

SC/54/ProgRep. Japan**JAPAN PROGRESS REPORT ON CETACEAN RESEARCH
June 2001 to April 2002**

(compiled by)

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This report summarizes cetacean researches conducted during the period from June 2001 to April 2002 by the National Research Institute of Far Seas Fisheries / Fisheries Research Agency (hereafter NRIFS) and the Fisheries Agency of the Ministry of Agriculture, Forestry and Fisheries, the Government of Japan (hereafter FAJ) with cooperation of other related organizations. H. Yoshida joined NRIFS on April 1, 2002.

In accordance with the statement made by the Japanese representative at the 52nd Commission meeting of IWC in June 2000 on the small cetaceans, information on small cetaceans was not included in the progress report for also this year. Thus the report covers cetacean species belong in the competence of IWC. The information on small cetaceans will be made available to interested parties through methods and by timing to be decided by the Government of Japan.

1. Species and stocks studied

Following species and stocks were studied by NRIFS and FAJ in cooperation with other organizations (excluding small cetaceans):

Common name	Scientific name	Area/stock(s)	Items referred to
Blue whale	<i>Balaenoptera musculus musculus</i>	North Pacific	2.1.1, 3.1.1
True Blue whale	<i>B. m. intermedia</i>	Southern Hemisphere,	2.1.1, 2.2, 4.1
Pygmy blue whale	<i>B. m. brevicauda</i>	Southern Hemisphere	2.1.1, 2.2, 4.1
Fin whale	<i>B. physalus</i>	Sea of Okhotsk, North Pacific, Southern Hemisphere.	2.1.1, 6.2
Sei whale	<i>B. borealis</i>	North Pacific, Southern Hemisphere	2.1.1, 6.1
Minke whale	<i>B. acutorostrata</i>	North Pacific, Sea of Japan, Sea of Okhotsk	2.1.1, 4.2, 4.4, 6.1, 6.2, 7
Common minke whale			
Antarctic minke whale	<i>B. bonaerensis</i>	Southern Hemisphere	2.1.1, 4.2, 4.4, 6.1
Bryde's whale	<i>B. edeni</i>	North Pacific, coastal waters off Kochi and off Kasasa (south west Japan), Southern Hemisphere	2.1.1, 3.1.1, 3.2, 4.1, 4.2, 4.4, 6.1, 6.2, 7

(continue)			
Humpback whale	<i>Megaptera novaeangliae</i>	North Pacific, Southern Hemisphere, Caribbean Sea	2.1.1, 4.1, 6.2, 7
Sperm whale	<i>Physeter macrocephalus</i>	North Pacific, off Ogasawara Is., South Pacific, Southern Hemisphere	2.1.1, 2.2, 4.2, 4.3, 4.4, 6.1, 6.2, 7, 8
Southern bottlenose whale	<i>Hyperoodon planifrons</i>	Southern Hemisphere	2.1.1

2. Sighting data

2.1 Field work

2.1.1 Systematic

The NRIFS and FAJ conducted a total of nine sighting and related surveys from May 2001 to March 2002 in the North Pacific and the Southern Hemisphere, in cooperation with other scientific organizations such as Institute of Cetacean Research (ICR) etc. Seven cruises were conducted in the former water and two in the latter. All of the vessels except one vessel are equipped with a top barrel. Names of the vessels, scientists on board, and period of each cruise are given in Table 1.

Table 1. Name of vessels, scientists on board for the sighting and other survey in the North Pacific and the Southern Hemisphere by the Japanese vessels from May 2001 to March 2002.

Name of vessel	Main objective	Period and region	Scientists on board*
[North Pacific]			
<i>Shonan-maru No.2</i>	Longitudinal sighting survey for Bryde's whales	July 23-Sep 20, Mid-latitudinal waters	Miyashita, T. (NRIFS; July 23 - Aug.20), Okamura, H. (NRIFS; Aug.21-Sep.20), Minamikawa, S.(NRIFS; Aug.21- Sep.20), Shikatani, T. (TS/NRIFS)
<i>Kyoshin-maru No.2</i>	Longitudinal sighting survey for Bryde's whales	July 23-Sep 20, Mid-latitudinal waters	Noji, S.(TS/NRIFS) and Sato, H. (TS/NRIFS)
<i>Kurosaki</i>	Sighting of minke and Baird's beaked whale	July 23 – Sep. 5, Off the Pacific coast of the northern Japan	Saito, T.(TS/NRIFS), Hayashi, T. (TS/NRIFS), Okumura, T.(NRIFS), Tanaka, Y. (TS/NRIFS)
<i>Kyo-maru No.1</i>	Sighting of Bryde's whales	Aug. 18- Sep.19, Western North Pacific	Shimada, H. (NRIFS) Hirano, J.(TS/NRIFS), I.L. Bamy and M. Camara (Guinea)
<i>Rosa Rugosa</i>	Sighting survey	Aug. 29-Sep. 6, Coastal waters of southern part of the Kuril Islands	Kato, H.(NRIFS), Yoshida, H. (ICR), Fujikawa E. (Hokkaido Univ.; HU), Morino, K (TS/HU), Okumura, T. (TS/HU)

<i>Kurosaki</i>	Biopsy and marking for dolphins	Nov. 1-30, Off the Pacific coast of Japan	Saito, T.(TS/NRIFS), Sato, H.(TS/NRIFS), Tanaka, Y.(TS/NRIFS) and Ryono, A.(TS/NRIFS)
<i>Kanou-maru</i>	Sighting and acoustic survey	Jan.18-Mar.18, 2002 Lower latitudinal waters in the western North Pacific	Shimada, H. (NRIFS; Feb 22 - Mar.18), Noji, S. (TS/NRIFS), Okumura, T. (TS/NRIFS), Endo, K. (TS/NRIFS)
[Southern Hemisphere]			
<i>Shonan-maru</i>	Sighting SOWER/Blue & Antarctic	Dec.20-Feb.18, 2002 Area V-west (130-165E)	Ensor, P. (New Zealand), Kariya, T.(Japan), Olson, P. (USA), Rankin, S. (USA)
<i>Shonan-maru No.2</i>	Sighting SOWER/Blue & Antarctic	Dec.20-Feb.18, 2002 Area V-west (130-165E)	Sekiguchi, K. (Japan), Cotton, J.(USA), Hucke-Gaete, R.(Chile), Ljungblad, D.(USA)
*) abbreviation cite text. TS; temporary technical staff.			

The IWC/SOWER Antarctic sighting cruise was conducted under auspices of the IWC/SOWER (Southern Ocean Whale and Ecosystem Research) program from 20 December 2001 to 18 February 2002. This cruise consisted of the blue whale research component and the minke whale assessment component. The main purpose of the blue whale component was to obtain scientific information relevant to developing shipboard identification methods for separating “true” blue whales (*Balaenoptera musculus intermedia*) from “pygmy” blue whales (*B. m. breviceauda*). For this purpose, acoustic survey, biopsy skin sampling, digital video taking and photo-identification were prepared in addition to sighting survey. The government of Japan offered two research vessels (*Shonan-maru* and *Shonan-maru #2*) and crew for this program, as has been in the case for the last 24 years. H. Kato (NRIFS) acted as an organizer of the cruise and as a member of the steering group of the program. Weather conditions were extremely poor. Though a research area planned in Area VW (130°-165°E) for 47 days, the survey was covered only longitudinally 20° (130°-150°E). 14 sightings (35 animals) of blue whale were encountered during the survey. P. Ensor (New Zealand) acted as a cruise leader. K. Sekiguchi (Japan) participated in the cruise as a senior scientist, Cotton (USA), Hucke-Gaete (Chile), Kariya (Japan), Ljungblad (USA), Olsen (USA) and Rankin (USA) as researchers. The details of the cruise and results will be separately reported at the 54th IWC/SC meeting.

In the North Pacific, a total of seven cruises, six cruises were mainly engaged in sighting survey with biopsy skin sampling at an opportunistic base. T. Miyashita (NRIFS) and Shimada worked in planning, track designs, and searching methods of all the above cruises. Total searching distances made during the cruises were 3,406 n. miles, 10,591 n.miles. and 2,814 n.miles for the Southern Hemisphere, the North Pacific in summer and the North Pacific from autumn to winter, respectively. During these cruises, Bryde's whale sighting survey was leaded and oversighted by H. Shimada (NRIFS, SC/54/RMP13). I.L. Bamy and M. Camara (Guinea) participated to learn the cetacean sighting survey method during the first half, from 10 August to 31 August. Additional sighting survey to examine the longitudinal distribution of Bryde's whales was conducted using two

research vessels (SC/54/RMP10). In addition, systematic sighting data were also obtained during the biopsy and marking survey.

Miyashita took part in the Korean sighting survey in the Yellow Sea in September 2001 for oversight task requested from the IWC/SC. The survey was conducted using *R/V Tamgu 3* to get the information on the distribution and density of common minke whales.

Under the cooperation among the NRIFS, Kochi prefecture government (KPG) and the Whale Watching Association in Tosa Bay (WATB), the sighting surveys on Bryde's whales were conducted in the coastal waters off Kochi in July and September 2001, using 24 whale watching boats that belong to the WATB. The survey lasted 12 days and T. Kishiro (NRIFS), 3 research assistants (Kagoshima University, Hokkaido University and Kochi University) and the total of 28 members of WATB acted as the researchers on board. A total of 31 schools (57 individuals) of Bryde's whales were detected during the survey.

The sighting surveys on Bryde's whales were also conducted in the coastal waters off Kasasa, Southwest end of Kyushu, in June and August 2001, under the cooperation among the NRIFS, Kagoshima prefecture government (KAPG), and Nomaie Fishery Cooperative Union (NFCU). A total of 31 whale watching boats (belong to the NFCU) was used as the research vessels. The surveys lasted 10 days. Kishiro and 15 research assistants (Kagoshima University) acted as the researchers on board. A total of 16 schools (22 individuals) of Bryde's whales were detected during the surveys.

In order to obtain distributional information of cetaceans in the coastal waters of southern part of the Kuril Islands, a sighting survey was conducted from 29 August to 6 September 2001, using the research vessel *Rosa Rugosa* (478GT). Kato joined the survey as the cruise reader and H. Yoshida (ICR) also participated as the senior researcher. The survey constitutes one part of the Russian – Japan Academic exchange Program without Visa in the most southern parts of Kuril Island, and conducted by co-sponsorship of ICR, Hokkaido University and Japan Foundation. A total of 509.3 n.miles was searched and 283 schools of cetaceans, including 29 common minke, 22 sperm, and 1 humpback whale schools were seen.

The results of the sightings of large cetaceans from the offshore sighting cruises are given in Tables 2, 3 (surveys in summer season) and 4 (in winter season).

The ICR and NRIFS conducted sighting surveys with Caribbean scientists in coastal waters of the Caribbean countries, in order to obtain further information on distribution of cetaceans, especially humpback whales and sperm whales. H. Yoshida (ICR) joined pre-survey meetings held in Dominica and St. Lucia and then conducted the sighting survey in coastal waters of St. Vincent and the Grenadines and Grenada in the period of 19-23 March 2002, with scientists of St. Vincent and the Grenadines and Grenada. Unfortunately, weather condition was not so good and no sightings of large cetaceans were collected during the survey with 104.5 nautical miles of primary searching. These sightings were not included in Tables 2 – 4. It is expected cruise reports will be submitted by respective countries through appropriate way.

2.1.2 Opportunistic, platforms of opportunity

Opportunistic sighting data have been collected during operations by the small type whaling and by dolphin fisheries.

Under the cooperation among NRIFS, Nomaie Fishery Cooperative Union (NFCU) and Faculty of Fisheries, Kagoshima University, opportunistic sighting data of Bryde's whales as well as associated wildlife data have been collected during the whale watching operations in the coastal waters off Kasasa, southwest end of Kyushu.

2.2 Analyses/development of techniques

Kato, Y. Honno (Hokkaido University), H. Yoshida (NRIFS) and their co-workers conducted further analyses on ID-keys to discriminate sub-species of blue whales from the shipboard survey, using photographs and video sequence of whales obtained through the Japan/IWC blue whale cruise in 1995/96-98/99 and 2000/01 IWC/SOWER blue whale cruises and using impression on body shape pattern reported by topmen in 1996/97, 98/99 and 2000/01 IWC/SOWER blue whale cruises (SC/54/IA8). In addition, they also used some photographs taken in JARPA operation. It was again identified that there is statistically significant trend that the pygmy submerges with showing dorsal fin and keel ($P<0.05$). Relative body proportion and external morphology of blowhole have much clear indication of the sub-species discrimination. Through the present and past analyses, it is identified that “*Tadpole shape*” is peculiar to the pygmy and “*Torpedo shape*” to the true blue whales ($P<0.05$); the *type A* blowhole that anterior tip of the central groove beyond the anterior tip of nostrils is peculiar to the pygmy ($P<0.05$). Furthermore, there is distinctive difference in the dorsal surface type between the two sub-species as that type 1 and 3 are for pygmy and type 4 for true ($P<0.05$). The Bayesian analysis indicates combination of these keys provides reliable discrimination for the sub-species as suggested by higher posterior probability (0.921-0.996). The present study also preliminarily examines genetic comparison of the keys by mt DNA, there are some differences in *haplotype* frequency between the sub-species, but difficult to find specific *haplotype* peculiar to the respective sub-species

Okamura and co-workers developed a new variant of hazard probability model. It is more general than other hazard probability models, and extended to include sighting data of partial observers. Simulation results showed that a new model could give a reasonable abundance estimate in comparison with other hazard probability model.

Shimada and J. Takei (University of Nihon) developed photogrammetric system for measurement of whale body length using laser device, digital angle meter and digital camera. After experiments to calibrate its accuracy using some targets known length, they tried to estimate length of sperm whales from top barrel on *Shunyo-maru* in the waters off eastern Japan.

Shimada and H. Murase (ICR) analyzed relationship between distribution of minke whales and Antarctic sea ice coverage in the austral summer using metrological satellite data for 2nd and 3rd IDCR/SOWER circumpolar survey in Area IV (SC/54/IA18). The number and school size of minke whales was small in 1998/99 compared with 1988/89. The ice edge location, the continental sloop covered by pack ice and the monthly sea surface temperatures might explain the reason for changes in minke whale distribution pattern in Area IV. The total area of pack ice in Area IV had changed 65% in maximum for 21 years. Shimada, Segawa and Murase examined abundance of minke whales within pack ice region where was un-survey area incorporating sea ice concentration data with the previous estimation of IDCR/SOWER. Preliminary trial revealed total abundance of Antarctic minke whales for 2nd and 3rd circumpolar survey in the pack ice region was estimated under three scenarios. They thought large proportion of minke whales (18% to 150% of minke whales in waters north of the ice-edge line) penetrated into the pack ice region (SC/54/IA19).

Minamikawa, Okamura and Miyashita analyzed JSV (Japanese Scouting Vessels) data to examine the migration pattern and the extrapolation rate to the lower latitudinal waters from the IDCR abundance estimate using the generalized linear models. They suggested that migration peak in the waters south of 60°S is in January in 1970's but in the middle of February in 1990's, and the extrapolation rate to the area between 30°S to 60°S was estimated as 6-16% of those south of 60°S (SC/54/IA12).

3. Marking data

3.1 Field work

3.1.1 Natural marking data

Many photographs were taken through the dedicated sighting cruises above-mentioned and these were preserved for future analysis.

Photographs were also collected from local sighting cruises for the coastal Bryde's whales off Kochi and Kasasa. A cumulative total of 43 Bryde's whales (Kochi) and 36 Bryde's whales (Kasasa) have been individually identified by mainly shape of dorsal fin, which has been deposited in NRIFS under the cooperative program. Kishiro and co-workers started to examine these data with respect to the relationship between areas and re-sighting.

One blue whale was photo-identified using the dorsal pigmentation pattern during the longitudinal sighting survey by *Shonan-maru* # 2 during 2001 summer sighting survey in the North Pacific.

3.1.2 Artificial marking

Minamikawa and Iwasaki started the development of attachment system of satellite tags on the large cetaceans. They concluded that crossbow or long rod would be suitable for attaching tool. However, it is still unsolved how to approach adequately to the large cetaceans.

3. 2 Analyses/development of techniques

Kishiro and K. Ohata (Kasasa Ebisu Maritime Museum, Kagoshima) further examined the natural marking data (photographs of dorsal fin) of the coastal Bryde's whales off Kasasa deposited in 1998 to 2001, and confirmed that one animal individually identified in August 1998 were re-sighted in August 1999, September 2000 and August 2001 in almost the same location off Kasasa.

4. Tissue/biological samples collected

4.1 Biopsy samples

Biopsy skin sampling was tried at an opportunistic base during the sighting survey cruises in the North Pacific and the Southern Hemisphere as mentioned in Section 2.1.1. Furthermore, one biopsy/marketing cruise was conducted, in which T. Saito (Temporary technical staff (TS)/ NRIFS) H. Sato (TS/NRIFS), Y. Tanaka (TS/NRIFS) and A. Ryono (TS/NRIFS) were on board *Kurosaki* sailing off the Pacific coast of the Main Island of Japan during 1-30 November 2001 (the ship also conducted line transect sighting survey along the predetermined track line). All of biopsy samples collected during the cruises are listed in Table 5.

4.2 Samples from direct catches or bycatch

As detailed in Table 7, under the scientific permits, 440 minke whales were taken in the Antarctic (under the 2001/02 JARPA program) and 100 minke whales, 50 Bryde's whales and 8 sperm whales in the western North Pacific (under the 2001/2002 JARPN II program) respectively. Extensive biological materials were collected from the sampled whales. Details of such materials are described in the cruise reports (SC/54/O16, SC/54/O17) and the progress report of the ICR, Tokyo (SC/54/O19).

The two-year feasibility study of JARPN II was completed successfully. One of the main objectives was to estimate the prey preference of cetaceans. S. Kawahara (NRIFS) acted as one of seniors for the planning of the project. As in 2000 the concurrent whale and prey surveys were conducted off the Pacific coast of the northern Japan with four vessels for whale and two vessels for prey surveys, respectively. The surveys consisted of two terms, the first from 16 May to 24 June and the second from 7 to 12 July. The biomass of each prey species was estimated in seven small

blocks set in the research area with acoustic devices (EK-600) on board *Kyoshin Maru #2* and the species composition from the catches taken by *Torishima*, a stern trawler. Also oceanographic data were collected with CTD on board *Torishima*. Kawahara and H. Watanabe (NRIFS, Oceanic squid section) organized the prey survey. Watanabe and M. Takada (TS/NRIFS) acted as the researchers on board *Torishima*. The data are being analyzed now and a preliminary estimation was made for the prey preference of minke and Bryde's whales. *Torishima* made experimental trawlings for deep-sea squids from 26 June to 5 July at depths between 0 to 530 m. Although the average catch of squid per hour was 112 kg, the catchability for larger squids seems to be low especially in the meso-pelagic layer deeper than 200m. This was probably caused by the small mouth opening of the net and low towing speed (2-3 knots).

4.3 Samples from stranded animals

Several tissues of stranded minke whales and other whales were collected by ICR and the details are given in the ICR progress report (SC/54/O19).

The 14 sperm whales were live mass-stranded at Ohura, Kagoshima prefecture in January 2002. Under the great efforts of Ohura town office, one animal was successfully released in the coastal waters off Ohura, while the remaining 13 animals died on the beach. One animal buried underground and rest of them laid on the bottom of the sea with concrete blocks. Kato contributed Ohura town office as an adviser for disposition of the carcasses and organized the field data collection. Kato, Kishiro, T. Bando (ICR) and several researchers (Kagoshima University and Kagoshima Aquarium), collected biological samples from 12 whales, for life history, genetic and pollution studies. T. Yamada (National Science Museum) and their colleagues also collected some biological samples from one buried whale.

Kato, Kishiro, Bando (ICR), Yoshida and K. Ohata (Kasasa Marine Museum, Kagoshima) started to examine the school composition of sperm whales using samples collected from mass-stranded whales at Ohura, Kagoshima prefecture in January 2002. They examined unerupted maxillary teeth and tentatively aged 12 animals. Genetic analysis has been on going.

4.4 Analyses/development of techniques

Kato, in cooperation with R. Zenitani (ICR), examined earplugs and gonads for 40 and 100 minke whales collected in 2000 and 2001 JARPN II operations respectively; for 43 and 50 Bryde's whales in 2000 and 2001 JARPN II operations respectively. In addition, Kato and Zenitani also examined gonads for total of 13 sperm whales collected in 2000 and 2001 JARPN II operations.

Band and Kishiro, under guidance of S. Ohsumi (ICR), examined un-erupted maxillary teeth of 13 sperm whales collected in the 2000 and 2001 JARPN II operations.

T. Tamura (ICR), Ohizumi, and T. Kubodera (National Science Museum) partly analyzed stomach contents of 8 sperm whales collected in the sampling survey of JARPN II, 2001. Most of the prey items were meso-pelagic or deep sea squids.

Preliminary analysis of prey preference of minke and Bryde's whales in the western North Pacific was made using 2000 and 2001 JAPRN II feasibility study data. The prey preference can be calculated by comparing the diet composition of cetaceans and the prey composition in the sea. The main prey species of minke and Bryde's whales were Japanese anchovy, walleye Pollock and krill. Cheeson's index was used to assess the prey preference of cetaceans. Preliminary results suggested that minke whale preferred to Japanese anchovy while they seemed to avoid krill. Preference to pelagic shoaling fish was similar to that in the eastern North Atlantic. Bryde's whale also preferred to Japanese anchovy in August in 2000 but such a preference could not be detected from May to July in 2001 when most of Japanese anchovy were larva in the distribution area of Bryde's whale.

Though the results is preliminary, it is considered that the concurrent whale and prey surveys applied in the JARPN II feasibility survey could provide prey preference of cetaceans.

5. Pollution studies

ICR conducted further pollution study under the leadership of Y. Fujise (ICR), and results are summarized in SC/54/O19.

6. Statistics for large cetaceans

6.1 Direct catches

The government of Japan issued the Institute of Cetacean Research, Tokyo (ICR) permits to take Southern Hemisphere minke whales of no more than 440 individuals for 2001/02 JARPA. (Research take in the Antarctic). In addition, the government also issued the sampling limits of 100 minke whales, 50 Bryde's whales and 10 sperm whales in the North Pacific for research purpose under the 2001 JARPN II (Research take in North Pacific, Phase II).

Under the scientific permits, 440 minke whales were taken in the Antarctic (under JARPA program) and 100 minke whales, 50 Bryde's whales and eight sperm whales in the western North Pacific (under JARPN II program), respectively (Table 7). During the JARPN II operation, one sei whale was erroneously caught. Extensive biological materials were collected from the sampled whales. Details of such materials are described in the cruise reports (SC/54/O16, SC/54/O17) and the progress report of the ICR (SC/54/O19).

6.2 Other non-natural mortality for the calendar year 2001

All of information relevant to this item is given in Tables 8 and 9.

7. Stranding

Information of stranded cetaceans has been officially collected by the Far Seas Fisheries Division of the FAJ, 1-2-1, Kasumigaseki, Tokyo 100, Japan. The information is summarized in Tables 9 and 10. NRIFS assisted FAJ to compiling the data and necessary sampling.

In addition, the Institute of Cetacean Research, Tokyo Suisan Building, 4-18 Toyomi, Chuo-ku, Tokyo 104, Japan and T. Yamada (National Science Museum; Hyakunin-cho, Shinjuku-ku, Tokyo 164, Japan) voluntarily collected relevant information of the stranding.

8. Other studies and analyses

Okamura and coworkers developed a method to examine prey preference of animals using the Bradley-Terry model with a normal distribution for paired comparison data. The method can treat quantitative data, although usual Bradley-Terry model can only treat qualitative data. The result applied to a captive pinnipeds in an aquarium showed that the pinniped had significant prey preference.

NRIFS made a new research vessel, *Shunyo-maru* (887GT) who has a top barrel and acoustic equipments for cetacean survey. Shimada and Takei conducted a tentative cruise to detect locations and estimated body length of sperm whales under water using a passive sonar and hydrophone system on *Shunyo-maru*.

Kawahara, Okamura and their co-workers examined how the *Multspec* and *Ecosim* model

performed for the test data. They concluded that they would be promising for the future multi-species management.

9. Publications (excluding IWC volumes and documents submitted to the IWC meetings)

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- Iwasaki, T., Kishiro, T. and Kato, H. 2001 Small cetacean resources management in Japan. *Aquabiology* 23 (3) :254-263 (In Japanese with English summary)
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- Iwasaki, T., Kai, T., Tanakura, H. and Kato, H. 2001 Satellite tracking of two bottlenose dolphins driven to Taiji, Japan. Abstract . 14th Biennial Conference on the Biology of Marine Mammals. p106 2001 November, Vancouver
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- Iwasaki, T. 2002 Dall's porpoise. p52-53. In: Current status of the international fishery resources, 75pp, Fisheries Agency of Japan and Fisheries Research Agency of Japan. (in Japanese)
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- Kato, H., Tamura, T. 2001 Preliminary Considerations on Potential Competition between Southern blue-fin Tuna and Marine Mammals, especially Cetaceans CCSBT4th ERSCSBT-ERS/0111/71 8pp 2001 November Tokyo
- Kato, H. and Ohsumi, S. (eds.). 2002. *Towards the sustainable use of cetacean stock – the fore front of cetacean stock studies*. Seibutukenkyu-sha, Tokyo, 216pp. (in Japanese)
- Kato, H. and Yoshida, H. 2002. Cetaceans around the Iturup Island, southern Kurile Islands. Extend abstract. Symposium on Nature and Conseravation of the Southern Kuril Islands (The northern Four Islands). Hokkaido Prefectural Culture Exchnage Center. Nemuro. March 9th 2002. (in Japanese).
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Table 2. Large cetaceans sighted by Japanese dedicated sighting surveys (*Shonan-maru* and *Shonan-maru No.2*) in the Southern Hemisphere in the 2001/2002 austral summer season (including SOWER/Blue whale cruises, SOWER/Antarctic cruises and those before and after the cruises). The number is given by 100 square based on the noon position of vessels. Species code: B = blue, F = fin, H = humpback, Se = sei, MiA=Antarctic minke, Sp = sperm, Bo = southern bottlenose whale

100K square	Distance (n.miles)	Number of whales sighted						
		B	F	H	Se	MiA	Sp	Bo
A 20	345	-	-	-	-	8	-	7
21	282	-	1	-	-	-	1	-
B 20	1,407	20	20	24	-	198	8	28
21	1,062	15	18	17	-	86	-	2
22	22	-	-	3	-	75	-	-
D 21	288	-	-	-	7	-	1	-
Total	3,406	35	39	44	7	367	10	37

Table 3. Large cetacean sighted by Japanese dedicated surveys (*Kyoshin-maru No.2*, *Shonan-maru No.2*, *Kyo-maru No.1* and *Kurosaki*) operated in the North Pacific during 2001 summer season (April to September 2001) in addition three local sighting surveys off Kochi, Kagoshima and the southern Kuril Islands in June to September. The number is given by 100 square based on the noon position of the vessels. Species code: Br = Bryde's whale, MiC: common minke for others see Table 2.

100K square	Distance (n.miles)	Number of whales sighted						
		B	F	H	Br	Se	MiC	Sp
K 20	1,281	-	-	-	2	-	-	2
L 20	979	-	-	-	-	-	-	20
27	101	-	-	-	-	-	-	-
M 19	236	-	-	-	-	-	2	-
20	1,763	-	-	-	75	-	1	5
21	1,957	-	-	-	3	-	9	67
22	793	-	-	-	11	-	-	97
23	855	-	-	-	30	8	-	22
24	682	-	-	-	97	3	-	28
25	700	-	-	-	23	-	-	7
26	1,045	1	-	-	10	-	-	77
27	174	-	-	-	-	-	-	8
N 21	515	-	-	2	-	-	39	24
22	19	-	1	-	-	1	-	1
	11,100	1	1	2	251	12	51	358

Table 4. Large cetacean sighted by Japanese dedicated sighting surveys (*Kurosaki*, *Kano-maru* and transit cruises of the SOWER by *Shonan-maru* and *Shonan-maru No.2*) in the North Pacific in 2001/20002 autumn-winter season(October 2001- March 2002) . For species code see Tables 2 and 3.

10°K square	Distance (n.miles)	Number of whales sighted		
		Br	H	Sp
J 23	245	9	-	-
24	108	-	-	8
K 21	10	-	-	-
22	102	2	-	-
23	131	4	-	-
24	9	-	-	-
L 19	47	-	-	2
20	362	-	-	5
21	35	-	-	-
22	412	3	-	-
M 21	1,353	-	1	62
Total	2,814	18	1	77

Table 5. Large cetacean biopsy samples collected through Japanese research, June 2001 - April 2002. In addition, some samples were obtained through JARPA and JARPN as referred in 54/SC/O19.

Species	Area	No. collected	Archived (Y/N)	No. analyzed	Total holdings	Contact Institute
Blue whale	Antarctic	15	Y	0	15	NRIFS
Humpback whale	Antarctic	1	Y	0	1	NRIFS
Bryde's whale	N. Pacific	1	Y	0	1	NRIFS

Table 6. Large cetacean samples from bycatch, June 2001-April 2002. In addition, some samples were collected by ICR as referred in SC/54/O19.

Species	Area	Type of fishery	No. collected	Archived (Y/N)	Tissue type(s)	Contact Institute
Minke whale	N. Pacific	Trap net	1	Y	Skin and muscle	NRIFS

Table 7. Direct catch of large cetaceans by Japan, May 2001-April 2002.

Species	Type of catch	Area/stock	Male	Female	Total holdings
Minke whale	Special permit	N. Pacific	93	7	100
	Special permit	Antarctic	201	239	440
Sei whale	_* ¹⁾	N. Pacific	1	0	1
Bryde's whale	Special permit	N. Pacific	17	33	50
Sperm whale	Special permit	N. Pacific	2	6	8

1) erroneous catch, See SC/54/O16;

Table 8. Other non-natural mortality of large cetaceans (bycatch) by Japanese fisheries, by Prefecture in January-December 2001. Species and figures are based on reports of prefecture governments to the Fisheries Agency which are reports from individual fishermen or fishery cooperative unions (provisional figures).

Species	Prefecture ¹⁾	Type of fishery	No. of individuals
Minke whale	Hokkaido	Trap net	9
	Aomori	Trap net	2
	Iwate	Trap net	4
	Miyagi	Trap net	4
	Niigata	Trap net	5
	Toyama	Trap net	7
	Ishikawa	Trap net	25
	Fukui	Trap net	3
	Kyoto	Trap net	2
	Chiba	Trap net	2
	Kanagawa	Trap net	1
	Shizuoka	Trap net	1
	Mie	Trap net	1
	Wakayama	Trap net	5
	Yamaguchi	Trap net	1
	Kochi	Trap net	2
	Nagasaki	Trap net	4
	Miyazaki	Trap net	1
	Total		79
Fin whale	Hyogo	Other coastal fishery	1
Unidentified balaenopterid	Mie	Trap net	1
Total			81

1) Recorded to the place where mortality occurred.

2) Besides above records two humpback whales were taken by trap nets (one in Nagasaki and one in Okinawa, respectively), but later released alive.

Table 9. Summary of large cetacean bycatch and strandings in January – December 2001, by species and type of fisheries. For further details see Tables 8 and 10. [I]= incidental take. (provisional figures).

Species	Trap net	Other coastal fisheries	Strandings	Total
	[I]	[I]	[I]	
Bryde's whale	0	0	1	1
Minke whale	79	0	10	89
Fin whale	0	1	0	1
Humpback whale	0	0	1	1
Sperm whale	0	0	3	3
Unidentified balaenopterid	1	0	3	4
Total	80	1	18	99

Table 10. Large cetacean strandings in Japan, January-December 2001. Species and figures are based on reports of prefecture governments to the Fisheries Agency which are reports from individual fishermen, fishery cooperative unions or the general public (provisional figures).

Species	Prefecture ¹⁾	No. of Individuals
Minke whale	Hokkaido	5
	Aomori	1
	Iwate	2
	Yamagata	1
	Kochi	1
	Total	10
Bryde's whale	Hyogo	1
Humpback whale	Okinawa	1
Sperm whale	Hokkaido	1
	Chiba	1
	Miyazaki	1
	Total	3
Unidentified balaenopterid	Niigata	2
	Yamaguchi	1
	Total	3
Total		18

Recorded to the place where strandings occurred.