National Report of Japan

Overview of Researches on Ecologically Related Species in Japanese SBT Longline Fishery, 2013

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1. Introduction

Japanese fleet is using only longline gear to catch southern bluefin tuna. Since 1952, Japanese longline operation has started in the Indian Ocean, although southern bluefin tuna was sub-target species for the longline fishery targeting yellowfin and bigeye tuna during the early stage of fishery. This is because of the fact that southern bluefin tuna in the tropical region were mostly spent with low meat quality so fishermen did not target it. Further south fishing grounds in the temperate waters for this species were developed in the late 1950s and 1960s. In addition, the innovation of super cold freezer has accelerated demand of “sashimi” grade southern bluefin tuna meat to the Japanese market. Recently the number of fishing vessels targeting southern bluefin tuna is decreasing continuously due to the strong regulation for stock management and government policy to reduce number of longline vessels several times done in the past.

Regarding the incidental catch of seabirds, tori line was used voluntarily by the fishermen in the early 1990s, and the Government of Japan has introduced a mandatory measure for SBT longliners to use tori line since 1997. Research effort to modify tori line and to develop alternative methods possibly avoiding incidental catch of seabirds have continued. According to the international plans of action for reducing incidental catch of seabirds in longline fisheries and for the conservation and management of sharks, Japan established National Plans of Action in 2001 and has promoting mitigation of incidental take of seabirds and management of pelagic sharks.

2. Review of SBT Fisheries

Fleet size and distribution

The number of fishing vessels has been decreasing since the peak of about 300 in 1985. Fisheries Agency of Japan had reduced number of vessels by 69 in 1981, 100 in 1982 and 132 in 1998. Vessel reduction policy in 1998 would have influenced further decline of number of vessels after then. The number of vessels has been less than 100 recently. Recent fishing grounds were off Cape of Good Hope (Area 9), southern Indian Ocean (Area 8) and water near Tasmania Island (Area 4, 7). The vessels were mainly operating at Area 4, 7, 8 and 9 in the second and third quarters.

Distribution of Catch and Effort

General distribution of southern bluefin tuna catch and effort in 1998-2005 was almost same as the distribution of major fishing grounds mentioned above. Since 2006, however, annual operational patterns and schedule of Japanese vessels targeting SBT have been possibly affected by introduction of the individual quota (IQ) system, abolishing of the seasonal area closure, and drastic/temporal increase of fuel price. Moreover, recent increase of CPUE caused decrease of number of fishing operations targeting SBT.

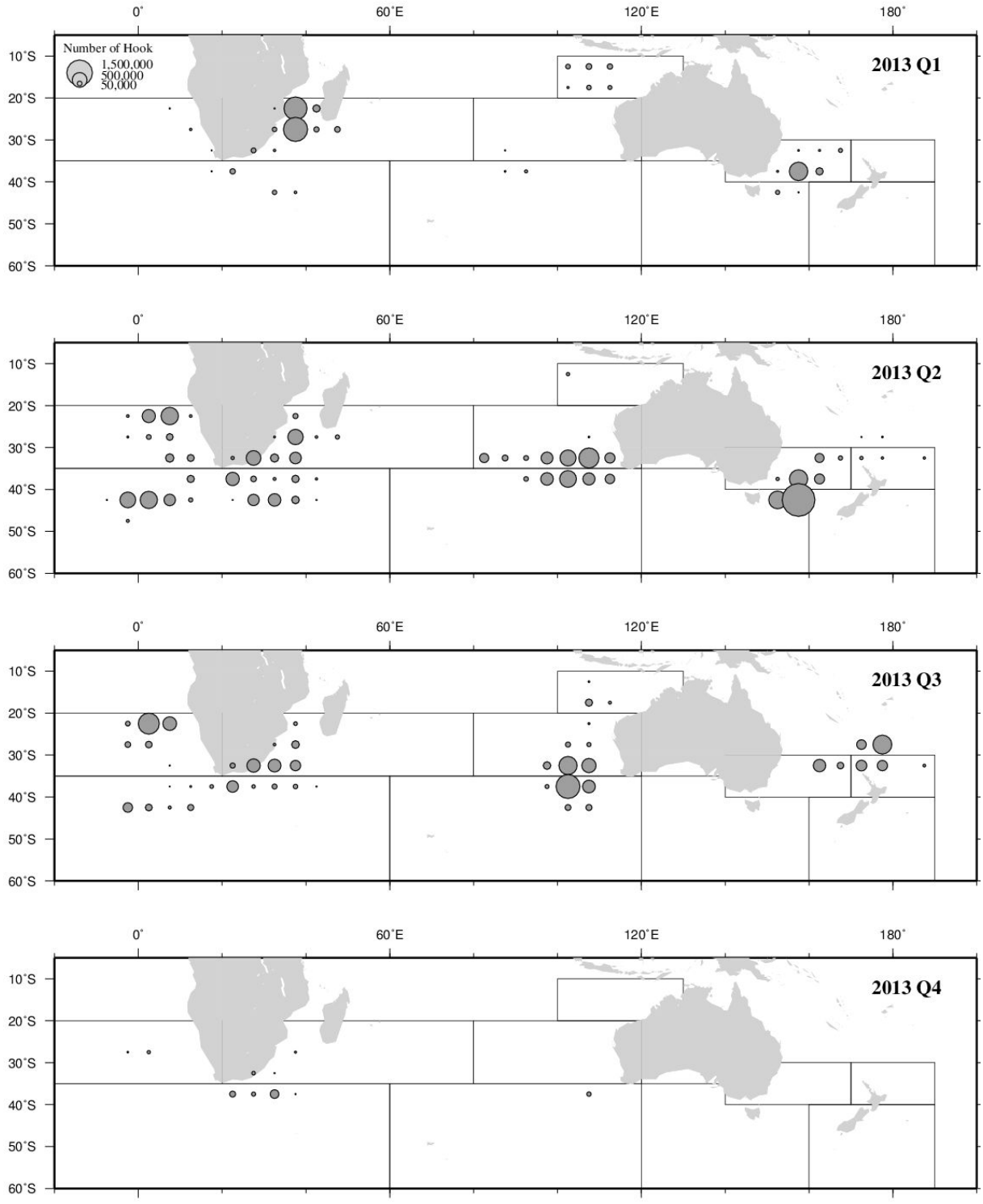


Fig.1. Number of fishing hooks used Japanese RTMP vessels by quarter and 5x5 degrees square in 2013.

3. Fisheries Monitoring for Each Fleet

Since 1991, Fisheries Agency of Japan has carried out Real Time Monitoring Program (RTMP) to monitor the catch of southern bluefin tuna. The number of vessels monitored by the program was 12-15 during 1991-1994, and all the vessels operating southern bluefin tuna fishing ground have been monitored by the RTMP since 1995. Each vessel sends daily reports including fishing position, effort, and catch by species in number and weight to the Fisheries Agency. The information is entered into the database in a short time.

Since 1992, Japan has conducted scientific observer program on southern bluefin tuna fishery and collected information including fishing position, effort, catch of target and non-target species, biological information, incidental catch of seabirds, etc. In 2013, Japan deployed scientific observers to 13 fishing vessels. While the observers were onboard the vessels, the vessels used 1,481,025 hooks in 2013. Coverage of observation was 14.3 % for vessels and 10.2 % for hooks in 2013 (Table 1). The observation effort was tried to be distributed in proportion to the fishing effort for each area and season (CCSBT-ERS/1503/BGD01).

Table 1. Number and coverage of fishing vessels and hooks in the Japanese RTMP observer program in 2013.

Area	Calendar year	Number of all vessels	Number of vessels observed	Cover rate for the number of vessel	Number of hooks used by all vessels (x1000)	Number of hooks used by observed vessels (x1000)	Cover rate for the number of hook
Area 4	2013	22	2	9.1%	2,663	210	7.9%
Area 5	2013	8	1	12.5%	578	32	5.6%
Area 7	2013	28	3	10.7%	3,216	332	10.3%
Area 8	2013	21	3	14.3%	3,545	324	9.2%
Area 9	2013	43	7	16.3%	4,513	582	12.9%
Total	2013	91	13	14.3%	14,515	1,481	10.2%

4. Seabird

The captures and mortalities of seabirds in CCSBT fisheries are summarized in Table 2 (page 13-18). Estimates of annual incidental catch of seabirds in the Japanese southern bluefin tuna longline fishery in 2013 were updated based on the data collected through the scientific observer programs. Annual seabird bycatch were 2,862 (95% CI: 1,257-4,964) in 2013. As a whole, estimates of seabird bycatch have been showing decreasing trends since 2000. Recent estimates of seabird bycatch by the Japanese high-sea SBT longline fishery was approximately 1,000-4,000 birds/year. (Fig. 3, CCSBT-ERS/1503/17).

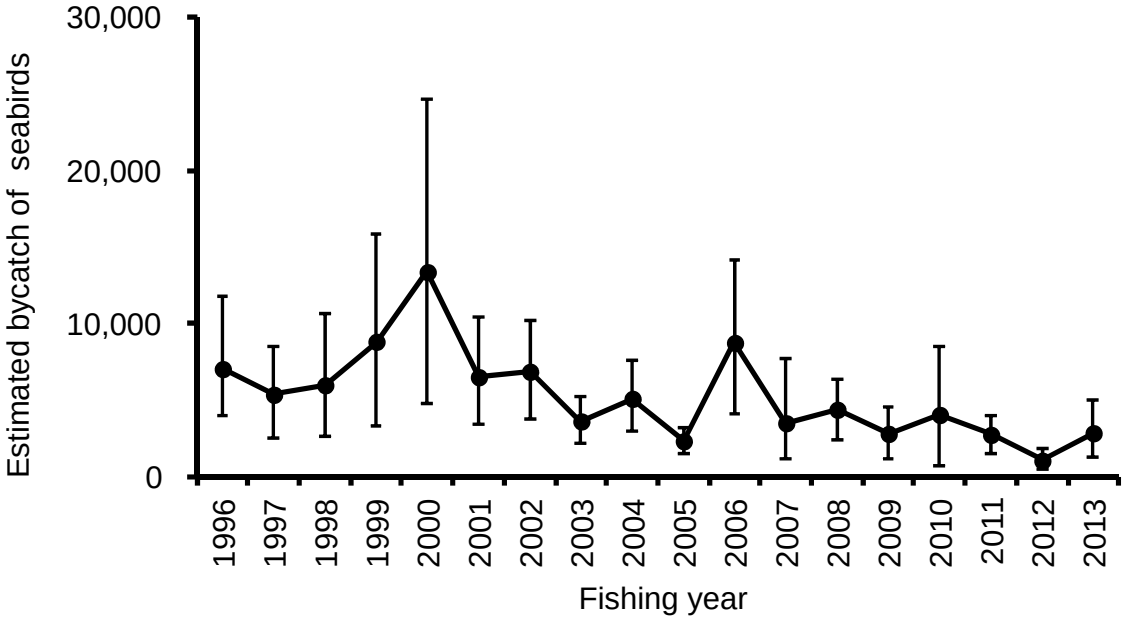
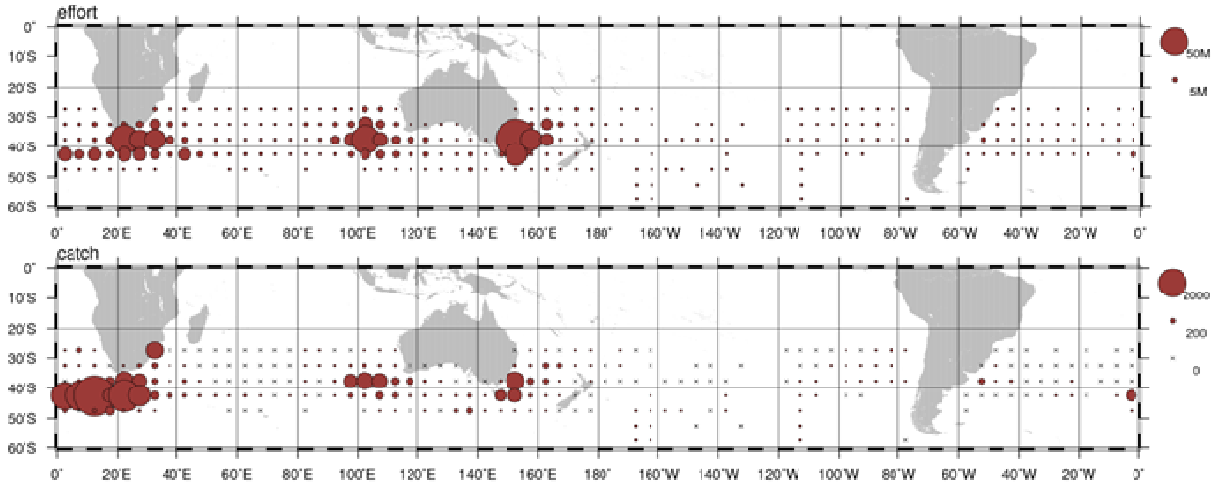


Fig.3. Annual trends of estimated incidental catch of seabirds in the Japanese SBT fisheries. Vertical bars indicate 95% confidence intervals.

5. Other Non-target Fish

The captures and mortalities of sharks in CCSBT fisheries are summarized in Table 2 (page 9-12). Thirteen species of elasmobranchs were reported by the scientific observers in 2013. Blue shark was dominant among elasmobranch catch observed, followed by porbeagle, shortfin mako shark and pelagic stingray.

Japan has collected the catch and effort data of porbeagle (*Lamna nasus*) caught by Japanese distant-water longliners since 1994. For the basic information on the stock assessment of the porbeagle caught in the SBT fishery, log-book data of porbeagle caught in the southern hemisphere as well as the size data collected in the scientific observer program for SBT was summarized. Considering the distribution area of porbeagle in the southern hemisphere, the calculation of logbook data was conducted for the area south of 30°S. Total of 30,892 porbeagles were recorded in the logbook data between 1994 and 2013. Total of 13,725 porbeagles were recorded in the observer program between 1992 and 2013 and size data from 11,378 individuals were available. (Fig.4, CCSBT-ERS/1503/18).



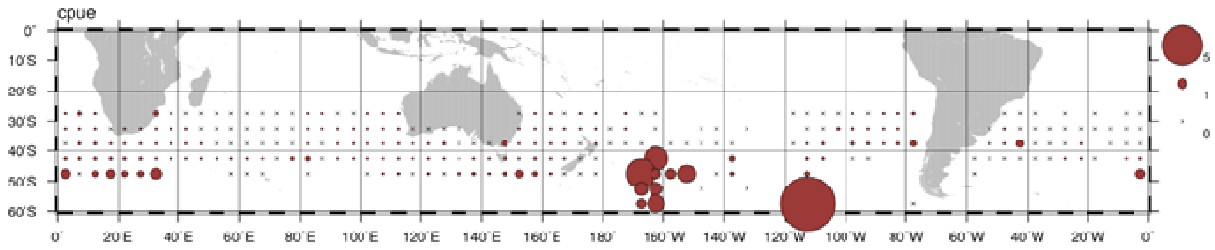


Fig.4. Distributions of hook number, porbeagle catch and CPUE.

Many teleosts were caught by longline fishery other than tunas and billfishes in the SBT fishing ground. Thirty-two species of teleost fish including tuna and billfish were identified in the observer data in 2013. Butterfly tuna, escoler, oilfish, opah, lancetfishe, sunfish and pomfrets were the major components of teleost catch (other than tuna and billfish) recorded in the in the high sea longline fishery (CCSBT-ERS/1503/DGD01).

6. Marine Mammal and Marine Reptile

The captures and mortalities of marine reptile in CCSBT fisheries are summarized in Table 2 (page 20). One tooth whale and no marine reptile were recorded through the Japanese scientific observer program in 2013 (CCSBT-ERS/1503/BGD01). Incidental catch of marine mammal and marine reptile occurred at a negligible level in the Japanese high-sea SBT longline fishery. There is not enough number of observations for the appropriate statistical estimation of the total incidental catch for these animals.

7. Mitigation Measures to Minimize Seabird and Other Species Bycatch

Current Measures

Mandatory Measures:

All tuna longline fishing vessels including those operating to catch southern bluefin tuna are obliged to comply with respective rules of WCPFC, IATTC, IOTC and ICCAT, when operating in the Convention areas of these RFMOs. In addition, the Government of Japan has introduced a mandatory measure for tuna longliners to use tori line while targeting southern bluefin tuna as the terms of conditions of license to avoid incidental catch of seabirds since 1997. The Government of Japan makes this mandatory measure known to every fisherman by specifying in the license.

Recently, new conservation and management measures to mitigate seabird bycatch were adopted at ICCAT, IOTC and WCPFC, and entered into force in July 2013 (ICCAT), and July 2014 (IOTC and WCPFC) respectively. Japan has amended its domestic regulations in compliance with those new measures and implemented. In the Atlantic, Japanese longliners started to introduce the newly adopted mitigation measures in the later half of 2013 in the high latitudinal area of the south Atlantic and observers on-boarded to longlines operating in corresponding area and period reported this activities. National Research Institute of Far Seas Fisheries is now error checking and compiling these data.

The Government of Japan is taking necessary measures to enforce and monitor the level of compliance for bycatch mitigation measures including dispatch of enforcement vessels to the fishing areas, record of mitigation measures deployed through the logbook and collect necessary information by scientific observers on board of operating vessels. The boarding observers and vessels carrying them are carefully selected so that observers can monitor different vessels every year.

Voluntary Measures, including information on proportion of fleet using the voluntary measures:

In February 2001, in accordance with “International Plan of Action for reducing incidental catch of seabirds in longline fisheries” of FAO, the Government of Japan developed “Japan’s National Plan of Action for reducing incidental catch of seabirds in longline fisheries”, in which Fisheries Agency of Japan instructed every fishermen to voluntarily carry out night line-setting, use of weighted branch line or cone to ensure speedy precipitation of bait, use of automatic bait casting

machines and use of properly defrozen bait in addition to the use tori lines which was already mandatory at that time.

Most of Japanese tuna longline vessels use automatic bait casting machines (BCMs), which have an effect to decrease the incidental catch of seabirds by avoiding propeller turbulence, increasing sinking rates of baited hooks, and casting baited hooks constantly below the tori line. In 2013, at least 51% of observed fishing vessels were equipped with BCMs.

Improvement of sinking rates of baited hooks is achieved by the use of weighted branch lines and of thawed bait. Branch lines can be weighted either by attaching lead weights to the nylon leader or by inserting heavy nylon cord in the branch line. It is difficult to assess the detail of fishing gear such as length, material and diameter of hook line, because these information are subject to intellectual property right of fishermen. Some observed vessels used lead-cored branch lines in 2013.

Measures under Development/Testing

1) Mitigation Measures:

Performance of weighted and un-weighted branchlines deployed with revised “hybrid” tori lines on two Japanese vessels participating in the 2010 tuna joint venture fishery in the South Africa EEZ was compared in collaboration with the Washington Sea Grant, University of Washington and Japan. This study showed that branchline weighting was highly effective at preventing seabird attacks within the aerial extent of streamer lines and allowing none between the two hybrid streamer lines in diving seabirds dominated system. The higher rate of tangling of weighted branchlines relative to un-weighted branchlines is the only remaining barrier to making branchline weighting practical.

Effectiveness of hybrid tori-lines with and without weighted branch lines to a control of no mitigation was compared in the North Pacific from December 2011 to June 2012. The results suggested that sole deployment of well-designed tori-lines dramatically reduce incidental catch of albatrosses by pelagic longline fisheries in the western North Pacific, and therefore are recommended as best-practice seabird mitigation for these fisheries.

Effectiveness of aerial extent of tori line (long aerial extent: 85m, middle: 70m and short: 50m) to reduce incidental catch of seabirds was examined using Japanese research vessel in the North Pacific from April to June 2013. The results showed that long and middle aerial extent of tori lines were more effective in preventing seabird attacks and incidental catch of seabirds than short aerial extent.

Effectiveness of tori-line and line weightings (lumo lead) by Japanese research vessel was examined in the North Pacific from April to May 2014. The result indicated that tori-line and lumo-lead are effective mitigation measures for tuna longline operations in the North Pacific.

The further research on tori-line and line weighting should be useful to reduce incidental catch of seabirds in the north Pacific.

Mitigation measures to reduce incidental catch of sea turtles in longline fishery have been developed and experimented in Japan according to the FAO guidelines to reduce sea turtle mortality in fishing operations. FRA is conducting surveys on the effects of circle hooks on catch rates of sea turtles, tuna and shark.

Experiment of large circle hooks (Koshina type 4.5-sun similar to foreign type 18/0) on catch rates of target species and sea turtles are on the way through operations of commercial longline in the North Pacific 2013 and 2014. The use of circle hooks is effective to reduce incidental catch or deep hooking of sea turtles. Most of sea turtles caught by shallow longlines were retrieved alive. The result indicates that careful live retrieval and release is effective in improving the post-hooking survival of hooked sea turtles.

De-hooking devices and sea turtle handling manuals are developed to improve post-hooking survival of sea turtles.

2) Conservation and Management

Large number of leatherback turtles is known to nest in Jamursba-medi and Wermon, West Papua, Indonesia. Nest counts, assessment of hatching success, and improvement of nesting environments for leatherbacks have been conducted since 1999 in Indonesia with the collaboration of the Indonesia Sea Turtle Research Center and Everlasting Nature of Asia, which is a Non-Profit Organization (NPO) in Japan. The nesting survey revealed that Indonesian population of leatherback turtles were suffering from poor reproductive success due to beach erosion, egg predation and low hatching rates. The Everlasting Nature constructed electric fences in the highest-density nesting area to prevent pig predation on leatherback eggs. The electric fence drastically reduced the predation rates of eggs. Sea turtle populations have been affected by many factors on land and at sea (disappearance of nesting beaches, hatchling production, predation of eggs and turtles, interaction with fisheries such as trawl, gillnet, set-net, trap, purse-seine, and longline). Therefore, holistic management is necessary for the conservation of sea turtles, especially leatherback turtles.

8. Public Relations and Education Activities

Public Relations Activities

1) Educational materials, including booklets pamphlets, video program (DVD/VHS), cartoons were prepared by FRA, the Global Guardian Trust (GGT), and the Organization for the Promotion of Responsible Tuna Fisheries (OPRT), and were distributed to fishermen and other parties related to fishing industry to explain the importance of reducing incidental catch of seabirds and sea turtles.

-Identification guide for sharks, seabirds and sea turtles.

-Booklets and leaflets that illustrate methods for avoiding incidental catch and appropriate handling of seabirds and sea turtles;

-A guide book which summarizes the NPOA-Seabirds and NPOA-Sharks.

-A video program (VHS and DVD) which explain mitigation measures to reduce longline interactions with seabirds and sea turtles.

2) Under the government contract and with the cooperation of FRA and tuna fishing industries, GGT and Japan NUS had hold seminars for fishers at key fishing ports of longline fleets in Japan. In these seminars, mitigation techniques and methods for releasing live birds were explained by using various kinds of educational materials. Furthermore, they distributed tori lines and circle hooks to longline fishers, without charge, to facilitate the use of tori lines and circle hooks, and to test their effectiveness in commercial fishery. They also continued information exchange with fishers through discussion and questionnaires at the seminars and through port-side interviewing with fishers about practical usage and innovation/improvement on tori lines and other mitigation measures.

Education

Crew training, especially ship masters

The Federation of Japan Tuna Fisheries Co-operative Associations has hold seminars for crew members, ship masters and ship owners in fishing ports (i.e. Kesen-numa). Also, the Federation of Japan Tuna Fisheries Co-operative Associations has distributed brochures on bycatch mitigation to Japanese longliners at foreign ports (i.e. Cape Town). The Federation of Japan Tuna Fisheries Co-operative Associations will continue this effort.

Observers

Before the cruises, scientific observer candidates have to take a training seminar. JOP held the training seminars twice a year to train scientific observers in 2013. During the training seminars, the candidates brushed up their knowledge and skills on research method, recording procedure and safety. Some training included the practical training with the actual tuna to measure the fish size and to collect the biological samples. After the return from the commercial longline vessels, every observer reported their research activity. Their experiences and information have been used for the improvement of the observer program and next research activity. (CCSBT-ERS/1503/BGD01).

9. Information on other ERS (non-bycatch) such as prey and predator species

The diet of juvenile (predominantly age 1) southern bluefin tuna *Thunnus maccoyii* (SBT, N = 720), caught over 11 years of the recruitment monitoring survey off southern Western Australia during summer, consisted overwhelmingly of teleosts (97.4% by volume). Pilchard *Sardinops sagax* (27.4%V), blue mackerel *Scomber australasicus* (16.7%V), and jack mackerel *Trachurus declivis* (14.2%V) were the major taxa, with pilchard more abundant in coastal waters and jack mackerel more frequently encountered in fish caught closer to the shelf-edge. Prey size varied from 5 to 240 mm, with 67% of ingested items measuring between 30 and 50 mm. Pilchard dominated the prey size category 130–190 mm (84% by number), but the overall contribution of this species to the diet of juvenile SBT was much lower than previously reported. Future research in relation to the feeding ecology of juvenile SBT should focus on the biology and ecology of the young lifestages of the main prey species in this area and on prey distribution and dynamics as a key factor linking environmental change and SBT distribution.

10. Others

No other information.

11. Implementation of the IPOA-Seabirds and IPOA-Sharks

Japan developed its own National Plans of Action (NPOAs) for both seabirds and sharks in 2001 according to the FAO International Plans of Action (IPOAs) and revised them in 2009 taking into account the latest management measures taken by several RFMOs. Further revision of the NPOAs is now underway. Fisheries Agency of Japan (FAJ) disseminated the NPOAs to fishermen through local governments and fishermen's organizations. FAJ has reviewed implementation status of these two NPOAs and submitted its implementation reports to the FAO Committee on Fisheries (COFI) every two years since 2003.

Table 2: Reporting form for estimation of total mortality of ERS in CCSBT fisheries

Country Japan Year (calendar year) 2013

Species (or group) Blue shark

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[1]	Total Observed Effort[1]	Observer Coverage[2]	Captures (*number*)	Capture Rate[3]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	57	0.424	0	0.000	53	
5	578,392	20,695	3.6%	20	0.966	0	0.000	20	
6	0	0							
7	3,215,778	226,214	7.0%	220	0.973	16	0.071	159	
8	3,544,765	250,020	7.1%	678	2.712	264	1.056	409	
9	4,513,234	492,110	10.9%	582	1.183	434	0.882	144	
TOTAL									

[1] For longline provide number of hooks, for purse seine provide number of sets.
[2] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[3] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Shortfin mako shark

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[4]	Total Observed Effort[1]	Observer Coverage[5]	Captures (*number*)	Capture Rate[6]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	39	0.290	24	0.178	13	
5	578,392	20,695	3.6%	8	0.387	2	0.097	6	
6	0	0							
7	3,215,778	226,214	7.0%	30	0.133	18	0.080	12	
8	3,544,765	250,020	7.1%	12	0.048	10	0.040	2	
9	4,513,234	492,110	10.9%	10	0.020	8	0.016	2	
TOTAL									

[4] For longline provide number of hooks, for purse seine provide number of sets.
[5] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[6] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Porbeagle

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[7]	Total Observed Effort[1]	Observer Coverage[8]	Captures (*number*)	Capture Rate[9]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	0	0.000	0	0.000	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	77	0.340	5	0.022	71	
8	3,544,765	250,020	7.1%	46	0.184	22	0.088	24	
9	4,513,234	492,110	10.9%	171	0.347	83	0.169	86	
TOTAL									

[7] For longline provide number of hooks, for purse seine provide number of sets.
[8] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[9] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Other sharks

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[10]	Total Observed Effort[1]	Observer Coverage[11]	Captures (*number*)	Capture Rate[12]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	20	0.149	0	0.000	20	
5	578,392	20,695	3.6%	2	0.097	0	0.000	2	
6	0	0							
7	3,215,778	226,214	7.0%	15	0.066	2	0.009	9	
8	3,544,765	250,020	7.1%	14	0.056	2	0.008	12	
9	4,513,234	492,110	10.9%	32	0.065	4	0.008	25	
TOTAL									

[10] For longline provide number of hooks, for purse seine provide number of sets.
[11] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[12] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Large albatrosses

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[13]	Total Observed Effort[1]	Observer Coverage[14]	Captures (*number*)	Capture Rate[15]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	4	0.030	4	0.030	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	4	0.018	3	0.013	1	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	12	0.024	10	0.020	2	
TOTAL									

[13] For longline provide number of hooks, for purse seine provide number of sets.
[14] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[15] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Dark coloured albatrosses

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[16]	Total Observed Effort[1]	Observer Coverage[17]	Captures (*number*)	Capture Rate[18]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	0	0.000	0	0.000	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	0	0.000	0	0.000	0	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	13	0.026	13	0.026	0	
TOTAL									

[16] For longline provide number of hooks, for purse seine provide number of sets.
[17] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[18] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Other albatrosses

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[19]	Total Observed Effort[1]	Observer Coverage[20]	Captures (*number*)	Capture Rate[21]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	1	0.007	1	0.007	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	30	0.133	23	0.102	3	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	178	0.362	176	0.358	0	
TOTAL									

[19] For longline provide number of hooks, for purse seine provide number of sets.
[20] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[21] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Unidentified albatrosses

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[22]	Total Observed Effort[1]	Observer Coverage[23]	Captures (*number*)	Capture Rate[24]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	0	0.000	0	0.000	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	0	0.000	0	0.000	0	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	9	0.018	9	0.018	0	
TOTAL									

[22] For longline provide number of hooks, for purse seine provide number of sets.
[23] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[24] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Other petrels

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[25]	Total Observed Effort[1]	Observer Coverage[26]	Captures (*number*)	Capture Rate[27]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	2	0.015	2	0.015	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	4	0.018	4	0.018	0	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	73	0.148	71	0.144	1	
TOTAL									

[25] For longline provide number of hooks, for purse seine provide number of sets.
[26] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[27] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Other seabirds

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[28]	Total Observed Effort[1]	Observer Coverage[29]	Captures (*number*)	Capture Rate[30]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	0	0.000	0	0.000	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	0	0.000	0	0.000	0	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	3	0.006	2	0.004	1	
TOTAL									

[28] For longline provide number of hooks, for purse seine provide number of sets.
[29] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[30] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Unidentified birds

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[31]	Total Observed Effort[1]	Observer Coverage[32]	Captures (*number*)	Capture Rate[33]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	0	0.000	0	0.000	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	0	0.000	0	0.000	0	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	20	0.041	19	0.039	0	
TOTAL									

[31] For longline provide number of hooks, for purse seine provide number of sets.
[32] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[33] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

Table 2: Continued

Country Japan Year (calendar year) 2013

Species (or group) Sea turtles

Fishery		Observed							Estimate
Stratum (*CCSBT Statistical Areas or finer scale)*	Total Effort[34]	Total Observed Effort[1]	Observer Coverage[35]	Captures (*number*)	Capture Rate[36]	Mortalities (*number*)	Mortality Rate[3]	Live releases (*number*)	Estimated total mortalities (*number*)
4	2,662,517	134,540	5.1%	0	0.000	0	0.000	0	
5	578,392	20,695	3.6%	0	0.000	0	0.000	0	
6	0	0							
7	3,215,778	226,214	7.0%	0	0.000	0	0.000	0	
8	3,544,765	250,020	7.1%	0	0.000	0	0.000	0	
9	4,513,234	492,110	10.9%	0	0.000	0	0.000	0	
TOTAL									

[34] For longline provide number of hooks, for purse seine provide number of sets.
[35] For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.
[36] For longline provide as captures per thousand hooks, for purse seine provide as captures per set.