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Assessment Report
On
The Implementation of "Japan's National Plan of Action For Reducing Incidental Catch of Seabirds In Longline Fisheries"

(Preliminary version)

(Document for submission to the 25th FAO Committee on Fisheries)

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Fisheries Agency, Government of Japan

Introduction

The FAO International Plan of Action for Reducing Incidental Catch of seabirds in Longline Fisheries (IPOA-SEABIRDS) was adopted at the 23rd FAO Committee on Fisheries in February 1999. Following this decision, Japan developed its National Plan of Action (NPOA-SEABIRDS) through discussion and consultation at a national consultative committee as well as discussion within the government. The Japan's NPOA-SEABIRDS was reported to the 24th FAO Committee on Fisheries in March 2001.

Under NPOA-SEABIRDS, Japan strived to reduce the incidental take of seabirds by longline fisheries. Successful results were achieved. This document reports on the assessment and implementation of the NPOA-SEABIRDS to the 25th FAO Committee on Fisheries in February 2003 in accordance with paragraph 21 of the IPOA-SEABIRDS.

1. The present situation of the targeted fisheries

(1) Types of targeted fisheries

Longline fisheries in Japan are classified by such categories as targeted fish species and scale of fishing vessels. Except for very small-scale vessels, longline fisheries are managed by the national or prefectural governments depending on the scope and scale of operation. Among them, those covered under the NPOA-SEABIRDS include distant-water tuna longline fisheries, near-shore tuna longline fisheries, coastal tuna longline fisheries placed under the management of the national government, and other small-type longline fisheries which operate in the Japanese coastal waters and placed under the management of prefectural governments.

(2) Present state of fisheries

(i) Distant-water tuna longline fisheries
This is pelagic longline fisheries using fishing vessels of 120 tons or over and is managed on a vessel-to-vessel basis by the national government. Major operation areas extend to the Pacific, the Indian Ocean and the Atlantic. As a result of vessel scrapping in 1999 in accordance with FAO IPOA-Capacity, the number of fishing vessels in 2002 (as of August) was 525, a decrease of 197 (27%) from a decade ago. Therefore, it is considered that incidental take of seabirds is also declining to the same extent. Main targeted species are tunas and swordfish.

(ii) Near-shore tuna longline fisheries
This is pelagic longline fisheries (except coastal tuna longline fisheries in (iii)) using fishing vessels from 10 tons and less than 120 tons, and is managed on a vessel-to-vessel basis by the national government. The operation waters are Japan's near-shore and the central and western Pacific. The number of fishing vessels has been declining, with 427 in 2002 (as of August), which was a decrease of 169 (28%) from a decade ago. Therefore, it is considered that incidental take of seabirds has also been reduced to the same extent. Main targeted species are tunas, swordfish and sharks.

(iii) Coastal tuna longline fisheries
This is pelagic longline fisheries mostly operated in Japan's exclusive economic zone, using fishing vessels from 10 tons and less than 20 tons, and is managed on a vessel-to-vessel basis by the national government. The number of fishing vessels has been decreasing in the past several years, with 399 (of which 298 also engaging in near-shore tuna longline fisheries in (ii)) as compared with 478 a decade ago.

Main targeted species are tunas, swordfish and sharks.

(iv) Other longline fisheries
These are small-type longline fisheries mostly under management of the prefectural governments. Their operations take place in Japan's coastal and offshore areas based on one-day trips and in limited seasons. The number of fishing vessels (5 tons or larger) in the year 2000 was 2,076, a decrease of 960 (32%) from a decade ago. Main targeted species are cods and blowfish.

(v) Summary
The number of longline fishing vessels subject to this NPOA-SEABIRDS has been significantly reduced over the past decade mainly to reduce the number of licenses and to scrap the fishing vessels thus substantially contributing to a reduction of the incidental take of seabirds. However, despite such efforts in Japan, the catch efforts of longline fisheries, particularly tuna longline fisheries, in the world have been increasing according to data of the FAO. Concerted actions to reduce the incidental take of seabirds by other longline fishing nations are therefore much desired.

(3) Management of fisheries

In order to conduct tuna longline fisheries managed by the national government, it is necessary to obtain license for operation from the Minister of Agriculture, Forestry and Fisheries (distant-water tuna longline fisheries, near-shore tuna longline fisheries) or confirmation of notification for operation (coastal tuna longline fisheries) in accordance with domestic laws, government decrees and ministry ordinances. In license-based fisheries, the Minister determines the overall number of licensed fishing vessels and conditions of operation taking the state of the resources into consideration. The decision is reviewed once every five years. In recent years, the number of licensed vessels has been decreasing. In the fisheries based on notification, submission of an annual operation plan is required at the time of notification for operation to the Minister. Furthermore, in these tuna longline fisheries managed by the national government, submission of catch reports and logbook reports for non-targeted species caught secondarily or incidentally for each trip is required in order to collect data concerning catch and incidental take of non-targeted species, including seabirds.

The year 2002 was the year for review of licensed fisheries held once in five years. In 2002, conventional review on the overall number of fishing vessels was carried out. At the same time, the range of near-shore tuna longline fisheries, which is controlled by the national government, was expanded from vessels ranging from 20 to less than 120 tons to vessels from 10 to less than 120 tons.

Other small-type longline fisheries are managed mainly under the license system of prefectures. The national government requests the provision of information on incidental take of seabirds from those fisheries.

2. Occurrence of incidental take of seabirds and introduction of mitigation measures to avoid incidental take of seabirds

In order to grasp the situation of implementation of the NPOA-SEABIRDS, surveys were conducted on the experience of incidental take of seabirds since March 2001 when the NPOA-SEABIRDS was introduced, as well as the situation of introduction of mitigation measures to avoid incidental take of seabirds.

(1) Distant-water tuna longline fisheries, near-shore tuna longline fisheries, and coastal tuna longline fisheries

(i) Southern bluefin tuna fishing ground waters
Distant-water tuna longline fishing vessels are operating in the southern bluefin tuna fishing ground. The rate of fishing vessels having experience of the incidental take since March 2001 was at a high level of 95%. But, with respect to the implementation of the mitigation measures, the rate of implementation of conventionally required Tori-pole was 100%, and all the vessels are using bait-casting machines and fully thawed baits concurrently. Thus, full implementation of the NPOA-SEABIRDS has been achieved.

However, to achieve the further reduction of the incidental take of seabirds, promotion of research and studies regarding new mitigation measures is necessary.

(ii) Areas in the Pacific north of 20 degrees north
Near-shore tuna longline fishing vessels are mostly operating in the waters in the central and western Pacific north of 20 degrees north. Fishing vessels having experience of the incidental take since March 2001 was 78%. The rate of implementation of the mitigation measures in accordance with the NPOA-SEABIRDS was 77%. Major mitigation measures were weighted branch lines and Tori-pole.

These high rates of implementation of the mitigation measures must be substantially contributing to the reduction of incidental take of seabirds in this area, but future surveys are needed to quantify this.

(iii) Specific waters (the waters 20 nautical miles from the shore of Torishima Island)
In the waters in the above (ii), coastal tuna longline fishing vessels are operating in the waters 20 miles from the shore of Torishima Island on which breeding colonies of Short-tailed albatrosses (*Diomedea albatrus*) exist. The rate of fishing vessels that implemented the mitigation measures in accordance with the NPOA-SEABIRDS since March 2001 was 75%.

Furthermore, in this specific area, for conservation of the Short-tailed albatross, implementation of two or more methods of mitigation is required from May to October, which is the breeding period. However, only a small number of fishing vessels fulfilled this requirement.

(2) Other longline fisheries

With respect to small-type longline fisheries operating day-trip fishing or seasonally limited fishing in the coastal and offshore waters, the survey was conducted through the prefectural governments to fisheries cooperative associations. The fishing vessels having experience of the incidental take since March 2001 were at a very low rate of 15%. Among fishing vessels having experience of the incidental take, many took the mitigation measures such as thawing of baits, weighted branch lines and, night line setting.

More than 50% responded that the number of seabirds flying to their vessels were the same as in the past.

(3) Summary

(i) Incidental take of seabirds occurs with the highest frequency in the southern bluefin tuna waters (Indian Ocean middle high latitude waters). In addition to Tori-pole required as international measures by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), it is required to use other mitigation measures under the NPOA-SEABIRDS, and full implementation of those measures have been achieved. Because of these efforts, incidental take of seabirds, which were said to total 30,000 to

50,000 individuals a year, has been reduced to below 10,000 individuals. However, to achieve further reduction of incidental take of seabirds, promotion of research and studies regarding new mitigation measures is necessary.

(ii) Although no international measures are in place in the North Pacific, and small-type near-shore tuna longline fishing vessels not well suited to carry out the mitigation measures for incidental take constitute the majority of vessels, a high implementation rate of 77% was attained. In the future, further efforts will be made to educate fishermen toward full implementation. There is a need for further work to identify which mitigation measures are the most effective and practical for these small-type longline fishing vessels.

(iii) On the other hand, the attainment rate of special measures to implement two or more mitigation measures in the breeding period of Short-tailed albatrosses in Torishima Island was low although the rate of fishing vessels that implemented at least one mitigation measure was high. Therefore, we will continue our efforts toward the full implementation of the NPOA-SEABIRDS especially this special measure.

(iv) In other waters (the Atlantic and the Indian Ocean), incidental take of seabirds is considered to be small, but surveys will be continued.

(4)Information on the incidence and geographical distribution of incidental catches of seabirds

(i) Information from scientific observer programs
The southern bluefin tuna longline fishery has been managed by the CCSBT. Since 1992, scientific observers onboard fishing vessels collect data on ecologically-related species as well as SBT through Real-time Monitoring Program. The observer coverage in 1998-2000 was 3-4% (10-15 cruises a year) of the overall operations by the Japanese fleets. The total number of seabirds incidentally taken in the SBT fishery was estimated at 6,000-9,000 birds a year in 1998-2000. Tori-poles began to be used voluntarily by the Japanese SBT fishing vessels in the early 1990s, and the use became mandatory by the CCSBT in 1997. The stable level of incidental take of seabirds in Japanese SBT fishery seems to reflect the effect of Tori-poles.

Tuna longline fisheries in the Atlantic are managed by the International Commission for the Conservation of Atlantic Tuna (ICCAT), and the onboard scientific observer program has been conducted since 1995. The incidental take rate of seabirds was extremely low, with only six shearwaters in about 1,300 operations by research vessels and training vessels

Since 1994 information has been collected on those species other than targeted fish in the longline operation conducted by the research vessels owned by local governments and the training vessels of fisheries high schools. Operations by these vessels mainly cover the fishing grounds in the North Pacific. Species composition of seabirds taken in these experimental operations is assessed by biologists on the basis of photos taken onboard. Laysan albatross (*Diomedea immutabilis*) and black-footed albatross (*Diomedia nigripes*) constitute the majority of seabirds taken incidentally, and a small number of streaked shearwater (*Calonectris leucomelas*), wedge-tailed shearwater (*Puffinus pacificus*), sooty shearwater (*Puffinus griseus*), blue-footed booby (*Sula nebouxii*) were recorded. There has been no record of Short-tailed albatross being captured. The incidental takes of Laysan and black-footed albatrosses occur mostly in the area north of 20˚N, but their geographical distribution show latitudinal segregation: catch rates of Laysan albatross are higher in the northwestern Pacific to the east of Japan, whereas black-footed albatrosses are caught more in the central North Pacific and in the eastern Pacific.

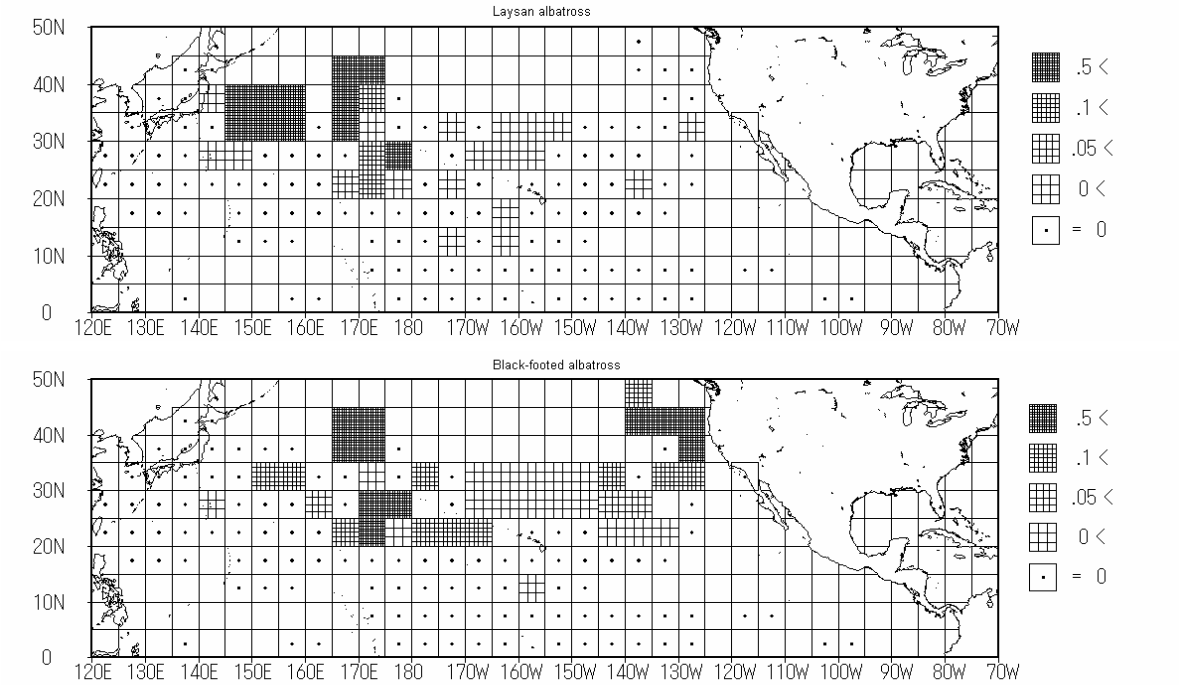

Fig. 1. Map of average catch rates of Laysan albatross and black-footed albatross in longline operations by the Japanese research or training fishing vessels in the North Pacific Ocean (per 1,000 hooks, average of 1992-1998).

(iii) Information from commercial fishing vessels

Submission of logbook reports for non-targeted species caught secondarily or incidentally has been required since 1992 with respect to tuna longline fishing vessels managed by the national government. Analysis of these logbook data from commercial vessels shows that incidental take of seabirds occur mainly in the belt-like areas extending latitudinally from 25 degrees north to 40 degrees north in the North Pacific. The total number caught in a year was estimated at 2,000 in the western Pacific and 6,000 in the central Pacific and 1,000 in the eastern Pacific.

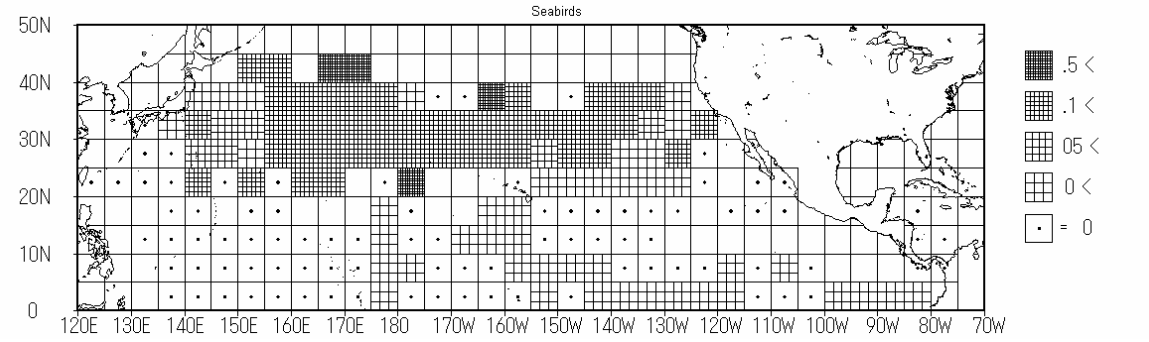

Fig. 2. Map of average catch rates of seabirds in the commercial longline operations by the Japanese fishing vessels in the North Pacific Ocean (per 1,000 hooks, average of 1993-1998).

3. Status of seabird populations relevant to Japanese longline fisheries

(1) Trends of albatross populations in Japan and adjacent waters

Three species of albatross breed on small islands of Japan. The breeding of Short-tailed albatross is now confirmed only in Torishima Island of Izu Islands and Minami-kojima and Kita-kojima Islands of Senkaku Islands.

In the 19th century, large numbers of Short-tailed albatross bred on the Torishima Island and other islands off Japan, but the number declined sharply because of overexploitation for harvesting feathers. This species was believed to be extinct in 1949, but about 10 birds were re-discovered on Torishima Island in 1951. Since then, conservation activities have been promoted to improve the environment of breeding grounds. Subsequently, short-tailed albatross of Torishima Island have shown a steady increase up to the total estimates of 1,400 birds in 2002.

Little information is available about the short-tailed albatross of the Senkaku Islands, but in 2001, approximately 180 birds were breeding on the Minami-kojima Island, showing increasing trends of the population. In addition to Minami-kojima Islands, breeding was also confirmed in a new colony in the Kita-kojima Islands in 2002.

Black-footed albatross breeds mainly on the Hawaii Islands. This species also breeds on the islands around Japan: Torishima Island of Izu Islands (about 1,300 pairs), Mukojima Island of the Ogasawara Islands (about 400 pairs), and Senkaku Islands (about 30 pairs). The number of breeding pairs in the Torishima Island are showing an increasing trend: about 500 in the early 1980s, 700-750 pairs in 1996 (Hayashi et al. 1997). The black-footed albatross in Mukojima Islands are also said to be increasing in number, but no detailed information is available for the seabirds on Senkaku Islands.

Laysan albatross is the most abundant albatross species inhabiting the Northern Hemisphere. Their major breeding grounds are located on the Hawaiian Islands. Small numbers of breeding birds (20-30 pairs in total) are observed in Japan on Torishima Island and Mukojima Island of the Ogasawara Islands.

(2) Trends of albatross populations in the central and eastern Pacific

The Hawaiian Islands in the central Pacific hold the main breeding grounds of Laysan and Black-footed albatrosses. In the Hawaiian Islands, the number these albatrosses had been affected by harvesting for feathers and eggs from the late 1800s to the 1930s, and military activities since the middle of the 1990s. Protection and management of albatrosses in the Hawaiian Islands are currently conducted by the USFWS.

Laysan albatross in the Midway Atoll accounted for about 70% of the total, and the number of breeding pairs were estimated at 387,854 in 1996. A few pairs (about 50 pairs) breed in the Guadalupe Island and in the Clarion Island in the eastern Pacific. The overall number of pairs are estimated at about 550,000 pairs in 1996. The population trend of the Laysan albatrosses is considered to be stable.

Large breeding colonies of Black-footed albatross exist in Laysan Island and Midway Island of the Hawaiian Islands, and 23,000 pairs and 20,500 pairs bred in 2000, respectively. The total number of pairs in the world is estimated at 54,500. The number of individuals of this species is considered to be declining in recent years.

A total of 18,000 pairs of Galapagos albatross breed on the Galapagos Islands and La Plata Island in the eastern tropical Pacific. Since this is a coastal species and their distribution range is limited to the narrow area around the breeding islands, there is little possibility for this species to be caught in

Japanese longline fisheries.

(3) Trends of seabird populations in the Southern Hemisphere

Much published information is available regarding the trends of populations of albatrosses and petrels in the Southern Hemisphere (e.g. Croxall and Gales 1998, Gales 1998, Birdlife International 2000). Population trends of albatross species by breeding sites were reported by Tichell (2000) and Gales (1998). Populations of Amsterdam, Southern Royal, Light-mantled, Buller's, Shy, Atlantic Yellow-nosed, Chatam and Salvin's albatrosses show stable or increasing trends. Conversely, those of Tristan, Wandering, Northern Royal, Sooty, Indian Yellow-nosed, Grey-headed, Campbell and Black-browed albatrosses show decreasing trends (IUCN 2000; IUCN Red List of Threatened Species: http://www.iucn.org/redlist/2000/index.html).

4. Impact of factors other than fisheries on seabird populations

Seabirds have two life phases consisting of feeding at sea and breeding on land. Therefore, it is important to manage the ocean and the land environment in a comprehensive manner for the conservation of seabirds. Large seabirds such as albatrosses have been subject to the impacts from various natural and human factors, and efforts have been expended to identify and minimize detrimental factors.

(1) Factors affecting breeding colonies on land

(i) Albatross populations in Japan
Historically, hunting by humans is the largest factor impacting the breeding colonies of albatrosses around Japan. Short-tailed albatrosses decreased from the 19th century because of over-exploitation for feathers, and many breeding colonies disappeared on the islands around Japan. Hunting or collection of eggs of short-tailed albatrosses no longer takes place since it was designated as a special protected species of Japan in 1962. Other seabirds are also managed in their breeding areas in Japan under the Wildlife Protection Law.

Torishima Island, which holds the major breeding ground of short-tailed albatross, is a volcanic island, and the breeding colonies are affected by landslides due to rain and storm. Further, volcanic re-eruption on Torishima Island in August 2002 caused concern over the effect on the breeding colonies of short-tailed albatross.

Introduced and feral animals are also threatening seabirds. In Ogasawara Islands, where breeding colonies of black-footed and Laysan albatrosses exist, grazing activities by introduced goats are destroying vegetation and causing landslides in the deserted areas. In Torishima Island, predation by crows and feral cats caused problems, but they were exterminated in the 1970s. Black rats are found even today, but no reports of predation on eggs and chicks of short-tailed albatross have been made. When large numbers of short-tailed albatross were breeding on the Torishima Island in the past, diseases caused by ectoparasitic mites were considered as one of the causes of chick mortality. Even at present, mites occurs in high density in the breeding grounds of black-footed and short-tailed albatrosses, but the effects of mites on host birds have not been assessed.

(ii) Other Pacific Albatrosses
Main breeding grounds of black-footed and Laysan albatrosses are located on the Hawaiian Islands. Some the breeding grounds were destroyed by development on the islands such as construction of airports. Interactions with airplanes exist even today. Other factors affecting breeding colonies

include predation on eggs and young by cats, rats and pigs, destruction of plants by herbivorous animals like rabbits, parasitic disease caused by mites, and viral diseases transmitted by mosquitoes (Tickell 2000).

(2) Factors affecting albatrossess at sea other than fisheries

Sharks are known predators of albatrosses at sea. On the Hawaiian Islands, it is known that fledglings are attacked by tiger sharks. Also, marine pollution due to organochlorine residues is reported to impair hatching success by thinning of eggshells. Ingestion of floating marine debris is known to occur commonly in albatrosses. Ingestion of large amount of plastic debris in chicks, fed by their parents, sometimes causes dehydration and digestive problems. Plastic and other objects are often found in the stomach contents of young Short-tailed albatross in Torishima Island. However, its impacts on growth and survival of young birds have not been assessed.

5. Improvement of the environment for short-tailed albatross breeding on Torishima Island

Short-tailed albatross were once breeding at many locations including Torishima Island of Izu Islands, Mukojima Islands of Ogasawara Islands, Okinodaitojima Island, Senkaku Islands, and so on. Since the Meiji Period (1868-), they had been over-exploited for feather trading, and were thought to be extinct in 1949. However, in 1951, survival of about 10 birds was confirmed on Torishima Island. This re-discovery prompted designation of this species as a Protected Species under the Cultural Properties Protection Act in 1958. In 1962, it was uplisted to the Special Protected Species (Hasegawa 1999). Along with this designation, the Torishima Island Observatory of the Meteorological Agency was commissioned by the Cultural Properties Protection Committee to promote protection and surveillance of short-tailed albatross. Since 1976, Mr. Hiroshi Hasegawa, Associate Professor of the Science and Engineering Department of Toho University has been making continuous efforts for conserving and monitoring short-tailed albatross on Torishima Island.

In 1972, the Environment Agency designated this species as special bird in accordance with the Law concerning Protection of Special Birds. At present, it is designated as a rare wildlife species in Japan in accordance with the Law concerning the Conservation of Rare and Endangered Species of Wild Fauna and Flora, and hunting and killing of the individuals are strictly forbidden. Further, in 1954, the entire area of Torishima Island (453ha) was designated as the national protection area for birds and animals, whereby their habitats are being protected. From 1981, a protection project by the Environment Agency (now the Environment Ministry) and the Tokyo Metropolitan Government was launched. In 1994, the project was designated as the project for propagation based on the Law concerning Conservation of Endangered Species of Wild Fauna and Flora. At present, this project is implemented through entrustment to Yamashina Bird Research Institute and the Tokyo Metropolitan Government by the Environment Ministry. Furthermore, the Yamashina Bird Research Institute and Mr. Hasegawa, Associate Professor of Toho University, are conducting monitoring surveys on their own.

In Torishima Island, the Torishima Island Observation Station of the Meteorological Agency promoted improvement of the breeding environment from the 1960s by exterminating feral cats, and transplanting, cutting or fertilizing *Chrysanthemum* shrub. In Torishima Island, landslides due to volcanic nature of the island constituted a serious cause of mortality of young birds. For this reason, the Environment Agency and the Tokyo Metropolitan Government, at the proposal of Associate Professor Hiroshi Hasegawa of Toho University, had conducted a project to stabilize the substratum of breeding grounds to protect the colonies of short-tailed albatross from landslide and mud flows by setting up wooden fences, and transplanting shrubs.

The location of the major breeding colony of short-tailed albatross, Tsubamezaki of Torishima Island, is not optimal for holding large number of breeding pairs because the sloping area is vulnerable to landslides and possible volcanic eruption in the future. Considering these situations, a project was launched since 1991 to induce breeding colonies to another flat stable place (Hatsunezaki) by using decoys and playback of recorded calls through laud speakers. As a result, a pair of short-tailed albatross started reproduction in Hatsunezaki in 1995. To the present time, five hatchings were confirmed in this area, and young birds, which fledged from the breeding ground, were observed to have returned to the same place at the age of 3 in 1998.

In Mukojima Islands of Ogasawara Islands, vegetation has been destroyed mainly by feral goats. As a result, desertification and landslides are causing damage to the breeding habitat of the black-footed albatross. For this reason, the Tokyo Metropolitan Government conducted projects to exterminate goats, and recover vegetation in Mukojima Islands since 1994.

6.Research and development

(1) Development, assessment and improvement of the mitigation measures to avoid incidental take of seabirds

In developing mitigation measures to avoid incidental take of seabirds, efforts have been made to encourage spontaneous creativity of the fishermen, and a number of potential methods have been tested. In evaluating the methods, consideration was given not only to reducing incidental take of seabirds effectively, but also to ensuring safety and labor conditions in fishing operations, to not lowering catch efficiency for main targeted fish species, and to cost effectiveness. It is expected that, by developing many available methods satisfying those conditions, it will be easier for fishermen to apply mitigation measures suited to their own operational conditions.

(i) Tori-pole
Tori-pole is a line and streamers towed from a pole installed at the stern, which deters seabirds from taking baited hooks during line setting. Since albatrosses are poor in flight maneuverability, their feeding behavior is prevented when obstacles are set above the baited hooks cast onto the water surface.

This device was originally invented by Japanese tuna longline fishermen and had been used on a voluntary basis in order to prevent bait loss caused by seabirds. It drew attention of Nigel Brothers of Tasmanian Parks & Wildlife Service, and improvements were made for wider use of the device with the cooperation of the Federation of Japan Tuna Fisheries Cooperative Association. At present all the southern bluefin tuna longline fishing vessels are obliged to use this device during line setting.

Effectiveness: It has been confirmed that the Tori-pole can reduce the catch rate of seabirds down to about 30% on average when it is used for tuna longline fishing vessels. However, the effectiveness of Tori-pole varies according to various factors such as sea conditions and configuration and use of the Tori-pole. It is important to adjust the length and the angle of the pole so that the streamer line is placed right above the baited hooks.

Costs and defects: This device is relatively low-cost, and can be deployed with minimal modification of fishing vessels, fishing gear and fishing operations. Problems with the main line entangling with fishing gear or screw can occur during the operation. When weights are attached to the streamers, there is a danger that crew working on the deck during line setting could be hit by the weights. Initial operation and retrieval of the Tori-pole causes more time and labor during line setting.

Future tasks: It is essential to educate fishermen to be fully versed in using this device to maximize effectiveness. Mechanized poles and reels powered by hydraulic pressure or electric motor are easy to use, and position of lines can be adjusted without labor. Installation of such mechanized instruments on newly constructed vessels will be encouraged because it will lead to increase in deterrent effectiveness and labor saving during operations. As installation of a large-scale device is difficult for small-type fishing vessels, development of specifications suited for small-type vessels will be promoted.

(ii) Waterjet device
This device deters seabirds from baited hooks by jetting high-pressured water, instead of using lines of Tori-pole and streamers. Unlike Tori-pole, waterjet device can be taken on and off easily, and it is free from troubles with propeller and fishing gear.

Effectiveness: Results of at sea experiments have shown that waterjet is effective in deterring birds as seabirds avoided flying below the water curtain. However, the effective range of waterjet is basically dependent on the capacity of the water pump, although it can be improved by the shape of the nozzle tip to some extent. Furthermore, the waterjet is affected by winds. The effective range is reduced at the time of strong head wind and side wind.

Costs and defects: Water pumps with large capacity are large in size, heavy and costly, so their installation location is limited.

Future tasks: This device alone can not attain full deterring effectiveness because effective range of waterjet is affected by pump and winds. Some commercial fishing vessels use hose water as a supplementary means to deter seabirds in the nearest range where Tori-pole is not very effective.

(iii) Other deterrent devices
Various stimulants, such as sound (explosive sounds, sounds of predatory animals, and distress calls of seabirds), magnetic power, lights (flash and laser beam), and electricity (DC pulses) have been tested to deter seabirds from fishing vessels.

Effectiveness: Explosive noise can deter birds temporarily, but birds will get used to the sounds if repeatedly used, thereby reducing the effectiveness of the device. Although at-sea experiments have not covered all of the potentially available devices, none have yet shown to be practical and effective.

Costs and defects: A large budget is needed for the development and experimentation of new devices.

Future tasks: Small-scale preliminary experiments and at-sea experiments will be conducted for potentially effective devices.

(iv) Improvement of sinking speed of baited hooks
This is a method to prevent incidental take of seabirds by sinking the baited hooks to the depth where seabirds cannot reach, because albatrosses are not good at diving in general.

There are several methods in enhancing sinking rates of baited hooks: weighting branch lines, fully thawing baits, and throwing baits so as to avoid turbulence caused by propeller currents.

Effectiveness: It has been demonstrated experimentally that sinking speed is improved if the weight is attached to the tip of a branch line. Terminal weight can be increased by several methods such as adding a weight, using fully thawed baits, and using fluorocarbon line which is heavier than conventional nylon leader. Use of bait-casting machine has advantages in avoiding propeller

turbulence and in throwing baited hooks into the effective area of the Tori-pole.

Cost and defects: As weighted branch lines requires modification of fishing gear, cost is incurred and might affect catch efficiency of targeted fish. Further, weights attached to branch lines may cause danger if they hit the fishermen during line hauling.

Future tasks: Weighting method should be improved so as not to affect safety of fishing crew and catch efficiency.

(v) Underwater line setting
This is a method to set baited hooks directly underwater not by throwing them in the air. Underwater setting ducts are commercially used in bottom longline fisheries, but practical application in pelagic tuna longline is difficult because of the complex structure of the fishing gear. Some experimental devices have been designed and are being tested in Japan.

(vi) Line setting at night
As most albatrosses search food during daytime depending on their vision, nocturnal line setting can reduce the occurrence of incidental take.

Effectiveness: Night setting is commonly adopted in demersal longline fisheries. It is known that the effectiveness is reduced when the moonlight is bright.

Cost and defects: If line setting is limited only to nighttime, working schedule may become too demanding for the crew. Although the use of light should be minimized to ensure effectiveness of night setting, safety of the crew should also be ensured.

Future tasks: Acceptable conditions for fishermen to adopt night setting should be arranged by ensuring safety of the work and by clarifying that fishing rate of main targeted fish species is not lowered.

(vii) Colored bait and artificial bait
Colored bait is a method to dye the baits blue so that it becomes difficult for seabirds to detect visually from the air. Baits are dyed with edible coloring pigments. Artificial bait made of moulded squid viscera has been produced commercially in Japan.

Effectiveness: It was confirmed that the feeding activities of seabirds are prevented when blue-colored baits are used. As a result, the incidental take rate of seabirds is reduced to a minimal level. Available data demonstrated that blue-colored bait does not have significant effect on the fishing rates of main targeted fish species.

Cost and defects: Costs of pre-dyed baits are currently very expensive. Onboard dying increases labor of fishing crew and is difficult under stormy conditions.

Future tasks: Reduction of the cost pre-dyed baits or development of labor-saving onboard dying process is needed to increase use of this method. For artificial bait, further examination should be made on the catch rates of targeted fish and seabirds and other untargeted species.

(viii) Summary concerning mitigation techniques
In developing bird-avoiding techniques, not only the research and studies but also the information from fishermen actually working at sea are important. It is important to develop various possible methods through the research and studies, and to show them to fishermen, to test them in the actual fishing

grounds, and to collect feedback information from the fishermen about the effectiveness and weak points. In this respect, the development and research and the educational and publicity activities have been promoted in parallel in Japan. Fishermen will be ready to adopt avoidance measures if there are a number of possible methods which are cost effective and having little or no problems in application. Tori-pole is a conventional method with substantial effectiveness, but efforts should be made to develop configurations suitable for small sized of vessels, and to educate fishermen for increased and better usage of the instrument. Although blue-colored bait is a hopeful method with high potential, costs and labor in preparing colored baits need to be reduced. Improvement of sinking speed, if it is combined with other deterrent methods, is expected to reinforce the effectiveness of mitigation techniques. Further efforts should be made to find a method, which cause less burden and risk to fishermen. Supplementary methods such as night line setting and strategic offal discards will be improved taking the views of fishermen into account.

(2) Research and studies on the biology of seabirds

(i) Surveys on pelagic distribution of albatrosses in the North Pacific
Sighting surveys on seabirds have been conducted using research vessels in order to clarify geographical distribution and temporal changes of albatrosses in the northwestern Pacific near Japan. Short-tailed, Laysan, and black-footed albatrosses are found in the waters near Japan from late autumn to late spring. The results of sighting surveys show that density of Laysan and black-footed albatrosses are high in the area off the Pacific coast of northeastern Japan, where the Kuroshio and Oyashio currents mix. Several individuals of short-tailed albatrosses were also observed in the same area from late autumn to late spring.

Satellite tracing of short-tailed albatross of Torishima Island was started in 2001 cooperatively with the USFWS in accordance with the Japan-U.S. Treaty on Migratory Birds. The satellite data showed that short-tailed albatrosses started migration from Torishima Island in May, and moved north to the Bering Sea and the Gulf of Alaska along the Pacific coast of Japan and Aleutian Islands.

These results indicate that the coastal waters in the western North Pacific off Japan and Aleutian Islands are important habitat for short-tailed albatrosses during the breeding period and the migrating period.

(ii) Research on feeding ecology
Albatrosses and Petrels that compete with tuna longline fisheries have two different methods for feeding: scavenging and live capturing. The dependence on these two methods differs according to the species. Knowledge on the feeding habits of seabirds will help to estimate the vulnerability of seabird species to interactions with fisheries. For this purpose, stomach content analysis and stable isotope analysis has been conducted in Japan. Results of the preliminary analysis suggested a possibility that there are two types of albatrosses in the Southern Ocean: one derives their food largely from baits from fishing vessels and the other shows less dependence on fishing baits.

(iii) Research on identification of seabirds
Through the studies on external morphology of bills, practical methods are developed to identify the albatross species based on bill shape and color. Educational materials for onboard scientific observers, trainers and officers of the experimental and training vessels have been made to improve the accuracy of data collected from these people. It is also applied to the booklets for fishermen and has been used for enlightenment and improvement of information reported from commercial vessels.

(iv) Research activities on the breeding locations

In the Environment Ministry, tagging surveys has been conducted in major habitats of many bird species including seabirds. Research and monitoring has been conducted continuously on many breeding locations of seabirds in Japan. Especially, with respect to seabirds designated as rare species of wildlife species in Japan in accordance with the Species Conservation Law, such as Short-tailed albatrosses, Tuffed puffin (*Lunda cirrhata*), Common murre (*Uria aalge*), efforts have been made to collect information on their breeding condition and population status. In 2000, a project was launched to build a database on breeding colonies of seabirds through cooperation with the Japan Seabird Study Group.

7. Guidance, publicity and educational activities

(1) Preparation of educational and publicity materials.

Educational activities are being carried out for fishermen by circulating materials with a view to educate them of the importance of accurate reporting of incidental take of seabirds, how to avoiding incidental catch, and appropriate handling of individuals captured alive.

The prepared and circulated materials include:
- Identification sheets for " albatrosses and giant petrelsof the Southern Ocean" and "large seabirds observed in the North Pacific"
- Guide Book for Identifying Pelagic Species caught in Tuna Longline Fisheries
- Booklet "Longline fisheries aimed at coexistence with seabirds" that illustrates the method of avoiding incidental take and appropriate handling of seabirds capture alive; and
- Guide Book "Fisheries friendly to marine environment--a manual for implementation (of national plans of action for the reduction of incidental take of seabirds and for the management of sharks).

(2) Educational activities directed at fishermen

The Fisheries Agency, Global Guardian Trust and the National Research Institute of Far Seas Fisheries have been holding seminars for fishers introducing the NPOA-SEABIRDS. Mitigation techniques and the methods to release live birds are taught through seminars and exchange of information is promoted through interviews and free discussion.

(3) Lectures for fisheries high schools

Lectures are given to the teachers of high schools that are engaged in training students for tuna longline fisheries. Explanations are given regarding the importance of the coexistence of fisheries and seabirds, methods of species identification, proper methods of mitigation techniques, and the importance of the collection of accurate data from fishing operations.

8. Promotion of international cooperation

(1) Basic position of Japan

In order to advance "reduction of incidental take of seabirds by longline fisheries", which is an objective of the FAO International Plan on Seabirds, Japan will continue to promote multilateral cooperation in FAO and regional fisheries management organizations such as the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), and the Commission for the Conservation of Atlantic Tuna (ICCAT).

(2) Cooperation in FAO

Within FAO, Japan played an important role in developing the IPOA-SEABIRDS. For this reason, Japan is contributing a trust fund as well as personnel to FAO, and cooperating actively in the implementation of the IPOA-SEABIRDS focusing on assistance in the establishment of National Plans of Action in developing countries.

(3) Cooperation in regional fisheries management organizations

Japan, as a responsible fishing nation, is a member of multilateral regional fisheries management organizations, and has been actively contributing both for monitoring, and research and studies regarding conservation and management of targeted fish species, such as tunas and skipjack under various organizations. Further, with respect to non-targeted species such as seabirds, Japan has been playing a leading role in research on ecology and stocks and introducing methods to avoid incidental take. Regarding seabirds, Japan will continue various types of cooperation in regional fisheries management organizations such as the ERSWG of the CCSBT, the SCRS of the ICCAT and the Working Group on Bycatch of the Inter-American Tropical Tuna Commission (IATTC).

(4) Others

Illegal, Unregulated and Unreported (IUU) fishing activities including flag-of-convenience fishing vessels are deemed not to be complying with conservation and management measures for targeted species such as tunas and skipjack, nor taking any measures to avoid incidental take of seabirds because they are engaging in fishing activities by escaping all the conservation and management measures. To counter those activities, Japan will continue to promote efforts toward elimination of the IUU fishing activities at FAO and regional fisheries management organizations in concert with countries concerned, and will encourage compliance with the IPOA-SEABIRDS for fishing vessels returned from IUU fishing vessels into duly authorized vessels.

Furthermore, Japan is promoting cooperation with countries concerned regarding collection of information, research, monitoring, and implementation of conservation measures regarding distribution, habitat and ecology of seabirds. Specifically, joint monitoring and exchange of information have been promoted regarding Short-tailed albatrosses based on the Japan-U.S. Treaty for Protection of Migratory Species of Birds. We will continue to cooperate toward this goal.