiences and knowledge regarding by-catch and incidental catch of various marine living resources. It has strived for development and circulation of realistic and effective methods to avoid by-catch of seabirds by longline. Such knowledge and experience has already been utilized by other countries and regional fisheries management organizations. It is committed to continue cooperation in the area of avoidance of incidental catch of seabirds, when necessary, through Government's support to, and dialogue with, developing nations, especially.

8.2 Regarding the current problems pertaining to fishery resource management such as Illegal, Unregulated and Unreported (IUU) fishing activities and the presence of flag-of-convenience (FOC) fishing vessels, it is estimated that no arrangements have been made for reduction of incidental catch because such fisheries are carried out outside the framework of various stock conservation and management measures. Therefore, Japan will strive to assess accurately the impact caused by fisheries outside the international regulatory measures and will continue cooperation through FAO and regional fisheries management organizations so that appropriate arrangements may be implemented.

8.3 As in the foregoing, Japan will strive to reduce incidental catch of seabirds on the basis of this Action Plan, and will cooperate through FAO and regional fisheries management organizations for promoting reduction of incidental catch of seabirds.

9. Measures to reduce incidental catch

The following measures will be implemented in accordance with the following basic policy with a view to minimize incidental catch of seabirds.

(Basic policy)

(i) The experience the fishers have accumulated over a long period of time in implementing the measures to reduce incidental catch should be respected. Fishers should be encouraged to improve and implement those measures voluntarily.

(ii) In so far as practicable, avoidance measures having high selectivity, environmentally safe and with high cost-to-benefit effects should be developed.

(iii) Consideration should be given to alleviating burden of and ensuring safety for fishers.

9.1 Distant-water longline tuna fishery, off-shore longline tuna fishery, and small-type longline tuna fishery

9.1.1 Southern bluefin tuna fish area

Japan has already obliged fishing vessels operating to catch southern bluefin tuna to use bird scaring lines stream (Tori-pole/streamer) in order to avoid catch of seabirds. The following measures will also be taken.

(1) Every effort should be made to release the birds caught alive on the vessels and, if possible, remove hooks so that the birds may not be harmed.

(2) Disposal of offal from the vessels during line setting should be avoided as much

as possible. In unavoidable cases, methods to divert the attention of seabirds from the baited hook should be employed, such as setting the line from the opposite end.

(3) One or more of the following avoidance measures should be applied, taking into account the situation of seabirds gathering and sea conditions.

(i) Night line-setting,

(ii) In baiting, the use of weighted branch line or cone which sink as speedily as possible after line setting

(iii) the use of automatic bait casting machines, and

(iv) the use of properly thawed bait

9.1.2 Pacific area at north of 20 degrees North:

The following measures shall be taken for longline tuna fishing operating north of 20 degrees North in the Pacific area:

(1) Every effort should be made to release the birds caught alive on the vessels and, if possible, remove hooks so that the birds may not be harmed.

(2) Disposal of remains from the vessels during line setting should be avoided as much as possible. In unavoidable cases, methods to divert the attention of seabirds from the baited hook

should be employed, such as setting the line from the opposite end.

(3) One or more of the following avoidance measures should be applied, taking into account the situation of seabirds gathering and sea conditions:

(i) the use of streaming devices (Tori-pole/streamer) to avoid catch of seabirds at the time of line setting, on tagging of impediments such as buoys or wooden boards on the sea surface where the baits are sunk,

(ii) night line-setting,

(iii) Use of weighted branch line or cone that sink as speedily as possible after line setting,

(iv) Use of automatic bait casting machines, and

(v) Use of properly defrozen bait

9.1.3 Specific area (areas within 20 nautical miles from the coast of Tori-Shima)

(October-May)

In coastal the area with 20 nautical miles from Tori-Shima in 7.1.2, two or more of the selective avoidance measures of 7.1.2(3) are implemented in October to May that is the breeding season for albatrosses.

9.1.4 Other longline fishing

Fishers are requested to take the following measures with respect to other longline fishing operating in the Japanese coastal/offshore areas.

(1) Every effort should be made to release the birds caught alive on the vessels and, if possible, remove hooks so that the birds may not be harmed.

(2) Disposal of offal from the vessels during line setting should be avoided as much as possible. In unavoidable cases, methods to divert the attention of seabirds from the baited hook should be employed, such as setting the line from the opposite end.

(3) In case operation takes place from October to May in specific areas (areas at 20 nautical miles from the coast of Tori-Shima), two or more of the following list of avoidance measures are implemented, taking into consideration the situation of seabirds and sea conditions.

(i) the use of bind scaring liens (Tori-pole/streamer) to avoid catch of seabirds at the time of line setting, or tagging of impediments such as buoys or wooden board on the sea surface where the baits are sunk in order to avoid seabirds from taking baits on the hook.

(ii) night line-setting,

(iii) Use of weighted branch line or cone that sink as speedily as possible after line setting

(iv) Use of automatic bait casting machines, and

(v) Use of properly thawed bait

10. Collection of information

Regarding the seabirds that seem to be caught incidentally in all longline fisheries, the central government requests to provide the information when incidental catch occurred.

Appendix 8

Recovery Team Ranking of STAL Recovery Actions

Task rank was determined by the Short-tailed Albatross Recovery Team during their May 2004 meeting in Chiba, Japan.

Task Rank	Task No.	Task Description	No. Votes
1	4.3	Attempt passive attraction of birds to new site using decoys and recorded colony sounds	46
2	1.1	Continue annual monitoring of Tsubame-zaki and Hatsune-zaki on Torishima (active pairs, eggs, fledglings)	44
3	1.4	Conduct decoy & sound system maintenance at artificial colonies	38
4	2.0	Monitor Senkaku population (2 trips per year by politically neutral NGO)	34
5	3.1.1	Conduct Torishima telemetry work; breeders during breeding season	28
6	6.1	Conduct genetic analyses to detect differences between Torishima and Senkaku STAL	26
7	1.5.2	Develop color (or readable stainless) bands for Tsubame-zaki colony	24
7	4.5.2	Translocation of post-guard chicks from Torishima to Yomejima	24
7	5.1 5.2 5.3 5.4	Fisheries Related bycatch reduction: Integrated weight line research. Trawl gear interaction rate study. Trawl gear interaction minimization study. Refine domestic and foreign mitigation measures in fisheries	24
10	4.6	Monitor and maintenance new colony site	22
11	4.4	Conduct surrogate species translocation study (best age for translocation, hand rearing at colony site devoid of adults)	21
12	4.2	Prepare selected new translocation colony site (including arranging access, government permits, local outreach, building construction)	18
12	1.5.1	Develop abrasion-resistant leg band (titanium, Darvic)	18
14	1.5.3	Have Dr. Hasegawa bring along an assistant to Torishima to help with color banding operations	16
14	1.3.1	Torishima erosion control; dig new drainage swale at Tsubame-zaki	16
16	4.1	Conduct feasibility study of other potential colony re-establishment sites	15
16	6.2	Investigate food habits of STAL	15
18	3.1.2	Conduct Torishima telemetry work; fledglings, sub-adults, post-breeders	14
19	3.2	Conduct at-sea capture and telemetry to determine marine distribution during non-breeding season	13
20	4.5.1	Translocation of eggs from Torishima to Yomejima	12
21	9.1	Develop/refine Population Viability Analysis.	11
21	1.3.2	Torishima erosion control; maintain existing gabions above Tsubame-zaki colony	11
23	4.5.3	Translocation of fledglings from Torishima to Yomejima	10
23	6.3.2	Study correlation between BFAL reproductive success and contaminant load (Hg, other metals, POPs) as surrogate for STAL.	10

Task Rank	Task No.	Task Description	No. Votes
23	4.5.4	Translocation of fledglings from Tsubame-zaki to Hatsune-zaki colony on Torishima	10
26	3.3.1	Conduct PTT attachment evaluation (harness types, glue, tape)	9
26	9.3	Develop protocols for field handling	9
26	8.1	Organize seabird bycatch reduction outreach and workshops for other countries fishing in North Pacific	9
26	6.3.1	Conduct contaminants analysis on addled eggs, feathers, and dead chicks	9
26	5.5.1	Develop GIS showing fisheries-albatross range overlap in Japanese fisheries	9
31	3.3.2	Evaluate / deploy archival tags (involves recapture)	8
32	5.5.4	Develop GIS showing albatross range based on sightings from vessels of opportunity	6
33	1.2	Prepare protocols for population monitoring data collection (1st breeding age, % adults breeding, baseline pop info., behavior)	5
33	8.6	Pursue additional support from Japanese government (through bilateral MB treaty or other means)	5
33	5.5.2	Develop GIS showing fisheries-albatross range overlap in Russian fisheries	5