

Japan. Progress report on cetacean research, April 2009 to March 2010, with statistical data for the *calendar year* 2009 or the season 2009/10

COMPILED BY TOMIO MIYASHITA¹, LUIS A. PASTENE² AND HIDEHIRO KATO³

1: National Research Institute of Far Seas Fisheries, 2-12-4 Fukuura, Kanazawa-ku, Yokohama, Kanagawa 236-8648, Japan

2: Institute of Cetacean Research, 4-5 Toyomi-cho, Chuo-ku, Tokyo 104-0055, Japan

3: Tokyo University of Marine Science and Technology, 4-5-7 Konan, Minato-Ku, Tokyo 108-8477, Japan

This report summarises information obtained from:

Name of agency/institute	Abbreviation (used in rest of report)	Contact e-mail address
National Research Institute of Far Seas Fisheries	NRIFSF	miyachan@fra.affreco.jp
Institute of Cetacean Research	ICR	pastene@cetacean.jp
Tokyo University of Marine Science and Technology	TUMST	katohide@kaiyodai.ac.jp

NATIONAL RESEARCH INSTITUTE OF FAR SEAS FISHERIES (NRIFSF)

1. SPECIES AND STOCKS STUDIED

IWC Common name	Scientific name	Area/stock(s)	Items referred to
Blue whale	<i>Balaenoptera musculus</i>	Southern Hemisphere, North Pacific	2.1.1
Fin whale	<i>B. physalus</i>	North Pacific, Southern Hemisphere.	2.1.1; 4.2; 6.2; 8
Sei whale	<i>B. borealis</i>	North Pacific, Southern Hemisphere	4.2; 6.2; 8
Common minke whale	<i>B. acutorostrata</i>	North Pacific, Sea of Japan	2.1.1; 4.1; 4.2; 6.2; 6.3.2; 8
Antarctic minke whale	<i>B. bonaerensis</i>	Southern Hemisphere	6.2
Bryde's whale	<i>B. edeni</i>	North Pacific, coastal waters off Kochi	2.1.1; 3.1.1; 3.2; 6.2
Humpback whale	<i>Megaptera novaeangliae</i>	North Pacific, Southern Hemisphere	2.1.1; 4.1; 4.2; 6.3.2; 8
North Pacific right whale	<i>Eubalaena japonica</i>	North Pacific	2.1.1; 3.1.1; 3.2; 8
Southern right whale	<i>E. australis</i>	Southern hemisphere	4.1
Sperm whale	<i>Physeter macrocephalus</i>	North Pacific, South Pacific, North Atlantic off Africa, Southern Hemisphere	2.1.1; 6.2; 8

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

The NRIFSF and Fisheries Agency of the Government of Japan (FAJ) conducted a total of five dedicated shipboard sighting surveys using research vessels in the North Pacific. All of the vessels are equipped with a top barrel.

The IWC/SOWER (Southern Ocean Whale and Ecosystem Research) Antarctic sighting cruise was conducted in a part of Area IV from 7 January 2009 to 7 February 2010. The Government of Japan offered a research vessel (*Kaiko-maru*). The main objectives were to: 1) undertake a sighting survey in collaboration with an Australian

Antarctic Division aerial survey designed to investigate and compare minke whale densities from within the pack ice and from the ice-free water north of the pack ice, and; 2) continue research on the priority species southern right, blue, fin, and humpback (biopsy sampling and photo-identification as well as identification of sub-species for blue whales). Research was conducted in the Antarctic waters from 100° E to 115° E for 32 days. Keiko Sekiguchi (cruise leader, USA), Kazuki Fukutome (Japan), Laura Morse (USA), and Cornelia Oedekoven (UK) participated in the survey as scientists. The details of the cruise and results are reported as Document SC/62/IA1.

During the sighting surveys in the North Pacific, the following provisional numbers of sightings of large cetaceans were obtained:

Target species	Date	Area	No. of sightings	Contact person/institute and references
North Pacific right whale	18/07-31/08/09	Okhotsk Sea	17	H.Yoshida
Humpback whale	6/06-15/07/09	Western North Pacific	1	T. Kishiro
	3/09-17/09/09	Okhotsk Sea	2	T. Kishiro
Fin whale	18/07-34/08/09	Okhotsk Sea	73	T. Miyashita
Bryde's whale	6/06-15/07/09	Western North Pacific	3	T. Kishiro
Common minke whale	6/06-15/07/09	Western North Pacific	4	T. Kishiro
	18/07-31/08/09	Okhotsk Sea	46	H.Yoshida
	03/09-17/09/09	Okhotsk Sea	8	T. Kishiro
	9/07-17/08/09	Sea of Japan	2	T. Iwasaki
Sperm whale	6/06-15/07/09	Western North Pacific	82	T. Kishiro
	18/07-31/08/09	Okhotsk Sea	2	H.Yoshida
	03/09-17/09/09	Okhotsk Sea	15	T. Kishiro
	20/08-28/09/09	Western North Pacific	3	T. Iwasaki

In cooperation with Kochi Prefecture Government and the Whale Watching Association in Tosa Bay (WATB), the NRIFSF conducted a sighting surveys on Bryde's whales in the coastal waters off Kochi in July and August 2009, using a total of 24 whale watching boats belong to the WATB. The survey lasted 12 days in July and August, and T. Kishiro (NRIFSF), six research assistants and 24 fishermen members of WATB acted as the researchers on board. A total of 5 schools (8 individuals) of Bryde's whales were sighted in July and 19 schools (26 individuals) in August.

2.1.2 Opportunistic, platforms of opportunity

Opportunistic sighting data have been collected during operations of the Small Type Whaling and dolphin fisheries. The results will be released on the website of FAJ/MAFF/GJPN.

2.2 Analyses/development of techniques

Okamura (NRIFSF) and Kitakado (TUMST) have conducted simulation tests using the newly developed abundance estimation model and applied the model to the real IDCR/SOWER data (SC/62/IA3).

3. MARKING DATA

3.1 Field work

3.1.1 Natural marking data

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Bryde's whale	Dorsal fin	Kochi/ East China Sea stock and Kagoshima/ East China Sea Stock	2 (Kochi), and 0 (Kagoshima)	Y	55 (Kochi), and 25 (Kagoshima)	T, Kishiro/NRIFSF
North Pacific right whale	Callosities and lip patches	Okhotsk Sea	22	N	0	H.Yoshida/NRIFSF

3.1.2. Artificial marking data

None.

3.1.3 Telemetry data

None.

3.2 Analyses/development of techniques

Natural marking data were collected from local sighting cruises for the coastal Bryde's whales off Kochi and Kasasa. A cumulative total of 55 Bryde's whales (Kochi) and 25 Bryde's whales (Kasasa) have been individually identified mainly by the shape of dorsal fin. Photographs have been deposited in the NRIFSF. Kishiro and co-workers are examining these photographs to study the movements of coastal Bryde's whales.

During the common minke whale biopsy sampling survey conducted in the Okhotsk Sea in summer 2009, 22 North Pacific right whales were photographed; examination of digital images of their head (callosities and lip patches) indicated no re-sightings.

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1 Biopsy samples (summary only)

Species	Area/stock	Calendar year/ season no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Humpback whale	Antarctic	2009/10 21	Y	0	21	NRIFSF
Southern right whale	Antarctic	2009/10 26	Y	0	26	NRIFSF

Skin biopsy sampling was conducted during the IWC/SOWER sighting survey cruise in the Southern Hemisphere and the common minke whale biopsy sampling survey cruise in the Okhotsk Sea as mentioned in Section 2.1.1.

4.2 Samples from directed catches (commercial, aboriginal and scientific permits) or bycatches

From 5 September to 17 October 2009, the JARPN II coastal component was conducted off Kushiro, Hokkaido, northeastern Japan, using four small-type whaling catcher boats. Kato (TUMST), Kishiro(cruise leader, NRIFSF), Yoshida, Iwasaki, Kanaji (NRIFSF), Minamikawa(NRIFSF), Yasunaga(ICR), Oikawa (ICR), Otani(ICR), Ishikawa(ICR) and Kanda(ICR) conducted the survey. Sampling was carried out in the coastal waters within 50 nautical miles from Kushiro, and all the animals collected were landed at the Kushiro port for biological examination. A total of 5,136.2 n. miles (493.8 hours) was searched, and 106 schools (107 individuals) of common minke whales, 20 schools (51 individuals) of fin whales, 19 schools (22 individuals) of humpback whales, and two schools (five individuals) of sei whales were detected. Of these, 59 common minke whales (36 males and 23 females) were collected. Further information can be found in SC/62/OX and the part of ICR in this report.

In 2009, NRIFSF conducted whale prey species surveys in the transition regions of the western North Pacific enclosed by latitude from 39°N to 40°N and longitude from 156°E and 149°E for sei whales *Balaenoptera borealis* and latitude from 43°N to 44°N, and longitude from 154°E and 157°E excluding Russian EEZ for common minke whale *B. acutorostrata* from 10 to 22 July 2009 by the trawler-type research vessels, Shunyo Maru (887 GT: NRIFSF). The objective of this survey was to examine habitat and prey preferences of these whales in relation to prey and oceanographic environment in cooperation with the sampling survey of the whale by *Nisshin-Maru* and two sighting/sampling vessels conducted by ICR. Watanabe and Fujiwara (NRIFSF) joined this survey. The distribution, abundance, and size composition of the prey species were investigated with the midwater trawl, MOCNESS (Multiple Opening/Closing Net and Environment Sampling System), Twin NORPAC net (North Pacific Standard net), and quantitative echosounder in the daylight period. A conductivity-Temperature-Depth (CTD) profiler cast was made down to 500 m depth at each sampling station to determine the oceanographic condition. A total of 15 times of trawl samplings, two times of MOCNESS samplings, and 16 times of NORPAC net samplings and CTD casts were conducted. The result suggests that the both sei and common minke whales preferred prey rich environment in or close to the subarctic boundary and subarctic front, respectively, as their main habitat. Both whales seemed to prefer Japanese anchovy *Engraulus japonicus* and/or Pacific saury *Cololabis saira* whereas they seemed to avoid euphausiids. These results also suggest that distributions of small epipelagic fish prey and/or oceanographic conditions greatly affect to the distribution of these whales during their summertime feeding migration period. Further details are given in Appendix 2 of the SC/62/O4.

4.3 Samples from stranded animals

See the part of ICR in this report.

4.4 Analyses/development of techniques

None.

5. POLLUTION STUDIES

See the part of ICR in this report.

6. STATISTICS FOR LARGE CETACEANS

6.1 Corrections to earlier years' statistics for large whales

None.

6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 2009 or the season 2009/10

JARPNII and JARPAII

Species	Type of catch	Area/stock	Males	Females	Total landed	Struck and lost
Antarctic minke whale	Scientific permit	Areas III E, IV, V W	237	269	506	1
Antarctic fin whale	Scientific permit	Areas III E, IV, V W	1	0	1	0
Common minke whale	Scientific permit	W. North Pacific	99	63	162	Offshore: 0 Coastal: 3
Sei whale	Scientific permit	W. North Pacific	46	54	100	1
Bryde's whale	Scientific permit	W. North Pacific	18	32	50	0
Sperm whale	Scientific permit	W. North Pacific	0	1	1	0

6.3 Anthropogenic mortality of large whales for the calendar year 2009 or the season 2009/10

6.3.1 Observed or reported ship strikes of large whales (including non-fatal events)

The FAJ has continuously exchanged information on this with the Ministry of Land Infrastructure and Transport, which is responsible for the control and monitoring of vessel navigations and safety.

6.3.2 Fishery bycatch of large whales

Provisional figures for incidental mortality of large cetaceans (bycatch) by Japanese fisheries, by Prefecture in January-December 2009, are shown below. Species and figures are based on the reports of prefecture governments to the FAJ, which are reports from individual fishermen or fishery cooperative unions.

Whale species	No.	Location	Fate	Target fish species	Gear	How observed	Source or contact
Common minke whale	1	Hokkaido	D	NA	GNS	F	FAJ
	4	Hokkaido	K		FPN		
	1	Aomori					
	1	Aomori	D				
	15	Iwate	K				
	8	Miyagi					
	1	Ibaraki					
	1	Chiba					
	3	Niigata					
	14	Toyama					
	22	Ishikawa					
	2	Fukui					
1	Shizuoka						

	5	Mie					
	7	Kyoto					
	5	Wakayama					
	3	Shimane					
	3	Yamaguchi					
	3	Kochi					
	1	Fukuoka					
	1	Saga					
	14	Nagasaki					
	1	Oita					
	1	Miyazaki					
	1	Kagoshima					
Humpback whale	1	Chiba					
	1	Okayama	D				
	1	Tokushima	K				
	1	Nagasaki					

Gear: FPN=Stationary uncovered pounds nets, GNS =set gillnets

How observed: F = Fishery onboard observer

Target fish species : NA=not available

Fate of whale: D = discarded dead or seriously injured, K = kept for sale or specimen

7. STATISTICS FOR SMALL CETACEANS

The Government of Japan has as policy not to present information on small cetaceans in the progress report.

8. STRANDINGS

The provisional number of large whale strandings in Japan, for the period January-December 2009, is shown below. 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.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Common minke whale	4	4	FAJ	-
Fin whale	1	1	FAJ	-
Sei whale	1	1	FAJ	-
North Pacific right whale	1	1	FAJ	-
Humpback whale	1	1	FAJ	-
Sperm whale	8*	7*	FAJ	-

*: One sperm whale had strayed into harbors but was safely driven back to sea.

Information on stranded cetaceans has been officially collected by the Far Seas Fisheries Division of the FAJ, 1-2-1, Kasumigaseki, Tokyo 100-8597, Japan. NRIFSF assisted FAJ to compiling the data and necessary sampling. In addition, ICR and the National Science Museum (3-23-1, Hyakunin-cho, Shinjuku-ku, Tokyo 169-0073, Japan) voluntarily collected relevant information on strandings (see the part of ICR in this report).

9. OTHER STUDIES AND ANALYSES

In relation to development for ecosystem modeling by Ecopath with Ecosim (EwE), Watanabe (NRIFSF) obtained feeding parameters, such as stomach content composition and daily ration, of the major large-sized fish and squid species, like skipjack tuna *Katsuwonus pelamis*, blue shark *Prionace glauca*, and lancetfish *Alepisaurus ferox* collected by gillnet and/or pole-and-line samplings in the western North Pacific.

10. LITERATURE CITED

11. PUBLICATIONS

11.1 Published or 'In Press' papers only

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11.2 Unpublished literature

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- Konishi, K., Tamura, T., Goto, M., Bando, T., Kishiro, T., Yoshida, H. and Kato, H. 2009. Trend of nutrition indices in common minke, sei and Bryde's whales in the western North Pacific. Abstracts for the Fall Meeting of Japanese Society of Fisheries Science, Morioka, Japan, October 2009. [Available from the author, In Japanese]
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- Murase, H., Tamura, T., Isoda, T., Okamoto, R., Kato, H., Yonezaki, S., Watanabe, H., Tojyo, N., Matsukura, R., Miyashita, K., Kiwada, H., Matsuoka, K., Nishiwaki, S., Inagake, D., Okazaki, M., Okamura, H., Fujise, Y. and Kawahara, S. (2009). Prey preference of common minke (*Balaenoptera acutorostrata*), Bryde's (*B. edeni*) and sei (*B. borealis*) whales in the western North Pacific. North Pacific Marine Science organization (PICES), 18th Annual Meeting, Cheju, Korea October 2009.
- Okamura, H. 2009. Resource selection analysis for pseudoreplicated data of wild animals. Abstracts, Toukei Kanren Gakkai Rengou Taikai. Kyoto. September 2009. p. 151. [Available from the author, In Japanese]
- Okamura, H., Nagashima, H., and Yonezaki, S. (2009) Quantitative assessment of impacts on the sandlance population by consumption of minke whales. North Pacific Marine Science organization (PICES), 18th Annual Meeting, Cheju, Korea October 2009.
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- Yamaguchi, A., Hanamiya, Y., Watanabe, H. and Murase, H. 2010. Quantitative estimation on the role of biological pump of macro zooplankton in the western North Pacific in summer. Abstracts for the Spring

Meeting of Japanese Society of Fisheries Science. Tokyo. March 2009. [Available from the author, In Japanese]

Yoshida, H., Kanaji, Y., & Miyashita, T. 2010. Cookiecutter shark scars on common minke whale bodies – Observation and estimation of stock mixing ratio-. Bilateral workshop on whales and dolphins between Korea and Japan, Cetacean Research Institute, National Fisheries Research and Development Institute, Ulsan, Korea, January 2010.

Watanabe, K., Watanabe, H., Sugisaki, H., Sawada, K., Okazaki, Y. and Kunisho, T. 2009 First database in the world for species identification of acoustically detected micronekton myctophid fishes collected in the subarctic and transition regions of the western North Pacific. Abstracts for the Spring Meeting of Japanese Society of Fisheries Science. Tokyo. March 2009. [Available from the author, In Japanese]

INSTITUTE OF CETACEAN RESEARCH (ICR)

1. SPECIES AND STOCKS STUDIED

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Southern right whale	<i>Eubalaena australis</i>	Antarctic	2.1, 3.1, 4.1
North Pacific right whale	<i>Eubalaena japonica</i>	W. North Pacific	2.1, 3.1
Common minke whale	<i>Balaenoptera acutorostrata</i>	W. North Pacific	2.1; 2.2, 4.2; 4.3;4.4
Antarctic minke whale	<i>Balaenoptera bonaerensis</i>	Antarctic	2.1; 2.2; 4.2; 4.4
Sei whale	<i>Balaenoptera borealis</i>	Antarctic, W. North Pacific	2.1, 4.1, 4.2; 4.4
Bryde's whale	<i>Balaenoptera edeni</i>	W. North Pacific	2.1; 4.2; 4.4
Blue whale	<i>Balaenoptera musculus</i>	Antarctic, W. North Pacific	2.1; 3.1, 4.1, 4.4
Fin whale	<i>Balaenoptera physalus</i>	Antarctic, W. North Pacific	2.1; 4.1; 4.2, 4.4
Humpback whale	<i>Megaptera novaeangliae</i>	Antarctic, W. North Pacific	2.1; 2.2; 3.1; 4.1, 4.4
Sperm whale	<i>Physeter macrocephalus</i>	Antarctic, W. North Pacific	2.1, 4.1, 4.2; 4.3;4.4
Southern bottlenose whale	<i>Hyperoodon planifrons</i>	Antarctic	2.1

2. SIGHTING DATA

2.1 Field work

2.1.1 Systematic

The Institute of Cetacean Research (ICR) conducts systematic sighting surveys along their primary research programs JARPA II (Japanese Whale Research Program under Special Permit in the Antarctic-Phase II) and JARPN II (Japanese Whale Research Program under Special Permit in the North Pacific-Phase II). Below is a summary of the sighting data obtained during the 2009/10 austral summer season in the Antarctic Areas III, IV and V and during year 2009 in the North Pacific. Details of the sighting component of those surveys are given in the cruise reports: SC/62/O3 for JARPA II and SC/62/O4 for JARPN II-offshore component and SC/62/O5, SC/62/O6 for JARPN II-coastal component.

Sighting surveys in transit from Japan to SOWER home port and from SOWER home port to Japan are conducted by ICR scientists. These data are being examined and will be summarized in future.

JARPA II-all vessels

Target species	Date	Area	School / No. of sightings	Contact person/institute and references
Antarctic minke whale	14 Dec/09-20 Mar/10	Areas III, IV and V	986/2,242	S. Nishiwaki (ICR); SC/62/O3
Blue whale	14 Dec/09-20 Mar/10	Areas III, IV and V	24/40	S. Nishiwaki (ICR); SC/62/O3
Fin whale	14 Dec/09-20 Mar/10	Areas III, IV and V	56/189	S. Nishiwaki (ICR); SC/62/O3
Sei whale	14 Dec/09-20 Mar/10	Areas III, IV and V	1/2	S. Nishiwaki (ICR); SC/62/O3
Humpback whale	14 Dec/09-20 Mar/10	Areas III, IV and V	603/1,187	S. Nishiwaki (ICR); SC/62/O3
Southern right whale	14 Dec/09-20 Mar/10	Areas III, IV and V	2/2	S. Nishiwaki (ICR); SC/62/O3
Sperm whale	14 Dec/09-20 Mar/10	Areas III, IV and V	127/130	S. Nishiwaki (ICR); SC/62/O3
Southern bottlenose whale	14 Dec/09-20 Mar/10	Areas III, IV and V	30/48	S. Nishiwaki (ICR); SC/62/O3

JARPN II-Sighting and sampling vessels

Target species	Date	Area	School / No. of sightings	Contact person/institute and references
Common minke whale	16 May – 25 July / 2009	Western North Pacific	51 / 52	T. Bando(ICR); SC/62/O4
Sei whale	16 May – 25 July / 2009	Western North Pacific	213 / 386	T. Bando(ICR); SC/62/O4
Bryde's whale	16 May – 25 July / 2009	Western North Pacific	72 / 87	T. Bando(ICR); SC/62/O4
Blue whale	16 May – 25 July / 2009	Western North Pacific	13 / 15	T. Bando(ICR); SC/62/O4
Fin whale	16 May – 25 July / 2009	Western North Pacific	34 / 44	T. Bando(ICR); SC/62/O4
Humpback whale	16 May – 25 July / 2009	Western North Pacific	19 / 21	T. Bando(ICR); SC/62/O4
Sperm whale	16 May – 25 July / 2009	Western North Pacific	82 / 167	T. Bando(ICR); SC/62/O4

JARPN II-Dedicated sighting Vessel

Yushin-Maru

Target species	Date	Area	School / No. of sightings	Contact person/institute and references
Common minke whale	24 May – 19 June / 2009	Western North Pacific	9 / 11	T. Bando(ICR); SC/62/O4
Sei whale	24 May – 19 June / 2009	Western North Pacific	52 / 96	T. Bando(ICR); SC/62/O4
Bryde's whale	24 May – 19 June / 2009	Western North Pacific	6 / 6	T. Bando(ICR); SC/62/O4
Fin whale	24 May – 19 June / 2009	Western North Pacific	4 / 6	T. Bando(ICR); SC/62/O4
Humpback whale	24 May – 19 June / 2009	Western North Pacific	2 / 2	T. Bando(ICR); SC/62/O4
Sperm whale	24 May – 19 June / 2009	Western North Pacific	37 / 120	T. Bando(ICR); SC/62/O4
Common minke whale	14 May – 23 May / 2009	Western North Pacific (Transit)	3 / 3	K. Matsuoka (ICR)
Fin whale	14 May – 23 May / 2009	Western North Pacific (Transit)	1 / 1	K. Matsuoka (ICR)
Humpback whale	14 May – 23 May / 2009	Western North Pacific (Transit)	2 / 2	K. Matsuoka (ICR)
North Pacific right whale	14 May – 23 May / 2009	Western North Pacific (Transit)	1 / 1	K. Matsuoka (ICR)
Sperm whale	14 May – 23 May / 2009	Western North Pacific (Transit)	10 / 21	K. Matsuoka (ICR)

Kaiko-Maru

Target species	Date	Area	School / No. of sightings	Contact person/institute and references
Common minke whale	23 May – 23 June / 2009	Western North Pacific	2 / 2	K. Matsuoka (ICR)
Sei whale	23 May – 23 June / 2009	Western North Pacific	15 / 24	K. Matsuoka (ICR)
Blue whale	23 May – 23 June / 2009	Western North Pacific	1 / 1	K. Matsuoka (ICR)
Bryde's whale	23 May – 23 June / 2009	Western North Pacific	40 / 55	K. Matsuoka (ICR)

Fin whale	23 May – 23 June / 2009	Western North Pacific	2 / 3	K. Matsuoka (ICR)
Humpback whale	23 May – 23 June / 2009	Western North Pacific	17 / 26	K. Matsuoka (ICR)
Sperm whale	23 May – 23 June / 2009	Western North Pacific	55 / 199	K. Matsuoka (ICR)

2.1.2 Opportunistic, platforms of opportunity

None.

2.2 Analyses/development of techniques

Target species	Date	Area	Method/effort	Parameter/factors	Contact person
Antarctic minke	Dec 89-Mar 05	Antarctic	Line transect; standard method	Distribution; abundance	T. Hakamada (in prep.)
Humpback	Dec 89-Mar 05	Antarctic	Line transect; standard method	Distribution; abundance	K. Matsuoka (in press JCRM)
Common minke	May 06-July 07	W North Pacific	Line transect; standard method	Distribution; abundance	T. Hakamada (SC/62/NPM2)

3. MARKING DATA

3.1 Field work

3.1.1 Natural marking data

JARPA II

Species	Feature	Area/stock	No. photo- id'd	Catalogue (Y/N)*	Catalogue total	Contact person/institute; refs
Blue whale	Body	Area III	3			S. Nishiwaki (ICR); SC/62/O3
Blue whale	Body	Area IV	5			S. Nishiwaki (ICR); SC/62/O3
Humpback whale	Lateral marking	Area III	17			S. Nishiwaki (ICR); SC/62/O3
Humpback whale	Lateral marking	Area IV	45			S. Nishiwaki (ICR); SC/62/O3
Humpback whale	Lateral marking	Area V	48			S. Nishiwaki (ICR); SC/62/O3
Southern right whale	Head	Area IV	2			S. Nishiwaki (ICR); SC/62/O3

*: These photos will be examined and incorporated into the ICR catalogue.

JARPN II-Offshore component

Sighting and Sampling Vessels

Species	Feature	Area/stock	No. photo- id'd	Catalogue (Y/N)*	Catalogue total	Contact person/institute; refs
Blue whale	Dorsal fin	Western North Pacific	1			T. Bando (ICR); SC/62/O4
Blue whale	Body	Western North Pacific	7			T. Bando (ICR); SC/62/O4

*: Catalogue under construction

Dedicated Sighting Vessels

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)*	Catalogue total	Contact person/institute
Humpback whale	Body	Western North Pacific	5			K. Matsuoka (ICR)
Humpback whale	Dorsal fin	Western North Pacific	7			K. Matsuoka (ICR)
North Pacific right whale	Head	Western North Pacific (Transit)	1			K. Matsuoka (ICR)

*: Catalogue under construction

3.1.2 Artificial marking data

None.

3.1.3 Telemetry data

None.

3.2 Analyses/development of techniques

None.

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

Tissue and biological samples (lethal and non-lethal sampling) were obtained during the surveys of the JARPA II during the 2009/10 austral summer season in Areas III, IV and V. The third full-scale survey of JARPA II was carried out between 14 December 2009 and 20 March 2010. The total searching distance was 8,232.0 n.miles. Out of 511 schools (1,032 individuals) of primary sighted Antarctic minke whales by sighting/sampling vessels, 476 schools (967 individuals) were targeted for sampling, and a total of 506 animals were sampled. Out of 9 schools (40 individuals) of primary sighted fin whales by sighting/sampling vessels, one animal was sampled.

The 2009 JARPN II offshore survey was conducted from 10 May to 29 July in sub-areas 7, 8 and 9 of western North Pacific. The total searching distance was 3,757n.miles. Out of 52 common minke whales sighted, 43 animals were sampled; out of 386 sei whales sighted, 100 were sampled; out of 87 Bryde's whales sighted, 50 animals were sampled; out of 167 sperm whales sighted, 1 was sampled. The 2009 JARPN II coastal survey of Sanriku was conducted between 22 April and 21 May. The total searching distance was 4,756.1n.miles. Out of 111 schools (112 individuals) sighted, 60 animals were sampled. The 2009 coastal survey of Kushiro was conducted from 5 September to 17 October. The total searching distance was 5,136.2n.miles. Out of 106 schools (107 individuals) sighted, 59 animals were sampled. Details of these surveys are given in the cruise reports: SC/62/O3 for JARPA II and SC/62/O4 for JARPN II-offshore component, SC/62/O5 for JARPN II-coastal component (Ayukawa) and SC/62/O6 for JARPN II-coastal component (Kushiro).

A summary of the samples and data obtained are given in items 4.1 and 4.2 below.

4.1 Biopsy samples (summary only)

JARPA II

Species	Area/stock	Calendar year/season - no. collected	Archived (Y/N)	No. analysed *	Total holdings	Contact person/institute
Fin whale	Area III	09/10-1	Y	0		S. Nishiwaki (ICR); SC/62/O3
Humpback whale	Area III	09/10-12	Y	0		S. Nishiwaki (ICR); SC/62/O3
Humpback whale	Area IV	09/10-33	Y	0		S. Nishiwaki (ICR); SC/62/O3
Humpback whale	Area V	09/10-39	Y	0		S. Nishiwaki (ICR); SC/62/O3
Southern right whale	Area IV	09/10-1	Y	0		S. Nishiwaki (ICR); SC/62/O3

*: Under analysis

JARPN II-Offshore component

Sighting and Sampling Vessels

Species	Area/stock	Calendar year/ season - no. collected	Archived (Y/N)	No. analysed *	Total holdings	Contact person/institute
Blue whale	Western North Pacific	2009-6	Y	0		T. Bando(ICR); SC/62/O4
Sei whale	Western North Pacific	2009-7	Y	0		T. Bando(ICR); SC/62/O4
Sperm whale	Western North Pacific	2009-1	Y	0		T. Bando(ICR); SC/62/O4

*: Under analysis

Dedicated Sighting Vessels

Species	Area/stock	Calendar year/ season - no. collected	Archived (Y/N)	No. analysed *	Total holdings	Contact person/institute
Sei whale	Western North Pacific	2009-2	Y	0		T. Bando(ICR); SC/62/O4

*: Under analysis

4.2 Samples from directed catches (scientific permits)

JARPA II

Species	Area/stock	Samples and Data	No. collected	Archived (Y/N)	No. analysed *	Contact person/institut e
Antarctic minke whale	Antarctic	Photographic record and external character	504	Y		ICR
Antarctic minke whale	Antarctic	Body length and sex	506	Y		ICR
Antarctic minke whale	Antarctic	External body proportion	506	Y		ICR
Antarctic minke whale	Antarctic	Body weight	506	Y		ICR
Antarctic minke whale	Antarctic	Body weight by parts	3	Y		ICR
Antarctic minke whale	Antarctic	Skull measurement (Length and breadth)	497	Y		ICR
Antarctic minke whale	Antarctic	Standard measurements of blubber thickness	506	Y		ICR
Antarctic minke whale	Antarctic	Observation of lactation status	269	Y		ICR
Antarctic minke whale	Antarctic	Measurement of mammary gland	269	Y		ICR
Antarctic minke whale	Antarctic	Testis weight	237	Y		ICR
Antarctic minke whale	Antarctic	Weight of stomach content	506	Y		ICR
Antarctic minke whale	Antarctic	Photographic record of foetus	186	Y		ICR
Antarctic minke whale	Antarctic	Foetal length and weight	186	Y		ICR
Antarctic minke whale	Antarctic	Fetal ocular lens for age determination	17	Y		ICR
Antarctic minke whale	Antarctic	Foetal skin for genetic study	182	Y		ICR
Antarctic minke whale	Antarctic	Diatom film observation	506	Y		ICR
Antarctic minke whale	Antarctic	Blood plasma for physiological study	454	Y		ICR

Antarctic minke whale	Antarctic	Earplug for age determination	505	Y		ICR
Antarctic minke whale	Antarctic	Ocular lens for age determination	506	Y		ICR
Antarctic minke whale	Antarctic	Tympanic bulla for chemical analysis	48	Y		ICR
Antarctic minke whale	Antarctic	Largest baleen plate for chemical analysis	506	Y		ICR
Antarctic minke whale	Antarctic	Vertebral epiphyses for biological study	438	Y		ICR
Antarctic minke whale	Antarctic	Observation and collection of ovary	269	Y		ICR
Antarctic minke whale	Antarctic	Histological sample of endometrium	17	Y		ICR
Antarctic minke whale	Antarctic	Histological sample of mammary gland	269	Y		ICR
Antarctic minke whale	Antarctic	Histological sample of testis	237	Y		ICR
Antarctic minke whale	Antarctic	Tissue samples for genetic study	506	Y		ICR
Antarctic minke whale	Antarctic	Blubber, muscle and liver tissues for environmental monitoring	506	Y		ICR
Antarctic minke whale	Antarctic	Lung and liver tissues for environmental monitoring	39	Y		ICR
Antarctic minke whale	Antarctic	Gross pathological observation (thyroid, lung, and liver)	506	Y		ICR
Antarctic minke whale	Antarctic	Tissues for histopathological study	18	Y		ICR
Antarctic minke whale	Antarctic	Tissues for various study	6	Y		ICR
Antarctic minke whale	Antarctic	Stomach contents for food and feeding study	56	Y		ICR
Antarctic minke whale	Antarctic	Stomach contents for environmental monitoring	21	Y		ICR
Antarctic minke whale	Antarctic	Samples of internal and external parasites	15	Y		ICR
Antarctic minke whale	Antarctic	Stomach contents for DNA study	7	Y		ICR
Antarctic minke whale	Antarctic	Gut contents for food and feeding study	21	Y		ICR
Antarctic minke whale	Antarctic	Fundus for food and feeding study	2	Y		ICR
Antarctic minke whale	Antarctic	Tissue samples for monitoring infectious disease	419	Y		ICR
Antarctic minke whale	Antarctic	Tissues for nutrition study	5	Y		ICR
Antarctic minke whale	Antarctic	Uterus and placenta tissues for histological study	5	Y		ICR
Antarctic minke whale	Antarctic	Fetal sample for clarification of hind-limb disappearance mechanism	4	Y		ICR
Fin whale	Antarctic	Photographic record and external character	1	Y		ICR
Fin whale	Antarctic	Body length and sex	1	Y		ICR
Fin whale	Antarctic	External body proportion	1	Y		ICR
Fin whale	Antarctic	Body weight by parts	1	Y		ICR
Fin whale	Antarctic	Skull measurement (Length and breadth)	1	Y		ICR
Fin whale	Antarctic	Detailed measurements of blubber thickness	1	Y		ICR
Fin whale	Antarctic	Histological sample of testis	1	Y		ICR
Fin whale	Antarctic	Histological sample of epididymis	1	Y		ICR
Fin whale	Antarctic	Weight of stomach content	1	Y		ICR
Fin whale	Antarctic	Number of ribs	1	Y		ICR
Fin whale	Antarctic	Number of vertebra	1	Y		ICR

Fin whale	Antarctic	Diatom film observation	1	Y		ICR
Fin whale	Antarctic	Diatom film sample	1	Y		ICR
Fin whale	Antarctic	Blood plasma for physiological study	1	Y		ICR
Fin whale	Antarctic	Earplug for age determination	1	Y		ICR
Fin whale	Antarctic	Ocular lens for age determination	1	Y		ICR
Fin whale	Antarctic	Tympanic bulla for chemical analysis	1	Y		ICR
Fin whale	Antarctic	Largest baleen plate for chemical analysis	1	Y		ICR
Fin whale	Antarctic	Vertebral epiphyses for biological study	1	Y		ICR
Fin whale	Antarctic	Histological sample of testis	1	Y		ICR
Fin whale	Antarctic	Histological sample of epididymis	1	Y		ICR
Fin whale	Antarctic	Tissue samples for genetic study	1	Y		ICR
Fin whale	Antarctic	Blubber, muscle and liver tissues for environmental monitoring	1	Y		ICR
Fin whale	Antarctic	Lung and liver tissues for environmental monitoring	1	Y		ICR
Fin whale	Antarctic	Gross pathological observation (thyroid, lung, and liver)	1	Y		ICR
Fin whale	Antarctic	Tissues for histopathological study	1	Y		ICR
Fin whale	Antarctic	Muscle, liver, kidney, lumbar and blubber tissues for lipid analysis	1	Y		ICR
Fin whale	Antarctic	Muscle and blubber tissues for various analysis	1	Y		ICR
Fin whale	Antarctic	Stomach contents for food and feeding study	1	Y		ICR
Fin whale	Antarctic	Samples of internal and external parasites	1	Y		ICR
Fin whale	Antarctic	Gut contents for food and feeding study	1	Y		ICR
Fin whale	Antarctic	Fundus for food and feeding study	1	Y		ICR
Fin whale	Antarctic	Tissues samples for monitoring infectious disease	1	Y		ICR
Fin whale	Antarctic	Tissues for nutrition study	1	Y		ICR

*: Samples and data are currently under analysis

JARPN II-Offshore component

Species	Area/stock	Samples and Data	No. collected	Archived (Y/N)	No. analysed *	Contact person/institute
Common minke whale	Western North Pacific	Body length and sex	43	Y		ICR
Common minke whale	Western North Pacific	External body proportion	43	Y		ICR
Common minke whale	Western North Pacific	Photographic record and external character	43	Y		ICR
Common minke whale	Western North Pacific	Diatom film record	43	Y		ICR
Common minke whale	Western North Pacific	Standard measurements of blubber thickness (five points)	43	Y		ICR
Common minke whale	Western North Pacific	Detailed measurements of blubber thickness (eleven points)	17	Y		ICR
Common minke whale	Western North Pacific	Body weight	43	Y		ICR

Common minke whale	Western North Pacific	Body weight by parts	17	Y		ICR
Common minke whale	Western North Pacific	Skin tissues for DNA study	43	Y		ICR
Common minke whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for heavy metal analysis	43	Y		ICR
Common minke whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for organochlorines analysis	43	Y		ICR
Common minke whale	Western North Pacific	Blubber, muscle tissues for ingredient analysis	43	Y		ICR
Common minke whale	Western North Pacific	Tissue for nutritional component analysis	5	Y		ICR
Common minke whale	Western North Pacific	Lung tissue for atmospheric analysis	5	Y		ICR
Common minke whale	Western North Pacific	Tissues for lipid analysis	17	Y		ICR
Common minke whale	Western North Pacific	Tissues for various analysis	43	Y		ICR
Common minke whale	Western North Pacific	Tissues for virus test	39	Y		ICR
Common minke whale	Western North Pacific	Mammary gland; lactation status, measurement and histological sample	7	Y		ICR
Common minke whale	Western North Pacific	Uterine horn; measurement and endometrium sample	7	Y		ICR
Common minke whale	Western North Pacific	Collection of ovary	7	Y		ICR
Common minke whale	Western North Pacific	Photographic record of foetus	3	Y		ICR
Common minke whale	Western North Pacific	Foetal sex (identified by visual observation)	3	Y		ICR
Common minke whale	Western North Pacific	Foetal length and weight	3	Y		ICR
Common minke whale	Western North Pacific	External measurements of foetus	3	Y		ICR
Common minke whale	Western North Pacific	Foetal blubber tissues for DNA study	3	Y		ICR
Common minke whale	Western North Pacific	Foetal tissues for various analysis	3	Y		ICR
Common minke whale	Western North Pacific	Foetal lens for age determination	3	Y		ICR
Common minke whale	Western North Pacific	Testis and epididymis; weight and histological sample	36	Y		ICR
Common minke whale	Western North Pacific	Collection of plasma sample	43	Y		ICR
Common minke whale	Western North Pacific	Collection of whole blood sample	43	Y		ICR
Common minke whale	Western North Pacific	Whole blood samples from umbilical cord	1	Y		ICR
Common minke whale	Western North Pacific	Plasma samples from umbilical cord	3	Y		ICR
Common minke whale	Western North Pacific	Stomach content, conventional record	43	Y		ICR
Common minke whale	Western North Pacific	Volume and weight of stomach content in each compartment	43	Y		ICR
Common minke whale	Western North Pacific	Stomach contents for feeding study	41	Y		ICR
Common minke whale	Western North Pacific	Record of external parasites	43	Y		ICR
Common minke whale	Western North Pacific	Collection of external parasites	2	Y		ICR
Common minke whale	Western North Pacific	Record of internal parasites	43	Y		ICR
Common minke whale	Western North Pacific	Collection of internal parasites	1	Y		ICR
Common minke whale	Western North Pacific	Earplug for age determination	43	Y		ICR
Common minke whale	Western North Pacific	Tympanic bulla for age determination	41	Y		ICR
Common minke whale	Western North Pacific	Lens for age determination	43	Y		ICR
Common minke whale	Western North Pacific	Largest baleen plate for morphologic study and age determination	43	Y		ICR

Common minke whale	Western North Pacific	Baleen plate measurements (length and breadth)	42	Y		ICR
Common minke whale	Western North Pacific	Length of each baleen plate series	43	Y		ICR
Common minke whale	Western North Pacific	Vertebral epiphyses sample	42	Y		ICR
Common minke whale	Western North Pacific	Number of ribs	43	Y		ICR
Common minke whale	Western North Pacific	Brain weight	15	Y		ICR
Common minke whale	Western North Pacific	Skull measurements (length and breadth)	43	Y		ICR
Sei whale	Western North Pacific	Body length and sex	100	Y		ICR
Sei whale	Western North Pacific	External body proportion	100	Y		ICR
Sei whale	Western North Pacific	Photographic record and external character	100	Y		ICR
Sei whale	Western North Pacific	Diatom film record	100	Y		ICR
Sei whale	Western North Pacific	Standard measurements of blubber thickness (five points)	100	Y		ICR
Sei whale	Western North Pacific	Detailed measurements of blubber thickness (eleven points)	17	Y		ICR
Sei whale	Western North Pacific	Body weight	100	Y		ICR
Sei whale	Western North Pacific	Body weight by parts	17	Y		ICR
Sei whale	Western North Pacific	Blubber tissues for DNA study	100	Y		ICR
Sei whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for heavy metal analysis	100	Y		ICR
Sei whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for organochlorines analysis	100	Y		ICR
Sei whale	Western North Pacific	Tissue for nutritional component analysis	5	Y		ICR
Sei whale	Western North Pacific	Lung tissue for chemical analysis	11	Y		ICR
Sei whale	Western North Pacific	Tissues for lipid analysis	17	Y		ICR
Sei whale	Western North Pacific	Tissues for various analysis	100	Y		ICR
Sei whale	Western North Pacific	Tissues for virus test	79	Y		ICR
Sei whale	Western North Pacific	Mammary gland; lactation status, measurement and histological sample	54	Y		ICR
Sei whale	Western North Pacific	Collection of maternal milk sample	2	Y		ICR
Sei whale	Western North Pacific	Uterine horn; measurement and endometrium sample	54	Y		ICR
Sei whale	Western North Pacific	Collection of ovary	54	Y		ICR
Sei whale	Western North Pacific	Photographic record of foetus	35	Y		ICR
Sei whale	Western North Pacific	Foetal sex (identified by visual observation)	32	Y		ICR
Sei whale	Western North Pacific	Foetal length and weight	35	Y		ICR
Sei whale	Western North Pacific	External measurements of foetus	33	Y		ICR
Sei whale	Western North Pacific	Foetal blubber tissues for DNA study	34	Y		ICR
Sei whale	Western North Pacific	Foetal tissues for various analysis	32	Y		ICR
Sei whale	Western North Pacific	Foetal lens for age determination	32	Y		ICR
Sei whale	Western North Pacific	Testis and epididymis; weight and histological sample	46	Y		ICR
Sei whale	Western North Pacific	Collection of plasma sample	100	Y		ICR
Sei whale	Western North Pacific	Collection of whole blood sample	100	Y		ICR

Sei whale	Western North Pacific	Whole blood samples from umbilical cord	27	Y		ICR
Sei whale	Western North Pacific	Plasma samples from umbilical cord	32	Y		ICR
Sei whale	Western North Pacific	Stomach content, conventional record	100	Y		ICR
Sei whale	Western North Pacific	Volume and weight of stomach content in each compartment	100	Y		ICR
Sei whale	Western North Pacific	Stomach contents for feeding study	80	Y		ICR
Sei whale	Western North Pacific	Record of external parasites	100	Y		ICR
Sei whale	Western North Pacific	Collection of external parasites	3	Y		ICR
Sei whale	Western North Pacific	Record of internal parasites	100	Y		ICR
Sei whale	Western North Pacific	Collection of internal parasites	5	Y		ICR
Sei whale	Western North Pacific	Earplug for age determination	100	Y		ICR
Sei whale	Western North Pacific	Tympanic bulla for age determination	100	Y		ICR
Sei whale	Western North Pacific	Lens for age determination	100	Y		ICR
Sei whale	Western North Pacific	Largest baleen plate for morphologic study and age determination	100	Y		ICR
Sei whale	Western North Pacific	Baleen plate measurements (length and breadth)	100	Y		ICR
Sei whale	Western North Pacific	Length of each baleen plate series	97	Y		ICR
Sei whale	Western North Pacific	Vertebral epiphyses sample	100	Y		ICR
Sei whale	Western North Pacific	Number of vertebrae	17	Y		ICR
Sei whale	Western North Pacific	Number of ribs	100	Y		ICR
Sei whale	Western North Pacific	Brain weight	17	Y		ICR
Sei whale	Western North Pacific	Skull measurements (length and breadth)	98	Y		ICR
Bryde's whale	Western North Pacific	Body length and sex	50	Y		ICR
Bryde's whale	Western North Pacific	External body proportion	50	Y		ICR
Bryde's whale	Western North Pacific	Photographic record and external character	50	Y		ICR
Bryde's whale	Western North Pacific	Diatom film record	50	Y		ICR
Bryde's whale	Western North Pacific	Standard measurements of blubber thickness (five points)	50	Y		ICR
Bryde's whale	Western North Pacific	Detailed measurements of blubber thickness (eleven points)	9	Y		ICR
Bryde's whale	Western North Pacific	Body weight	50	Y		ICR
Bryde's whale	Western North Pacific	Body weight by parts	9	Y		ICR
Bryde's whale	Western North Pacific	Blubber tissues for DNA study	50	Y		ICR
Bryde's whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for heavy metal analysis	50	Y		ICR
Bryde's whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for organochlorines analysis	50	Y		ICR
Bryde's whale	Western North Pacific	Tissue for nutritional component analysis	5	Y		ICR
Bryde's whale	Western North Pacific	Lung tissue for chemical analysis	3	Y		ICR
Bryde's whale	Western North Pacific	Tissues for lipid analysis	9	Y		ICR
Bryde's whale	Western North Pacific	Tissues for various analysis	50	Y		ICR
Bryde's whale	Western North Pacific	Tissues for virus test	27	Y		ICR

Bryde's whale	Western North Pacific	Mammary gland; lactation status, measurement and histological sample	32	Y		ICR
Bryde's whale	Western North Pacific	Collection of maternal milk sample	2	Y		ICR
Bryde's whale	Western North Pacific	Uterine horn; measurement and endometrium sample	32	Y		ICR
Bryde's whale	Western North Pacific	Collection of ovary	32	Y		ICR
Bryde's whale	Western North Pacific	Photographic record of foetus	10	Y		ICR
Bryde's whale	Western North Pacific	Foetal sex (identified by visual observation)	9	Y		ICR
Bryde's whale	Western North Pacific	Foetal length and weight	10	Y		ICR
Bryde's whale	Western North Pacific	External measurements of foetus	9	Y		ICR
Bryde's whale	Western North Pacific	Foetal blubber tissues for DNA study	10	Y		ICR
Bryde's whale	Western North Pacific	Foetal tissues for various analysis	9	Y		ICR
Bryde's whale	Western North Pacific	Foetal lens for age determination	9	Y		ICR
Bryde's whale	Western North Pacific	Testis and epididymis; weight and histological sample	18	Y		ICR
Bryde's whale	Western North Pacific	Collection of plasma sample	50	Y		ICR
Bryde's whale	Western North Pacific	Collection of whole blood sample	50	Y		ICR
Bryde's whale	Western North Pacific	Whole blood samples from umbilical cord	8	Y		ICR
Bryde's whale	Western North Pacific	Plasma samples from umbilical cord	8	Y		ICR
Bryde's whale	Western North Pacific	Stomach content, conventional record	50	Y		ICR
Bryde's whale	Western North Pacific	Volume and weight of stomach content in each compartment	50	Y		ICR
Bryde's whale	Western North Pacific	Stomach contents for feeding study	45	Y		ICR
Bryde's whale	Western North Pacific	Record of external parasites	50	Y		ICR
Bryde's whale	Western North Pacific	Collection of external parasites	3	Y		ICR
Bryde's whale	Western North Pacific	Record of internal parasites	50	Y		ICR
Bryde's whale	Western North Pacific	Collection of internal parasites	2	Y		ICR
Bryde's whale	Western North Pacific	Earplug for age determination	50	Y		ICR
Bryde's whale	Western North Pacific	Tympanic bulla for age determination	50	Y		ICR
Bryde's whale	Western North Pacific	Lens for age determination	50	Y		ICR
Bryde's whale	Western North Pacific	Largest baleen plate for morphologic study and age determination	50	Y		ICR
Bryde's whale	Western North Pacific	Baleen plate measurements (length and breadth)	49	Y		ICR
Bryde's whale	Western North Pacific	Length of each baleen plate series	50	Y		ICR
Bryde's whale	Western North Pacific	Vertebral epiphyses sample	50	Y		ICR
Bryde's whale	Western North Pacific	Number of vertebrae	9	Y		ICR
Bryde's whale	Western North Pacific	Number of ribs	50	Y		ICR
Bryde's whale	Western North Pacific	Brain weight	9	Y		ICR
Bryde's whale	Western North Pacific	Skull measurements (length and breadth)	46	Y		ICR
Sperm whale	Western North Pacific	Body length and sex	1	Y		ICR
Sperm whale	Western North Pacific	External body proportion	1	Y		ICR

Sperm whale	Western North Pacific	Photographic record and external character	1	Y		ICR
Sperm whale	Western North Pacific	Diatom film record	1	Y		ICR
Sperm whale	Western North Pacific	Standard measurements of blubber thickness (five points)	1	Y		ICR
Sperm whale	Western North Pacific	Detailed measurements of blubber thickness (eleven points)	1	Y		ICR
Sperm whale	Western North Pacific	Body weight	1	Y		ICR
Sperm whale	Western North Pacific	Body weight by parts	1	Y		ICR
Sperm whale	Western North Pacific	Blubber tissues for DNA study	1	Y		ICR
Sperm whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for heavy metal analysis	1	Y		ICR
Sperm whale	Western North Pacific	Blubber, muscle, liver and kidney tissues for organochlorines analysis	1	Y		ICR
Sperm whale	Western North Pacific	Tissue for nutritional component analysis	1	Y		ICR
Sperm whale	Western North Pacific	Lung tissue for chemical analysis	1	Y		ICR
Sperm whale	Western North Pacific	Tissues for lipid analysis	1	Y		ICR
Sperm whale	Western North Pacific	Tissues for various analysis	1	Y		ICR
Sperm whale	Western North Pacific	Mammary gland; lactation status, measurement and histological sample	1	Y		ICR
Sperm whale	Western North Pacific	Collection of spermaceti sample	1	Y		ICR
Sperm whale	Western North Pacific	Uterine horn; measurement and endometrium sample	1	Y		ICR
Sperm whale	Western North Pacific	Collection of ovary	1	Y		ICR
Sperm whale	Western North Pacific	Collection of plasma sample	1	Y		ICR
Sperm whale	Western North Pacific	Collection of whole blood sample	1	Y		ICR
Sperm whale	Western North Pacific	Stomach content, conventional record	1	Y		ICR
Sperm whale	Western North Pacific	Volume and weight of stomach content in each compartment	1	Y		ICR
Sperm whale	Western North Pacific	Stomach contents for feeding study	1	Y		ICR
Sperm whale	Western North Pacific	Record of external parasites	1	Y		ICR
Sperm whale	Western North Pacific	Record of internal parasites	1	Y		ICR
Sperm whale	Western North Pacific	Collection of internal parasites	1	Y		ICR
Sperm whale	Western North Pacific	Maxillary teeth for age determination	1	Y		ICR
Sperm whale	Western North Pacific	Lens for age determination	1	Y		ICR
Sperm whale	Western North Pacific	Vertebral epiphyses sample	1	Y		ICR
Sperm whale	Western North Pacific	Number of vertebrae	1	Y		ICR
Sperm whale	Western North Pacific	Number of ribs	1	Y		ICR
Sperm whale	Western North Pacific	Brain weight	1	Y		ICR
Sperm whale	Western North Pacific	Skull measurements (length and breadth)	1	Y		ICR

*: Samples and data are currently under analysis

JARPN II-Coastal (Sanriku)

Species	Area/stock	Samples and Data	No. collected	Archived (Y/N)	No. analysed*	Contact person/institute
Common minke whale	Western North Pacific	Body length and sex	60	Y		ICR
Common minke whale	Western North Pacific	External body proportion	60	Y		ICR
Common minke whale	Western North Pacific	Photographic record and external character	60	Y		ICR
Common minke whale	Western North Pacific	Diatom film record	60	Y		ICR
Common minke whale	Western North Pacific	Body scar record	60	Y		ICR
Common minke whale	Western North Pacific	Measurements of blubber thickness (5 points)	60	Y		ICR
Common minke whale	Western North Pacific	Whole body weight	60	Y		ICR
Common minke whale	Western North Pacific	Skin tissues for DNA study	60	Y		ICR
Common minke whale	Western North Pacific	Muscle, liver, kidney, spleen, blubber, heart and ventral groove for various analysis	60	Y		ICR
Common minke whale	Western North Pacific	Urine for various analysis	14	Y		ICR
Common minke whale	Western North Pacific	Muscle, liver, kidney, and blubber for heavy metal analysis	60	Y		ICR
Common minke whale	Western North Pacific	Muscle, liver, kidney, and blubber for organochlorine analysis	60	Y		ICR
Common minke whale	Western North Pacific	Collection of blood plasma	54	Y		ICR
Common minke whale	Western North Pacific	Mammary gland; lactation status, measurement and histological sample	33	Y		ICR
Common minke whale	Western North Pacific	Uterine horn; measurements and endometrium sample	33	Y		ICR
Common minke whale	Western North Pacific	Collection of ovary	33	Y		ICR
Common minke whale	Western North Pacific	Photographic record of foetus	1	Y		ICR
Common minke whale	Western North Pacific	Foetal length and weight	1	Y		ICR
Common minke whale	Western North Pacific	External measurement of foetus	1	Y		ICR
Common minke whale	Western North Pacific	Collection of foetus	1	Y		ICR
Common minke whale	Western North Pacific	Testis and epididymis; weight and histological sample	27	Y		ICR
Common minke whale	Western North Pacific	Stomach contents, convenient record	60	Y		ICR
Common minke whale	Western North Pacific	Volume and weight of stomach content in each compartment	60	Y		ICR
Common minke whale	Western North Pacific	Observation of marine debris in stomach	60	Y		ICR
Common minke whale	Western North Pacific	Collection of stomach contents for feeding study	55	Y		ICR
Common minke whale	Western North Pacific	Record of external parasites	60	Y		ICR
Common minke whale	Western North Pacific	Earplug for age determination	60	Y		ICR

Common minke whale	Western North Pacific	Tympanic bulla for age determination	60	Y		ICR
Common minke whale	Western North Pacific	Eye lens for age determination	5	Y		ICR
Common minke whale	Western North Pacific	Largest baleen plate for morphologic study and age determination	60	Y		ICR
Common minke whale	Western North Pacific	Baleen plate measurements (length and breadth)	60	Y		ICR
Common minke whale	Western North Pacific	Photographic record of baleen plate series	60	Y		ICR
Common minke whale	Western North Pacific	Length of baleen series	60	Y		ICR
Common minke whale	Western North Pacific	Vertebral epiphyses sample	57	Y		ICR
Common minke whale	Western North Pacific	Number of ribs	60	Y		ICR
Common minke whale	Western North Pacific	Skull measurement (length and breadth)	55	Y		ICR

*: Samples and data are currently under analysis

JARPN II-Coastal (Kushiro)

Species	Area/stock	Samples and Data	No. collected	Archived (Y/N)	No. analysed*	Contact person/institute
Common minke whale	Western North Pacific	Body length and sex	59	Y		NRIFSF
Common minke whale	Western North Pacific	External body proportion	59	Y		NRIFSF
Common minke whale	Western North Pacific	Photographic record and external character	59	Y		NRIFSF
Common minke whale	Western North Pacific	Diatom film record	59	Y		NRIFSF
Common minke whale	Western North Pacific	Standard measurements of blubber thickness (five points)	59	Y		NRIFSF
Common minke whale	Western North Pacific	Detailed measurements of blubber thickness (eleven points)	2	Y		NRIFSF
Common minke whale	Western North Pacific	Whole body weight	59	Y		NRIFSF
Common minke whale	Western North Pacific	Body weight by parts	2	Y		NRIFSF
Common minke whale	Western North Pacific	Skin tissues (DNA)	59	Y		NRIFSF
Common minke whale	Western North Pacific	Blubber, muscle, liver and kidney tissues (Heavy metal analysis)	59	Y		NRIFSF
Common minke whale	Western North Pacific	Blubber, muscle, liver and kidney tissues (Organochlorines analysis)	59	Y		NRIFSF
Common minke whale	Western North Pacific	Tissues for various analysis	59	Y		NRIFSF
Common minke whale	Western North Pacific	Mammary gland; lactation status, measurement and histological sample	23	Y		NRIFSF
Common minke whale	Western North Pacific	Uterine horn; measurement and endometrium sample	23	Y		NRIFSF
Common minke whale	Western North Pacific	Collection of ovary	23	Y		NRIFSF
Common minke whale	Western North Pacific	Testis and epididymis; weight and histological sample	36	Y		NRIFSF
Common minke whale	Western North Pacific	Collection of blood plasma sample	58	Y		NRIFSF

Common minke whale	Western North Pacific	Stomach content, conventional record	59	Y		NRIFSF
Common minke whale	Western North Pacific	Volume and weight of stomach content in each compartment	59	Y		NRIFSF
Common minke whale	Western North Pacific	Collection of stomach contents for feeding study	49	Y		NRIFSF
Common minke whale	Western North Pacific	Record of external parasites	59	Y		NRIFSF
Common minke whale	Western North Pacific	Earplug for age determination	58	Y		NRIFSF
Common minke whale	Western North Pacific	Tympanic bulla for age determination	59	Y		NRIFSF
Common minke whale	Western North Pacific	Eye lens for age determination	59	Y		NRIFSF
Common minke whale	Western North Pacific	Largest baleen plate for morphologic study and age determination	59	Y		NRIFSF
Common minke whale	Western North Pacific	Baleen plate measurements (length and breadth)	59	Y		NRIFSF
Common minke whale	Western North Pacific	Length of each baleen plate series	59	Y		NRIFSF
Common minke whale	Western North Pacific	Photographic record of baleen plate series	59	Y		NRIFSF
Common minke whale	Western North Pacific	Vertebral epiphyses sample	59	Y		NRIFSF
Common minke whale	Western North Pacific	Number of ribs	59	Y		NRIFSF
Common minke whale	Western North Pacific	Brain weight	2	Y		NRIFSF
Common minke whale	Western North Pacific	Skull measurement (length and breadth)	59	Y		NRIFSF

*: Samples and data are currently under analysis

4.3 Samples from stranded animals*

Species	Area/Stock	Tissue type (s)	No. collected	Archived (Y/N)	No. analysed**	Contact person/institute
Common minke whale	Okhotsk Sea	Skin and/or muscle	1	Y		H. Ishikawa; ICR
Sperm whale	Western North Pacific	Skin and/or muscle	1	Y		H. Ishikawa; ICR
Humpback whale	Western North Pacific	Skin and/or muscle	1	Y		H. Ishikawa; ICR
Common minke whale	East China Sea	Skin and/or muscle	2	Y		H. Ishikawa; ICR

*: Samples are from whales stranded and reported to the Fisheries Agency of Japan as well as from other sources

** : Under analysis

4.4 Analyses/development of techniques

JARPA/JARPA II research

Abundance

Research was conducted to investigate whether or not the survey mode and survey timing have an effect on the Antarctic minke whale abundance estimates and its trend. This was made using log-linear models. The effect of other potential factors affecting abundance and trend was examined by sensitivity tests. A paper is being prepared for publication.

Antarctic humpback whale abundance and trend were estimated using JARPA data by taking additional variance into account. Abundance increased by an estimated 16.4% (95% CI = 9.5- 23.3%) per year in Area IV and

12.1% (95% CI = 1.7 – 22.6%) in Area V. Research was conducted to investigate whether factors such as survey mode and survey timing affect abundance and trend. This was made by generalized linear models and sensitivity tests. Results suggested that these factors do not affect substantially the estimates of abundance and trend. A paper was accepted for publication in the JCRM.

In a co-operative study with the Tokyo University of Marine Science and Technology microsatellite analysis of Antarctic minke whale fetus is ongoing to investigate paternity in the JARPA samples. This information will be used to estimate abundance.

Stock structure

A cooperative research project with scientists of the University of Oslo is being conducted to study a transition area of mixing of two stock of Antarctic minke whales in the Antarctic by fitting a mixing model where the fraction of whales belonging to one putative population is a function of the longitude at which it was sampled. The model can be extended beyond two populations, and incorporate both genetic and morphometric data.

Sequences of the mtDNA control region of southern right whales were obtained from all biopsy samples obtained from the 1993/94 to 2007/08 austral summer seasons in Areas IV and V. Laboratory work on microsatellite is in progress.

Laboratory work is being conducted to obtain the mtDNA control region sequences and microsatellite profiles of biopsy samples of southern humpback whales obtained in Areas III E, IV, V and VI W by JARPA II between 2005/2006 and 2009/10 austral summer seasons

In a co-operative study with the University of California at Davis, population structure of blue whales worldwide was investigated using molecular genetics markers, introns of nuclear genes. Main contribution of ICR to the project was to provide biopsy samples of the 16 blue whales obtained in Antarctic waters during JARPA in 1994-2001. A manuscript for publication is in preparation by a senior author.

Biological parameters

The preparation of ear plugs for age determination for samples collected during 2007/08 JARPA II survey is ongoing.

Marine ecosystem

Laboratory work is being conducted to examine stomach content in Antarctic minke whales and fin whale sampled during the JARPA II surveys in 2008/09. The examination includes identification of prey species and analysis of length and maturity distribution in the prey species sample.

A new study summarized the feeding habits and prey consumption of Antarctic minke whale in the Southern Ocean. The whales feed mainly before 05:00 h, which suggest that they cease to feed early in the day. Daily prey consumptions were estimated to be 83.7–325.5 kg, equivalent to 2.7–4.0% of body weight. The mean prey consumptions per capita during feeding season were 7.5 and 16.4 t for immature and mature male, 12.5 and 39.1 t for immature and mature female, respectively. In Area IV (70°–130°E), total prey consumptions of krill by Antarctic minke whales in 1999/2000 and 2001/2002 seasons were estimated to be 0.9 and 1.1 million t, respectively. In Area V (130° E–170° W including the Ross Sea), these estimates in 2000/2001 and 2002/2003 seasons were 3.9 and 4.1 million t, respectively. The estimations of feeding impact on krill resources by Antarctic minke whales in Areas IV and V were from 2.7 to 3.2%, and from 18.2 to 18.9% of krill biomasses, respectively. These results on prey consumption are important input data for the development of ecosystem modeling in the Southern Ocean (see Tamura and Konishi, 2009 under item 11.1).

Environmental changes

Hg and PCBs concentrations were measured in the muscle and blubbers of Antarctic minke and fin whales collected during 2008/09 JARPA II survey.

Imidazole dipeptides levels were measured in muscles of Antarctic minke and fin whales collected from Antarctic Ocean in 2005/06 and 2006/07 seasons. Balenine levels in the muscle of Antarctic minke whales were approximately 1400 mg/100g and carnosine levels in muscle of fin whales were up to 300 mg/100g (see Tsuji *et al.*, 2009 under item 11.1).

Other

A symposium, “*Antarctic marine ecosystem in the Ross Sea area – the forefront of research fields and perspectives*”, was held in Tokyo in April 2009. The outcome of the Kaiyo-maru and JARPA joint survey in 2004/2005 was presented in the symposium. A total of 13 oral presentations was presented by scientists from various research institute such as Tokyo University, Hokkaido University, The Graduate University for Advanced Studies, Tokyo University of Marine Science and Technology, Tokyo Kasei University, Fisheries Research Agency and the Institute of Cetacean Research. The presentations consisted of physical oceanography, primary production, zooplankton, sea bird and cetaceans. The outcome of the symposium was summarized in a

synthesis paper and it was published in Bulletin of the Japanese Society of Fisheries Oceanography (Naganobu *et al.* 2010).

JARPNII research

Abundance

The number of common minke whales distributed in the JARPN II survey area in early (May and June) and late (July and August) seasons was estimated using 2006 and 2007 JARPN II survey data. The estimates for the common minke whales were 6,395 (CV=0.717) in the early and 2,872 (CV=0.458) in the late seasons assuming $g(0)=0.798$ (SE=0.134) (SC/62/NPM9) (SC/62/NPM2).

Feeding ecology and ecosystem studies

The stomach contents of 43 common minke, 100 sei, 50 Bryde's, and 1 sperm whales sampled in sub-area 7, 8 and 9 from May to August during 2009 JARPN II survey, were analyzed. Furthermore, the stomach contents of 60 common minke whales sampled near Sanriku's coastal-area from April to May and 59 common minke whales sampled near Kushiro's coastal-area from September to October during 2009 JARPN II survey, were analyzed. Qualitative and quantitative information on prey consumption of the whale species are collected to understand their feeding ecology and role in the ecosystem.

A new study summarized the feeding strategies and prey consumption of three baleen whale species (common minke, sei and Bryde's whales) within the Kuroshio-Current extension. Stomach contents from 740 common minke, 393 Bryde's and 489 sei whales in May-September during 2000-2007 off the Pacific coast of Japan were examined during the JARPN II. Stomach contents analysis showed that the three whale species are highly dependent on small pelagic fish, i.e. Japanese anchovy, Pacific saury and mackerels in addition to copepods and euphausiids. Pianka's niche overlap index showed high diet overlap among whale species that occur in some areas where they feed on pelagic fish. Canonical correspondence analysis (CCA) indicated environmental and biological factors significantly contribute to the diet composition of whales. CCA also explained the distribution patterns of whales in relation to SST, chlorophyll a concentration and geographical variation. These analyses demonstrated that the diet composition of the baleen whales is determined by spatio-temporal environmental factors and the amount of small pelagic fish carried by the Kuroshio Current. The total seasonal prey consumption by whales in the study area was estimated to be 774 000 t of Japanese anchovy (16% of the consumed biomass), 44 000 t of Pacific saury (1% of the consumed biomass), and 140 000 t of mackerels (14% of the consumed biomass), indicating these baleen whales are important components in the ecosystem, and warrant inclusion in fisheries assessments (see Konishi *et al.*, 2009 under item 11.1).

Result of study on prey preferences of common minke, Bryde's and sei whales in the offshore region of western North Pacific using JARPNII data from 2002 to 2007 was presented to the North Pacific Marine Science Organization (PICES) 18th Annual Meeting (see item 11.3).

Effect of depth-dependent target strength on biomass estimation of Japanese anchovy was investigated as a cooperative study with Fisheries Research Institute, Japan. Japanese anchovy is one of the important prey species of baleen whales in the western North Pacific. Understand of effect of depth-dependent target strength on biomass estimation of Japanese anchovy is important to estimate its biomass. The result was presented to the Asian Fisheries Acoustic Society (AFAS) 2009 International Conference (see item 11.3).

Acoustic species identification methods for prey species of cetacean in the western North Pacific was studied as a cooperative study with Hokkaido University (see Murase *et al.*, 2009 under item 11.1).

Acoustic properties of copepods were investigated as a cooperative study with Hokkaido University. Copepods are one of the important prey species of sei whales in the western North Pacific. Understanding of acoustic properties of copepods is important to estimate their biomass (see Matsukura *et al.*, 2009 under item 11.1).

Spatial distribution patterns of prey species of common minke whales in Sendai Bay were studied as a cooperative study with Tokyo University of Marine Science and Technology (see Murase *et al.*, 2009 under item 11.1).

Environmental changes

Hg and PCBs concentrations were measured in the muscle and blubbers of common minke, Bryde's and sei whales collected during 2009 JARPN II survey.

Imidazole dipeptides levels were measured in muscles, hearts, stomachs and bloods of common minke, sei, Bryde's and sperm whales collected from western North Pacific in 2006 and 2007. Balenine levels in the muscle of common minke, sei, Bryde's whales were approximately 1000 mg/100g and anserine levels in muscle of Bryde's and sperm whales were up to 100 mg/100g (see Tsuji *et al.*, 2009 under item 11.1).

Stock structure

Control region sequencing of mtDNA was completed for the common minke whale sample collected from the coastal components (n=119) of 2009 JARPN II as well as the minke whale (n=43), Brydes whale (n=50), sei whale (n=100), and sperm whale (n=1) samples collected from the offshore part of 2009 JARPN II. Microsatellite analysis (15-17 loci depending on the species) for the same samples is on going.

Overall stock structure of the western North Pacific (WNP) common minke whales in the Korean and Japanese waters (Yellow Sea, Sea of Japan, Okhotsk Sea, and western North Pacific Ocean) was investigated based on the genetic variations at 16 microsatellite DNA markers as well as 487 base pairs of control region sequence of mitochondrial DNA (mtDNA). Analyzed samples consisted of the common minke whales collected during JARPN/JARPNII from 1994 to 2007, bycaught minke whales (bycatch) on set net fishery in Japan from 2001 to 2007, and bycatches on several different kinds of fishing net in Korea from 1999 to 2007. The main results from the two different kinds of genetic markers were concordant: two stocks of common minke whales (O and J stocks) mainly occupy the Korean and Japanese waters. The microsatellite analysis also suggested the possibility of the single sub-stock in the Yellow Sea. These studies were presented as SC/62/NPM11 (microsatellite) and SC/62/NPM21 (mtDNA).

Recent progress in the development of stock structure hypotheses for western North Pacific common minke whale (O and J stocks) was reviewed, and a preliminary evaluation of these hypotheses was conducted in the context of the available scientific information, mainly genetics, presented and discussed at the IWC SC in recent years. The aim is to make a proposal of stock structure scenarios that is consistent with the data. A total of four hypotheses are considered consistent with the available scientific data. This review was presented as SC/62/NPM12.

Biological parameters

The preparation of ear plugs for age determination is ongoing for samples collected during 2004-2009 JARPN II surveys.

Other

In a co-operative study with Tokai University, molecular genetic analysis of MHC gene was conducted in order to develop microsatellite markers occurring within its region.

In a co-operative study with Korean scientists, development of SNPs (single nucleotide polymorphic) from common minke whales was started to apply them in future studies on stock identification of the species around Korean and Japanese waters.

Follow up of the JARPN II review workshop

Additional analyses in the field of feeding ecology and ecosystem, pollutant monitoring and stock structure were conducted and presented to the IWC SC meeting in 2009 (SC/61/JR1-9). These analyses were conducted in response to some recommendations from the JARPN II review workshop.

More recently Japanese scientists have discussed and summarized sub-objectives within the three broad objectives of the JARPN II. This is was one of the main recommendations from the JARPN II review workshop.

5. POLLUTION STUDIES

See item 4.4 above.

6. STATISTICS FOR LARGE CETACEANS

6.1 Corrections to earlier years' statistics for large whales

See the part of the NRIFSF in this report.

6.2 Direct catches of large whales (scientific permits) for the calendar year 2009 (North Pacific) and the season 2009/10 (Antarctic)

See the part of the NRIFSF in this report.

6.3 Anthropogenic mortality of large whales for the calendar year 2009 or the season 2009/10

6.3.1 Observed or reported ship strikes of large whales (including non-fatal events)

See the part of the NRIFSF in this report.

6.3.2 Fishery bycatch of large whales

See the part of the NRIFSF in this report.

7. STATISTICS FOR SMALL CETACEANS

The Government of Japan has a policy not to present information on small cetaceans in the progress report.

8. STRANDINGS

See the part of the NRIFSF in this report.

9. OTHER STUDIES AND ANALYSES

A total of 298 samples of whale products obtained from the Japanese retail market during September and October in 2009 were examined genetically (mtDNA control region sequencing analysis) for determining species identity.

January sea ice trend during the period of three IWC IDCR/SOWER circumpolar surveys (1978-2004) was investigated to understand reasons for differences between Antarctic minke whale abundance estimates (SC/62/IA4). Preparation of sea ice data for estimation of abundance of Antarctic minke whales within sea ice field is undergoing (SC/62/IA5).

Sequencing analysis at 486 base pairs of the control region of mtDNA was conducted for the sample of gray whales stranded on beach or bycaught on set net along the Japanese coast from 1995 to 2007 (n=6) and legally caught during the Chukotka aboriginal subsistence whaling in Russia in 2008 (n=7). The generated data was then analyzed in conjunction with those in Leduc *et al.* (2002) to better understand the genetic relationship of the western and eastern populations of gray whales at the wider geographic area. The results of the genetic study are presented in SC/62/BRG5.

A study on distribution of dwarf minke whales around the Antarctic Peninsula is being conducted in collaboration with Chilean scientists of the research center CEQUA.

Genetic analyses based on mtDNA control region sequences are being conducted on Bryde's whales from the eastern South Pacific and western South Atlantic in collaboration with Chilean (CEQUA) and Brazilian (ENSP) scientists.

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