

## SHORT-TAILED ALBATROSS

### *Phoebastria albatrus*

Critical  —  
Endangered  —  
**Vulnerable**  **D1; D2**



*This species qualifies as Vulnerable because it has a very small population and breeding range, limited to two islands. Conservation efforts have resulted in a gradual population increase and an improvement in its threatened status.*

**DISTRIBUTION** The marine range of the Short-tailed Albatross (see Remarks 1) covers most of the northern Pacific Ocean (Hasegawa and DeGange 1982, which see for details of recent pelagic records), where it is usually seen in the colder parts of the ocean, and there are some records in the Sea of Okhotsk but it has not been found in the Sea of Japan in recent years (WBSJ 1993). In the past, it was known to nest on several islands in Japan and off Taiwan, but in recent years it has only bred in Japan, on Tori-shima in the Izu islands and on Minami-kojima in the Senkoku islands, and in 2000 a pair with an egg was found on Yomejima in the Ogasawara islands. Outside the breeding season, it has been recorded along the coasts of eastern Russia, South Korea, mainland China and Taiwan, and in the Hawaiian islands (to USA), and there have been unconfirmed reports from North Korea and Hong Kong. Indeed, unlike the two other species of albatross in the North Pacific, Short-tailed Albatrosses were once abundant in shallow water off coastal North America, where they were even observed around river mouths and regularly captured by North American natives for food (Hasegawa and DeGange 1982).

**Pacific Ocean** This species has been recorded on several of the Hawaiian islands (to USA), mainly on Midway Atoll, where there were (disputed) claims that it bred successfully in the 1960s and a single bird laid an inviable egg in the 1990s. Records are as follows: Midway Atoll (not mapped), north-western Hawaiian islands, first recorded in the late 1930s (Richardson 1994), with the claim (questioned by Tickell 1996) that single birds were successfully fledged in 1961 and 1962 but not reported in order to prevent disturbance to breeding birds (Richardson 1994), and one or two birds annually in the 1970s and 1980s (all except one found in 1981 were banded on Tori-shima), with an 11-year-old bird bearing vestiges of juvenile plumage found incubating an inviable egg in November 1993 (Richardson 1994), and a subadult in February 1996 (Baker and Baker 1997); Sand island (not mapped), Hawaiian islands, a few individuals “in recent years” (Hasegawa 1982); Tern island (not mapped), Hawaiian islands, a few individuals “in recent years” (Hasegawa 1982); French Frigate Shoals (not mapped), Hawaiian islands, a few individuals “in recent years” (Hasegawa 1982).

■ **RUSSIA** The species was regularly recorded in the Pacific waters of Russia (Dement’ev and Gladkov 1951–1954) in the nineteenth century, but records (as follows) have diminished greatly and there appears to be only one since 1940:

■ **Chukotka** 60 km off **Serditse-Kamen’ cape**, two collected and another six seen, September 1939 (Dement’ev and Gladkov 1951–1954); **Bering Strait**, “repeatedly observed”, July (unspecified years) (Nelson 1886 in Dement’ev and Gladkov 1951–1954); **Provideniya bay** (Provideniya bay), August (unspecified year), between this bay and St Lawrence island, July (unspecified year) (Bent 1922 in Dement’ev and Gladkov 1951–1954); **Bering Sea**, one juvenile/subadult, July 1979, first-year juvenile, July 1989 (Ogi *et al.* 1993), at least 15 birds (10 adults and five immature birds), September 1990, the highest count in the Bering Sea in the twentieth century (Camp 1993);

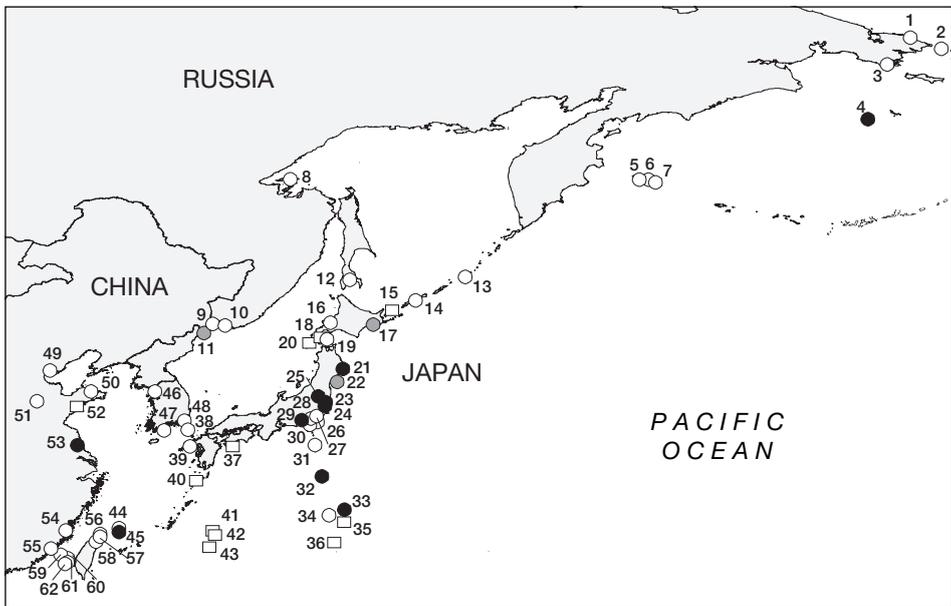
■ **Kamchatka** reported off the coast of Kamchatka, less frequently on the east coast than the west (Dement'ev and Gladkov 1951–1954); **Bering island** (Bering island), Commander islands, 1896 (subadult female in BMNH); **Commander islands**, mid-March (unspecified years) (Stejneger 1885 in Dement'ev and Gladkov 1951–1954); between **Mednyy island** and Attu island, June (unspecified years) (Clark 1910 in Dement'ev and Gladkov 1951–1954);

■ **Khabarovsk Bol'shoi Shantar island** (Shantar island), October 1934 (Dulkeit and Shulpin 1937 in Dement'ev and Gladkov 1951–1954);

■ **Primorye Sedimi** (Sidemi) inlet, male collected, May 1883 (Taczanowski 1891–1893); **Abrek bay**, adult female and juvenile male collected, July 1875 (Taczanowski 1891–1893); **Tumen river mouth** (Tumangan river), near Khasan, Peter the Great bay, one 200 m offshore, November 1978 (Nazarov and Kurinnyi 1981);

■ **Sakhalin Sakhalin island**, "common" in summer and autumn, mid-nineteenth century (Mitsul' 1873, Bianki 1913); **Aniva bay**, southern Sakhalin, end of nineteenth century (Nikol'skiy 1889), and off the coast of southern Sakhalin, mid-April (unspecified years) (Suprunenko 1890 in Dement'ev and Gladkov 1951–1954);

■ **Kuril islands Simushir island** (Middle Kuril island), one collected, August 1896 (Kiyosu 1965); **Iturup island**, before 1887 (two adults and two immatures in BMNH); southern Kuril islands, between Iturup island, Shirotan island and **Kunashir island**, undated (Gizenko 1955, Kiyosu 1965, Nechaev 1969).



**The distribution of Short-tailed Albatross *Phoebastria albatrus*:** (1) Serdtse-Kamen' cape; (2) Bering Strait; (3) Provideniya bay; (4) Bering Sea; (5) Beringa island; (6) Commander islands; (7) Mednyy island; (8) Bol'shoi Shantar island; (9) Sedimi; (10) Abrek bay; (11) Tumen river mouth; (12) Aniva bay; (13) Simushir island; (14) Iturup island; (15) Kunashir island; (16) Otaru-shi; (17) Kushiro; (18) Hiyama; (19) Hakodate; (20) Oshima; (21) Sanriku; (22) Kinkasan island; (23) Hitachi; (24) Oarai; (25) Kuroiso-shi; (26) Chikura-machi; (27) Tokyo bay; (28) Sagami bay; (29) Fuji-gawa river mouth; (30) O-shima; (31) Hachijo-jima; (32) Tori-shima; (33) Mukojima; (34) Nishino-shima; (35) Imoto-jima; (36) Iwo-jima; (37) Ashizuri cape; (38) Tsushima; (39) Nagasaki; (40) Kagoshima; (41) Kita-daito-jima; (42) Minami-daito-jima; (43) Okino-daito-jima; (44) Kobi-sho; (45) Minami-kojima; (46) Inchon; (47) Pusan; (48) Komun-do; (49) Hebei; (50) Yantai; (51) Jinan; (52) Qingdao; (53) Jiangsu; (54) Fuzhou; (55) Xiamen; (56) Pengchia Yu; (57) Mienhua Yu; (58) Chilung; (59) Taiwan Strait; (60) Paisha island; (61) Penghu islands; (62) Mao Yu.

○ Historical (pre-1950) ● Fairly recent (1950–1979) ● Recent (1980–present) □ Undated

■ **JAPAN** The species formerly bred in the Izu islands, Ogasawara islands, Daito islands and Senkaku islands, but since its population crash around the start of the twentieth century it has only been recorded nesting on Tori-shima in the Izu islands and Minami-kojima in the Senkaku islands, and in 2000 a pair with an egg was found on Yome-jima in the Ogasawara islands. It ranges widely at sea off Japan, and there have been records off most of the main Japanese islands, with records (by island and prefecture) as follows:

*At sea* Tokyo–Kushiro ferry (not mapped), regularly seen, e.g. subadult, May 1986, adult, February 1989 (Brazil 1991); Tokyo–Ogasawara islands ferry (not mapped), up to 30 birds regularly seen close to the breeding colony on Tori-shima island, February–April (unspecified years) (Brazil 1991); Tokyo–Kyushu ferry (not mapped), immature seen off Shikoku, February 1982 (Brazil 1991);

*Hokkaido* **Otaru-shi**, one collected, April 1883 (Yamashina 1930b; also Austin and Kuroda 1953); 12 nautical miles south-west of **Kushiro**, two, August 1952 (Kiyosu 1965); **Hiyama**, undated (Wildlife Information Center, Hokkaido 1985); **Hakodate**, five, 1874–1877, immature, June 1880, one adult and two immature males, April–July 1883, adult female, April 1884 (Austin and Kuroda 1953, three specimens in BMNH and MCML; also Kiyosu 1965); **Oshima**, undated (Wildlife Information Center, Hokkaido 1985); Shibashiri (untraced), adult male collected, March 1907 (Austin and Kuroda 1953);

*Honshu* ■ **Iwate** off **Sanriku**, juvenile seen offshore, June 1997 (*Birder* 97/9); ■ **Miyagi** off **Kinkasan island**, juvenile seen off Tokyo–Kushiro ferry, December 1962 (Kuroda 1963 in Brazil 1991); ■ **Ibaraki Hitachi**, adult seen offshore, April 1996 (*Birder* 96/7); off **Oarai**, adult seen offshore, June 1995 (*Birder* 95/9); ■ **Tochigi Kuroiso-shi**, one, March 1983 (Tochigi Prefecture 1984); ■ **Chiba Chikura-machi**, Awa-gun, adult females collected, March 1882 and February 1884 (Kiyosu 1965; also Austin and Kuroda 1953); ■ **Tokyo Tokyo bay**, immature collected, March 1883 (Kiyosu 1965; also Austin and Kuroda 1953); ■ **Kanagawa Sagami bay**, one collected, before 1913 (Austin and Kuroda 1953; also Kiyosu 1965); ■ **Shizuoka Fuji-gawa river mouth**, March 1996 (i.e. WBSJ Minamifuji Chapter database);

*O-shima* island, Izu islands, before 1891 (Yamashina 1942, Kiyosu 1965);

*Hachijo-jima* island, Izu islands, before 1939 (Yamashina 1942), March 1950 (Kiyosu 1965);

*Tori-shima* island, Izu islands, nineteenth and twentieth centuries (Hattori 1889 in Hasegawa and DeGange 1982, Austin and Kuroda 1952), currently the main breeding site of this species (chiefly at Tsubame-zaki: Hasegawa 1978, 1980, 1982, H. Hasegawa *in litt.* 2000, Sato *et al.* 1998);

*Muko-jima* islands, Ogasawara islands, on Kitono-jima island, January 1900 (Kiyosu 1965), the Muko-jima islands having formerly been a breeding site (Hasegawa and DeGange 1982), pair with one egg on Yome-jima island, December 2000 (*Asahi Shimbun* and *Yomiuri Shimbun* newspapers, 28 December 2000);

*Nishino-shima* island, Ogasawara islands, breeding, December 1924 (Kiyosu 1965; also Hasegawa and DeGange 1982);

*Imoto-jima* island, Haha-jima islands, Ogasawara islands, undated (Kiyosu 1965);

*Iwo-jima* (Volcano islands), undated (Kiyosu 1965);

*Shikoku* ■ **Kochi Ashizuri Cape**, before 1975 (Ishihara 1982);

*Kyushu* ■ **Nagasaki Tsushima** island, immature male collected, June 1885 (Austin and Kuroda 1953, Kiyosu 1965); **Nagasaki**, two collected, including an immature male, June 1877 (Austin and Kuroda 1953, Kiyosu 1965); ■ **Kagoshima** unspecified locality, undated (Kiyosu 1965);

*Kita-daito-jima* island, Daito islands, a former breeding site (Hasegawa and DeGange 1982);

*Minami-daito-jima* island, Daito islands, a former breeding site (Hasegawa and DeGange 1982);

*Okino-daito-jima* island, Daito islands, a former breeding site (Hasegawa and DeGange 1982);

*Kobi-sho* island, Senkaku islands, one egg collected, before 1928 (Kobayashi 1930), the Senkaku islands having formerly been a breeding ground (Hasegawa and DeGange 1982; see Miyashima 1900–1901);

*Minami-kojima* island, Senkaku islands, 12 birds, 1971 (Ikehara and Shimosawa 1971), 35 birds, 1980 (Hasegawa and DeGange 1982), 50 bird, 1988 (McWhirter *et al.* 1996), seven chicks counted during an aerial survey, April 1988 (Anon. 1988a), 11 chicks, April 1992, with an estimated that the current population there may now be c.100–150 birds (H. Hasegawa *in litt.* 2000).

■ **KOREA** ■ **NORTH KOREA** There is one doubtful and undated report (Tomek 1999) by a lighthouse keeper of “very many” albatrosses (probably including this species) on Sindo island (Sin island) near Yongampo in North Pyongan, possibly implying that they were breeding there (Kuroda 1923 in Austin 1948).

■ **SOUTH KOREA** It probably occurred regularly off South Korea in the past, but there are no recent reports (Gore and Won 1971). Records (by province) are as follows: ■ **Kyonggi and Seoul Incheon** (Chemulpo), before 1891 (Gore and Won 1971); ■ **South Kyongsang** off **Pusan** (Fusan), June 1885 (Austin 1948); ■ **South Cholla Komun-do** island (Komon-do, Port Hamilton), one collected, undated (probably before 1891) (Gore and Won 1971).

A lighthouse keeper reported that albatrosses (probably including this species) were occasionally seen at Chilbal island (Chilpyal) in South Cholla (Kuroda 1923 in Austin 1948).

■ **CHINA** ■ **MAINLAND CHINA** The species presumably used to occur regularly off the east coast of China before its population crash around the turn of the twentieth century, and it was described as “very common” on the China coast by La Touche (1925–1934), but there were few confirmed records. Several reports are here treated as unconfirmed, because insufficient evidence was published to eliminate other albatross species. Records (by province) are as follows:

■ **Liaoning** near Niuzhuang (Niutschwang), “brown albatross” seen, probably this species, July 1889 (Meise 1934);

■ **Hebei** unspecified locality, reported to have been seen by Möllendorf, undated (Wilder and Hubbard 1924);

■ **Shandong Yantai** (Chefoo), 1873 (immature in BMNH); Yellow River north of **Jinan** (Tsinan), where a specimen in Qilu (Cheloo) University was reported to have been collected at this (inland) locality, undated (Wilder 1940a); **Qingdao** city coastal wetlands, “rare”, undated (Liu Daiji *et al.* 1994);

■ **Jiangsu** unspecified localities, recorded during a survey in 1982–1990 (Li Guozhong *et al.* 1991).

■ **Fujian Fuzhou** (Foochow), several collected along the coast, spring 1887 (La Touche 1892), adult, February 1881, immature, May 1896 (two specimens in BMNH); **Xiamen** (Amoy), April 1866 (male and female in BMNH).

Unconfirmed reports are as follows: at sea off the coast between Shantou (Swatow) and Xiamen (Amoy), Guangdong and Fujian provinces, where “a great many albatrosses, both dark brown and white” (possibly this species) were seen in March 1889 (La Touche 1892), and described as a “huge flock” (J. D. La Touche in Mell 1922); four specimens of this species labelled “Hong Kong” (but presumably collected elsewhere) were examined in the City Hall Museum in Hong Kong (not the current city hall, suggesting that the specimens were lost during the Second World War), which were originally labelled as Wandering Albatross *Diomedea exulans* (Kuroda 1929).

■ **TAIWAN** The species formerly bred on small islands off the northern and western coasts of Taiwan, with records as follows: **Pengchia Yu** island (Pengjia Yu, or Agincourt

island), egg collected and birds caught by fishermen, late nineteenth century (Mackay 1896), April 1901 (Enomoto 1936), three collected, November 1905 (Oshima and Kuroda 1916), undated (Shibuya 1915), probably extinct before 1935 (Liu Ke-shuang 1995; see Threats); **Mienhua Yu** island (Craig island), probably bred here (see Remarks 2), where there was a very large seabird colony in the late nineteenth century (Mienhua means cotton, and this island was named “Cotton island” because of the white layer of guano) (Mackay 1896, Enomoto 1936; see Threats); **Chilung** (Keelung), juvenile collected, March 1909 (Dien Zuh-ming 1955); **Taiwan Strait**, “common”, mid-nineteenth century (Swinhoe 1863a); **Paisha island** (Baisha, Byosho), Penghu islands, March 1897 (male in YIO), a former breeding site (Hasegawa and DeGange 1982); off the **Penghu islands**, February or April 1897 (Tada 1899, female in YIO); **Mao Yu** island (Cat island), westernmost of the Penghu islands, breeding, late February 1902 (Enomoto 1936).

**POPULATION** The Short-tailed Albatross was an abundant species until the late nineteenth century, but its population then crashed to near extinction, mainly because of over-exploitation at the breeding colonies (see Threats). It was described as a common species in Japanese waters by Seebohm (1890). In the 1880s, there were 3–4 nesting grounds on Tori-shima island, but collection of birds for their feathers began in 1892 (WBSJ 1975). It must have had a very large population before this exploitation began, as Hattori (1889, in Yamashina 1942) estimated that c.100,000 birds were killed in a single season on Tori-shima, and during a 17-year period more than five million birds were supposedly taken from their nesting islands (Hasegawa and DeGange 1982). This species was officially protected in 1907 and a non-hunting area was established on Tori-shima in 1929, but the poaching still continued (Kiyosu 1965). In February 1929, c.2,000 birds were estimated on Tori-shima, but they had declined to a few hundred in April 1932, and only a few dozen birds could be found during a visit to the island in April 1933 (Yamashina 1942). Despite their reduced numbers, the killing did not cease and a local man reported that c.3,000 birds were taken between December 1932 and April 1933, probably because the islanders knew that a non-hunting law would be enforced in August 1933 (Yamashina 1942). The albatross was thought to be extinct in the late 1940s, but was rediscovered on Tori-shima in January 1951, and by January 1955 there were 23 adults and three young birds there (WBSJ 1975).

Following careful protection of the nesting colony on Tori-shima (see Measures Taken), its numbers have slowly recovered. During the 1950s its population there ranged from 20–30 birds, for example there were 14–15 adults, 5–7 immatures and eight chicks in April 1958 (Aranoff 1960 in Brazil 1991). Its population rose to over 50 in the 1960s and over 60 in the 1970s (Environment Agency 1976 and OSJ 1974 in Brazil 1991). In 1977/1978, 73 adults and 12–20 chicks were seen on Tori-shima, and in 1978/1979 there were 95 adults and 22 chicks were reared (Hasegawa 1980). In 1979/1980, more than 50 eggs were laid on Tori-shima and 20 young fledged, and in 1980/1981 54 eggs were laid and 32 fledged and c.130 adults and subadults were seen (Hasegawa 1982). In 1992, it was estimated there were 180 breeding pairs on Tori-shima (Hasegawa 1992). In 1971, a small population of 12 birds were found on the island of Minami-kojima in the Senkaku islands (Ikehara and Shimozawa 1971, Hasegawa 1984), which had increased to 35 birds by 1980 (Hasegawa and DeGange 1982), and seven chicks were counted there during an aerial survey in April 1988 (Anon. 1988a). Eleven chicks were seen there on the most recent visit to this island in April 1992, and if the population on this island has increased at a similar rate to that on Tori-shima, there would now be roughly 100–150 birds there (H. Hasegawa *in litt.* 2000). The total world population was estimated at 400 birds in 1988 (Hasegawa in Amaral 1988), at c.600 birds in 1992 (WBSJ 1993) and at 700–750 birds in 1994 (Richardson 1994). By 1999, it was considered that its numbers exceeded 1,000 birds, including 550 adults, 400 immatures and 139 chicks hatched from 213 eggs (H. Hasegawa in *Yomiuri Shimbun* newspaper 1999), and this assessment has been refined to

an estimate of c.1,200 individuals, on the basis that there were 213 breeding pairs and 143 fledged young (from 213 eggs laid) on Tori-shima in 1998/1999, plus 540 potential breeders (non-breeding birds in the process of re-pairing and birds below the first breeding age of six years) based at that colony, plus the 100–150 estimated for Minami-kojima (H. Hasegawa *in litt.* 2000).

**ECOLOGY Habitat** The Short-tailed Albatross is pelagic for much of the year, but returns to colonies on small, remote offshore islands, where in the past it seemed to prefer level, open areas adjacent to tall clumps of the grass *Miscanthus sinensis* for nesting (Hasegawa and DeGange 1982). At Tsubame-zaki, the main nesting colony on Tori-shima, the nesting ground is now is mostly bare or sparsely vegetated, as the vegetation has probably been trampled and eliminated by the bird's activities, which has made the volcanic soil unstable, this perhaps being the cause of the relatively low reproductive success of this species there in the mid- to late 1970s (Hasegawa 1982, Hasegawa and DeGange 1982). It appears to require bare ground surrounded by cliffs at its nesting grounds, with runways to allow it to take off (Kiyosu 1965, Research Center, WBSJ 1993).

**Food** This species is a surface feeder, and is thought to feed mostly nocturnally because of its fondness for squid (Hasegawa and DeGange 1982). It also eats fish and crustaceans (del Hoyo *et al.* 1992). It was/is known to follow ships and feed on galley scraps and fish offal, and, when it was still abundant, it was observed to feed on wastes from the whaling fleets near to the Pribilof islands in the Bering Sea (Hasegawa and DeGange 1982).

**Breeding** It is a colonial nesting species, and birds arrive at the breeding grounds in mid-October (Research Center, WBSJ 1993). One egg is laid per nest between late October and December, and the chicks hatch between early January and February and fledge between April and June (Kiyosu 1965). Young birds are sexually mature at four years (Research Center, WBSJ 1993), but they do not start to nest until their sixth year (H. Hasegawa *in litt.* 2000). Before they start breeding they return to the colony for several years to gain experience in breeding activities and to establish a pair-bond, which often lasts for life (Hasegawa and DeGange 1982).

**Migration** The seasonal movements of the Short-tailed Albatross are poorly known. They begin arriving at Tori-shima in early October, increasing in numbers until breeding begins in late October; failed breeders and non-breeders leave the island in winter and spring, and successful breeders and fledglings depart from late May to June (Hasegawa and DeGange 1982; also Kiyosu 1965). After leaving the breeding grounds, birds move northwards along the Japanese coast to summer in the Bering Sea, and then down the west coast of North America from the Gulf of Alaska as far south as Baja California before returning to the breeding grounds in late autumn (Austin and Kuroda 1953, del Hoyo *et al.* 1992). Outside the breeding season, in June to October, they probably scatter widely in the north Pacific but may concentrate in nutrient-rich waters (Hasegawa and DeGange 1982).

**THREATS Direct exploitation** This species declined dramatically on Tori-shima island, and presumably at its other breeding colonies, because of unsustainable exploitation in the late nineteenth and early twentieth century (Austin 1948, Tickell 1975, Harrison 1979 and Hasegawa 1979 in Hasegawa and DeGange 1982; also Austin and Kuroda 1953, Brazil 1991). The large-scale killing of albatrosses began on Tori-shima around the time that people settled on the island in 1887, primarily for feathers to make quilts, but the carcasses were also rendered into oil and fertiliser (Hasegawa and DeGange 1982). The slaughter continued well into the 1930s, despite a law passed by the Japanese government to ban its exploitation in 1933, and a volcanic eruption on Tori-shima in 1939, which buried much of the former nesting grounds, appears to have forced the few surviving albatrosses to abandon the island; only one bird was seen there in the 1940s, and the species was assumed to be extinct until its

rediscovery in the 1950s (Hasegawa and DeGange 1982). Several current potential threats to the nesting colony on Tori-shima are outlined below.

**Mortality caused by fisheries** At least five Short-tailed Albatrosses are known to have been killed by fishing-nets, three near Tori-shima island (two in 1985 and one in 1995), one in the Bering Sea in 1983 and one in the Gulf of Alaska in 1987 (Oka *et al.* 1997). A juvenile male bird found in Shizuoka prefecture in Japan on March 1996 had been injured by a fish-hook, and it died a few days later (Oka *et al.* 1997). A bird seen on Tori-shima in November 1987 had a fish-hook lodged in its beak (Anon. 1988a). It is also conceivable that heavy exploitation of fish and squid stocks may hamper the feeding efficiency of breeding birds, and may thus suppress breeding success in some cases.

**Loss of breeding grounds** Soil erosion at the breeding site on Tori-shima, probably caused by trampling by the albatrosses themselves, has been a major threat (although this problem has been addressed: see Measures Taken), and there is a constant danger that the nesting grounds could be destroyed by volcanic eruptions (Hasegawa 1984, Research Center, WBSJ 1993). The construction in 1909 of a lighthouse on Pengchia-yu island, off Taiwan, appears to have coincided with the collapse of the breeding colony there (Liu Ke-shuang 1995, Lin Wen-horn *in litt.* 1998), but whether this was due to direct human exploitation, disturbance or other factors is not clear. On nearby Mienhua-yu island the species almost certainly bred but died out with other nesting seabirds with the advent of guano extraction, 1910–1920 (Lin Wen-horn *in litt.* 1998).

**Competition for nest sites** Black-footed Albatrosses *Phoebastria nigripes* also nest on Tori-shima, and during the 1970s/1980s they were increasing faster than the Short-tailed Albatrosses, so that it was feared that, as they arrive to nest earlier than Short-tailed Albatross, they might take over the breeding site at Tsubame-zaki (Hasegawa 1982, Hasegawa and DeGange 1982). However, the breeding habitat preferences of these two species differ, as Black-footed Albatrosses prefer sandy areas (Fuchimoto 1963), so competition for nest sites has proved not to be a significant threat.

**Potential predators** The introduced black rat *Rattus rattus* is widespread on Tori-shima, including on the nesting slope used by the albatrosses, and it was feared that they might prey on eggs or hatched young, although there was no direct evidence (Hasegawa 1982, 1984). However, there is now evidence that predation by rats is not as serious a problem as was feared (Y. Tsukamoto verbally 1999).

**Pollution** Fishing-lines, pieces of polystyrene, plastics and plastic bags are reported to appear in the food delivered to nestlings, and have been regurgitated by the young birds, and this type of pollution could be a significant cause of mortality in this surface-feeding species (Amaral 1988, *Birder* editorial 2000). An incubating bird has been seen with oil on its breast (Anon. 1988a), and mortality caused by oil spillages at sea is another potential cause of mortality. The possibility of oil exploration around the Senkaku islands has been discussed in the past, and although no such activity is planned for Tori-shima, there is some oil pollution in this area, as tar balls have been found on the beaches (Hasegawa and DeGange 1982).

**MEASURES TAKEN Legislation** The species was officially protected in Japan in 1907, and it was designated as a Natural Monument in 1958, a Special Natural Monument in 1962 and a Special Bird (Environment Agency of Japan 1976, Kato *et al.* 1995). It has been protected as a National Endangered Species since 1993, and it is on the Red List of Japan, which means that its conservation importance is recognised and it can be used as a reference species in environmental impact assessment for development projects (Environment Agency of Japan *in litt.* 1999). It has been listed as a protected species by the United States government, and the US Department of the Interior (Fish and Wildlife Service) lists the Short-tailed Albatross as an Endangered Species (Federal Register No. 8495 June 2 1970) (DeGange 1981). There has also been a more recent proposal to list this species as Endangered in the USA (*US*

*Federal Register* 2 November 1998, 63 no. 211: 58962–58700). It is listed on Appendix I of the CMS (Bonn Convention, for which see Boere 1991).

**Protected areas** A non-hunting area was established on Tori-shima in 1929, but by the time it was enforced in 1933 it was apparently too late to save the species (Environment Agency of Japan 1976, Kato *et al.* 1995). Tori-shima (4.53 km<sup>2</sup>) is now established as a National Wildlife Protection Area, mainly for the conservation of the Short-tailed Albatross (Environment Agency of Japan *in litt.* 1999).

**Habitat management** In 1981–1982, native vegetation was transplanted into the nesting colony on Tori-shima (while the birds were absent from the colony), in order to stabilise the substrate and even the nest structures themselves (Hasegawa 1984); this action enhanced breeding success, with over 60% of eggs now resulting in fledging young (Brazil 1991; see Population).

**Establishment of a new nesting colony** Because the single nesting site on Tori-shima was vulnerable to destruction by volcanic eruptions and prone to erosion, sound lures and decoys have been used to attract birds to nest at other locations on the island, notably Hatsunozaki, a particularly favourable site with a gentler slope than at the main colony, and the first pair started breeding at this new site in November 1995 (Research Center, WBSJ 1993, Sato *et al.* 1998, *Oriental Bird Club Bull.* 31 [2000]: 20–21).

**Research** The nesting birds on Tori-shima have been intensively studied since their rediscovery in the 1950s (e.g. Hasegawa 1978, 1980, 1982, 1991), and in the 1980s aerial surveys were conducted at the colony in the Senkaku islands and this species was looked for (unsuccessfully) on other islands in this group (Hasegawa 1984).

**MEASURES PROPOSED** **Habitat management** The measures taken on Tori-shima to manage the existing colony and to establish a new colony have already achieved notable successes and should be continued. If feasible, comparable measures should be taken in the Senkaku islands (although this is difficult because they are the subject of territorial claims involving Japan, mainland China and Taiwan), and at any newly discovered nesting colonies.

**Management of fisheries** Measures are required to protect this species from entanglement in fishing-nets, especially around the breeding islands and in its main foraging waters in the western North Pacific between autumn and spring (Oka *et al.* 1997).

**Research** The status of the population on Tori-shima is well understood because of the long-term research and monitoring that has been conducted, and this work should be continued. If possible, research should be conducted on the status and conservation needs of this species at the breeding colony in the Senkaku islands. As the population of this species recovers, it is likely that new colonies will be established, and efforts should be made to locate and protect them. There is a strong possibility that it will re-establish colonies on the islands where it nested in the past, where conditions must be potentially suitable for it, and searches for it should be conducted in the appropriate season at some of these sites.

**REMARKS** (1) The scientific name *Phoebastria albatrus* is used for this species, rather than the widely used name of *Diomedea albatrus*, following the revision of albatross taxonomy by Robertson and Nunn (1998). (2) It is unclear whether this species ever bred on Mienhua-yu island (Craig island) off Taiwan, but the island is mapped here on the assumption that it was recorded there in the past.