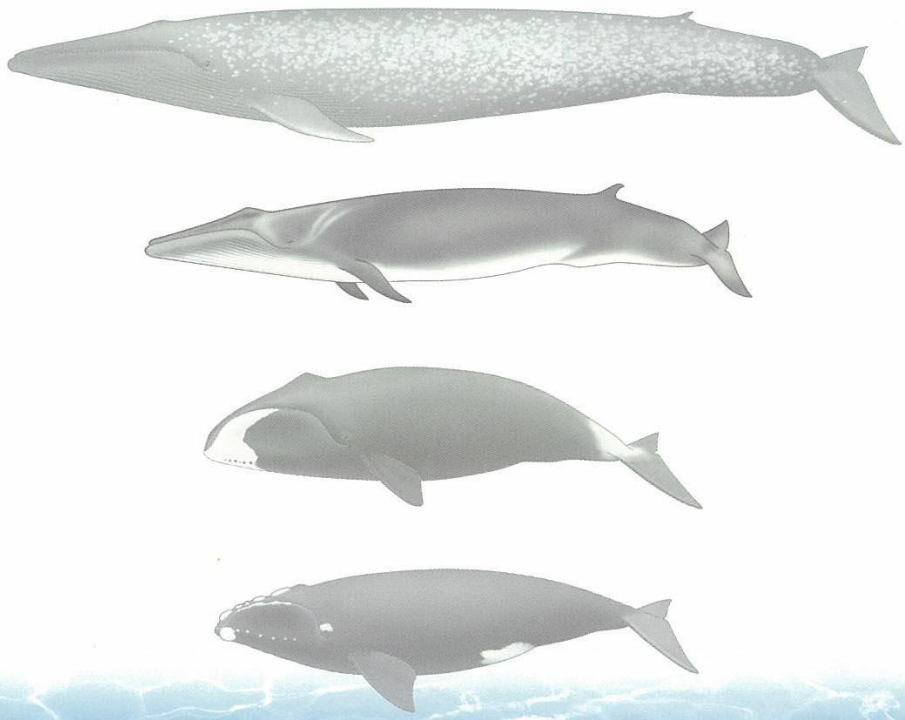
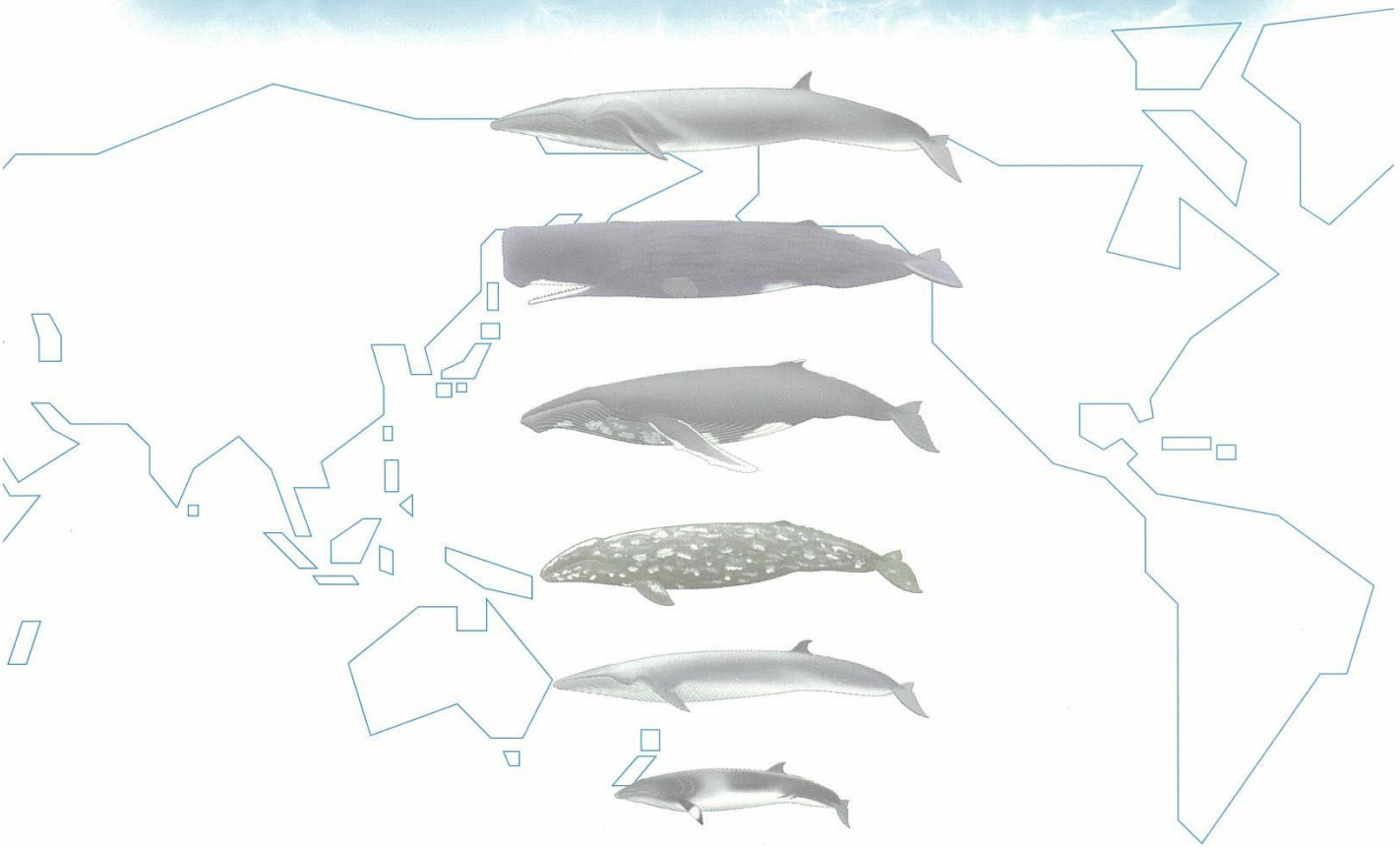


# Whales and Whaling



# Whale species

Whales are grouped as baleen whales (14 species) or toothed whales (70 species). Baleen whales have baleen plates in the upper jaws and two blowholes on the top of their heads. Toothed whales bear teeth and a single blowhole. Dolphins and porpoises are whales below 4 meters in length.

## Baleen whale examples

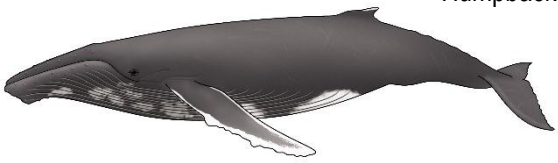
Blue whale

Bryde's whale

Fin whale

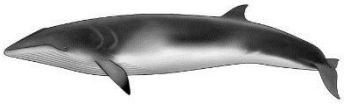
Sei whale

Humpback whale



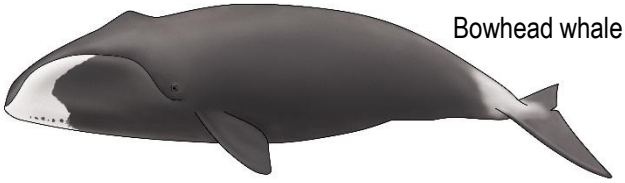
Minke whale

Antarctic minke whale



Gray whale

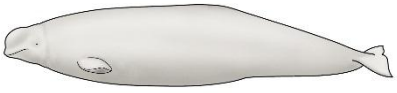
Bowhead whale



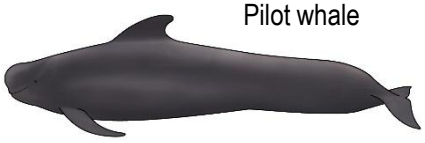
## Toothed whale examples

Sperm whale

Beluga



Pilot whale



Killer whale

Bottlenose dolphin

Baird's beaked whale

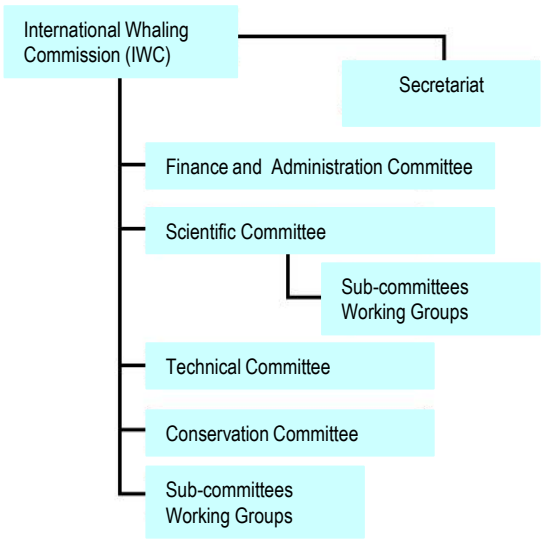
Origin of the term "kujira" (whale)

Although there is no definite etymology for the Japanese word for whale ("kujira"), according to one theory, since whales have big mouths, "kujira" was derived from the term "kuchihiro" (wide mouth). It is also said that in ancient Korean language, the particle "ku" meant big size, "shishi" indicated a beast or animal, and "ra" represented a postfix; the term "kushirara" shortened to "kujira". The kanji character representing "kujira" means big fish. Another term used in Japan for whale is "isana" and is usually written with the two kanji characters indicating "brave fish". In the Manyoshu, the oldest existing collection of Japanese poetry, the term "isanatori" (whale hunter) was used as a customary epithet in sea-related context. It is also said that the term "isana" has its origins in the ancient Korean language, meaning "big fish". Reference: Kujira to Nihon-jin (Seiji Ohsumi, Iwanami Shincho).

# What is the IWC?

The International Convention for the Regulation of Whaling (ICRW) was concluded in 1946. Its purpose was the conservation and management of whale resources and ensuring the sustainable use of whales as valuable marine resources for future generations. To realize this purpose, the International Whaling Commission (IWC) was founded in 1948 with the 15 main whaling countries of the world as members. Japan adhered to the IWC in 1951.

IWC Organization




## History of the whaling dispute

**Establishment (1948 to 1960)**

When the IWC began its work, resource management science was in an early stage. There was limited scientific data available, and catch quotas were not established other than those for the Antarctic Ocean.

**1960 to 1972**

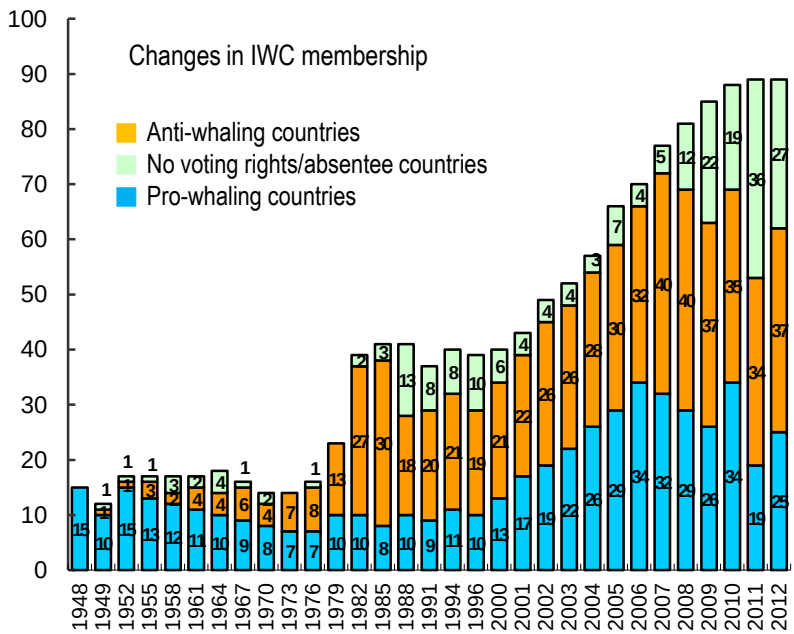
From 1960, resource management became strengthened with the establishment of catch quotas per country and capture prohibition of diminished species. As a result, major whaling countries, such as the US, UK, Netherlands and Australia, withdrew from their no longer profitable whaling industry. Instead, cries for animal protection and nature conservation began to be heard, and the anti-whaling movement increased in activity. A ten-year temporary suspension or moratorium on commercial whaling was adopted in 1972 at the United Nations Conference on the Human Environment, but it was rejected at the IWC as having insufficient scientific grounds.

**1972 to 1982**

1972 marked the beginning of serious antagonism between anti-whaling and pro-whaling countries. The anti-whaling countries contrived a strategy to obtain a majority of votes at the IWC, and by 1982, managed to convince 25 countries to join the IWC as anti-whaling members. As a result, they came to command a majority of more than 75%, and the IWC moratorium on commercial whaling was adopted that year.

**1982 to today**

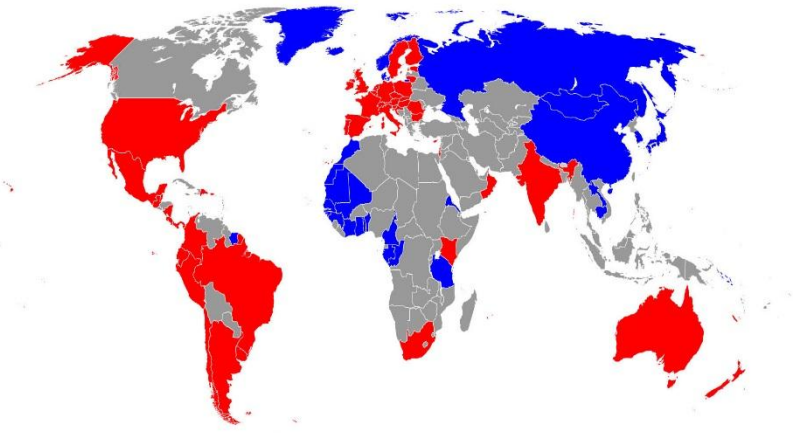
In 1982 ,the IWC adopted a moratorium on commercial whaling prohibiting the capture of great whales to take effect in March 1988. At present, the number of pro-sustainable use countries which includes Japan, and anti-whaling countries rival each other so that the three-quarter majority of votes necessary to abolish the moratorium has yet to be attained.




## Present IWC membership is 88 countries*

While the mandate of the IWC as a organization devoted to the management of whale resources based on scientific evidence is clearly stipulated in the ICRW, a number of countries continue to oppose the resumption of commercial whaling even for species whose resource status has been scientifically proven to be at high levels of abundance. However, some of these countries are starting to change their positions, and new participation from countries which support sustainable whaling has been increasing.

* As of December 2013



Pro-whaling/sustainable use (blue) 36 countries
Anti-whaling (red) 52 countries

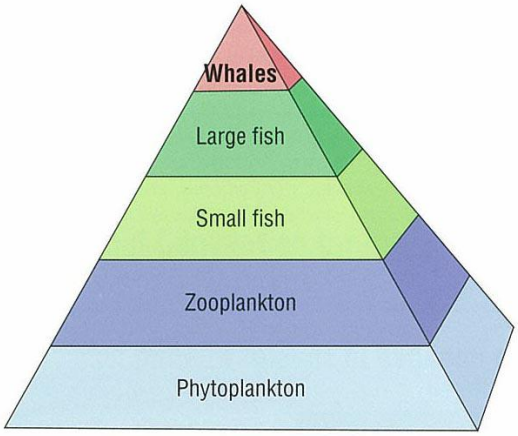
Note: Aboriginal subsistence whaling countries: United States of America, Russian Federation, Denmark, St. Vincent & the Grenadines
Commercial whaling countries: Norway, Iceland Research whaling country: Japan

# Importance of the ecosystem approach

## Marine ecosystem balance

The marine ecosystem food chain can be described in its simplest form as plankton eaten by fish and the fish eaten by whales. We can visualize this as a food pyramid in which the fewer top level organisms are supported by a larger number of food organisms. With the moratorium on commercial whaling protecting even abundant whale species, if their abundance continues to increase, the top layer alone of the food pyramid will expand, upsetting the balance of the marine ecosystem, since the fish available as food for so many whales would, by consequence, be reduced.
The sustainable utilization of a certain number of whales based on scientific evidence is therefore important in terms of maintaining the marine ecosystem balance.

Food pyramid conceptual diagram



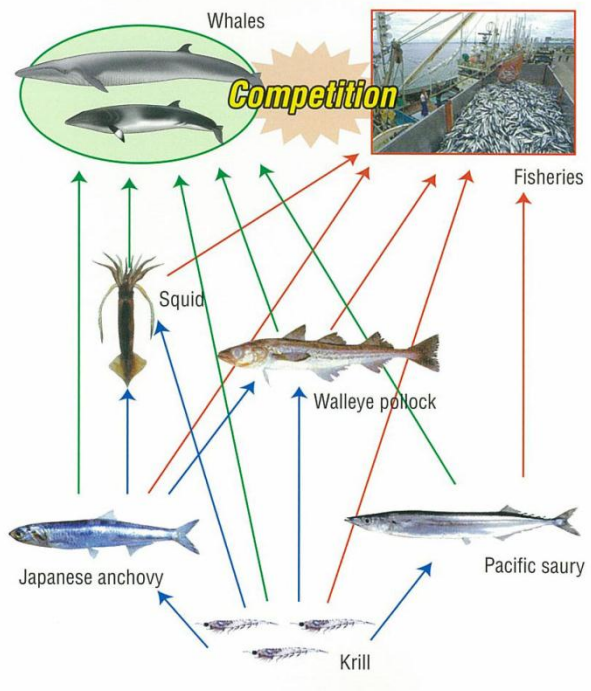

# Competition between whales and fisheries

## Elucidation of the possible competition between whales and fisheries

### Whales are at the top of the food web

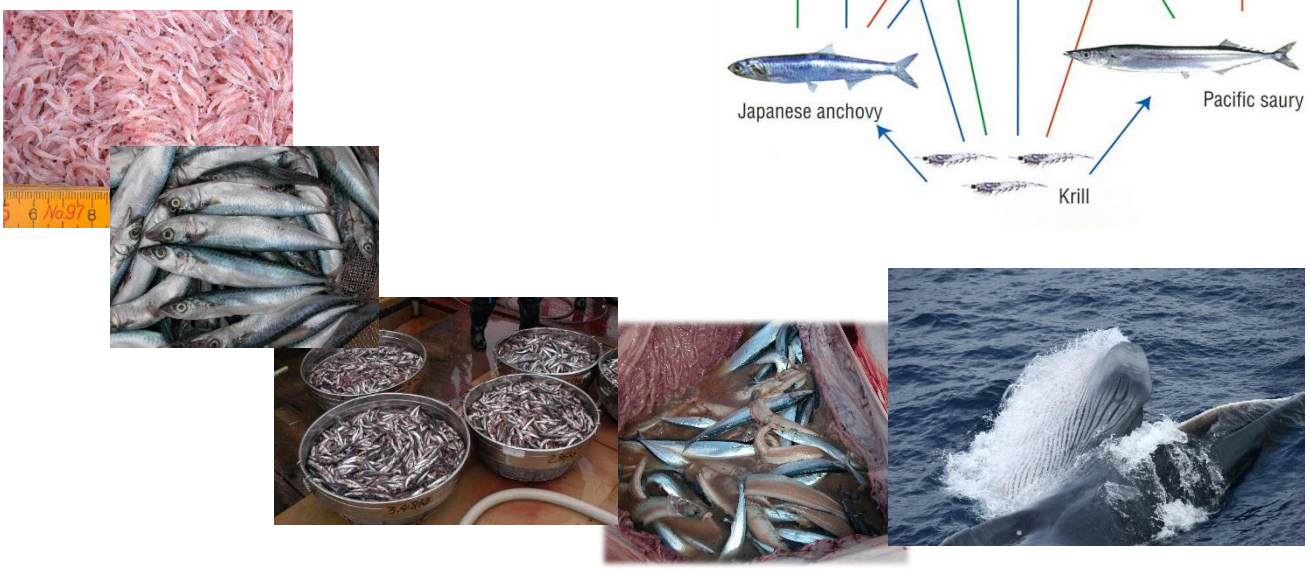
Whales are the largest marine mammals and are at the top of the food web in their ecosystem. The balance of the marine ecosystem will be affected if whales alone increase excessively in number.

Schematic diagram of competition in the western north Pacific




### Competition between whales and fisheries

The issue of competition between whales and fisheries (in the western north Pacific) implies the consumption by whales of important seafood species, such as Japanese anchovy, Pacific saury, walleye pollock, salmon and squid. As whales are increasing in number, their feeding behavior could severely affect fisheries, which poses a grave problem.



# Why does Japan conduct whale research?

## Starting background

Japan withdrew from commercial whaling in 1987 after the IWC moratorium adoption. The moratorium however was adopted with the provisory clause that "by 1990 at the latest, the Commission will undertake a 'comprehensive assessment' of the effects of this decision on whale stocks and consider modification of this provision and the establishment of other catch limits". From 1987/1988, Japan initiated the whale research program in the Antarctic and to this day, continues collecting the scientific data necessary for in-depth analyses of the IWC comprehensive assessment, aiming for its future application on the sustainable utilization of whale resources.

## The purpose

Japan's whale research has two main components lethal and non-lethal. The non-lethal component includes sighting surveys with the objective of collecting scientific data for abundance estimation, and the lethal component implies the capture and taking of whales with the objective of collecting biological data. In order for the IWC to undertake its "comprehensive assessment of whale stocks", in addition to the estimation of resource abundance based on sighting surveys, the collection of scientific data that can be obtained only through whale capture, such as resource age composition and breeding stocks, is also essential. The constant accumulation of this biological data will make it possible to forecast resource fluctuations with high accuracy, thus leading to the sustainable utilization of whale resources.

## The content

To achieve Japan's whale research objectives, we are studying whale resources from different angles such as the following.

Non-lethal research examples:
- Resource abundance (population estimate by visual observation)
- Stock distribution (tissue sampling and genetic analysis)

Lethal research examples:
- Stock structure (age composition by ear-plug analysis, etc.)
- Stock distribution (genetic analysis of tissue samples)
- Feeding ecology (stomach contents)

Examples of appraisals using resource data:
- Effect of water habitat environmental variation on resources
- Resource variation simulation using ecosystem models

## Japan's whale research is a legal right under international law

Under Article VIII of the International Convention for the Regulation of Whaling, IWC member countries have the right to conduct research programs involving the capture of whales for scientific purposes. Even if commercial whaling is banned by the moratorium, IWC member countries are legally allowed to carry out research whaling. Article VIII also stipulates that the research by-products (whale meat) must be used as much as practicable.

### Article VIII, International Convention for the Regulation of Whaling

1. Notwithstanding anything contained in this Convention, any Contracting Government may grant to any of its nationals a special permit authorizing that national to kill, take, and treat whales for purposes of scientific research subject to such restrictions as to number and subject to such other conditions as the Contracting Government thinks fit, and the killing, taking, and treating of whales in accordance with the provisions of this Article shall be exempt from the operation of this Convention. Each Contracting Government shall report at once to the Commission all such authorizations which it has granted. Each Contracting Government may at any time revoke any such special permit which it has granted.
2. Any whales taken under these special permits shall so far as practicable be processed, and the proceeds shall be dealt with in accordance with the directions issued by the Government by which the permit was granted.

To read the full text of the ICRW visit: http://iwc.int/convention

# How is decided what research method is best?

## Lethal and non-lethal research method choice

There are two kinds of methods employed in whale research. One implies the killing of whales (lethal method) while the other (non-lethal method) does not. Data collection effectiveness and suitability with respect to each research objective as well as the possibilities to obtain sufficient data are carefully considered to decide which method is best to apply.
The table below shows a comparison between the lethal and non-lethal methods' data collection effectiveness.

Suitability of lethal and non-lethal research methods according to research item and objective

| Research item (Research objective) | Lethal method / Non-lethal method | Allows collection of data? | Allows collection of plenty enough data? |
|---|---|---|---|
| Age determination (To understand age composition, age at maturity, recruitment rate) | Earplug analysis | ✔ | ✔ |
| | Negative | No | No |
| Blubber thickness and other biological condition indicators (To understand feeding ecology) | Blubber thickness analysis | ✔ | ✔ |
| | Negative | No | No |
| Stomach content qualitative analysis (To understand feeding ecology) | Stomach content analysis | ✔ | ✔ |
| | Fecal matter | ✔ | **No** |
| Stomach content quantitative analysis (To understand feeding ecology) | Stomach content analysis | ✔ | ✔ |
| | Negative | No | No |
| Genetic analysis (To understand stock structure and mixing degree) | Tissue analysis | ✔ | ✔ |
| | Biopsy (skin sample) | ✔ | **No** |
| Pollutant and internal organ observation (To understand effects of environmental pollution) | Internal organ/tissue analysis | ✔ | ✔ |
| | Biopsy (skin sample) | ✔ | **No** |
| Number of individuals (To estimate resource abundance) | Negative | No | No |
| | Visual counting | ✔ | ✔ |
| Migration, behavior, habitat preference (To understand behavioral ecology) ) | Tag recovery | ✔ | **No** |
| | Satellite tagging | ✔ | **No** |

# Japan's whale research in the Antarctic

## JARPA (1987/88 - 2004/05)

**Japan's Whale Research Program under Special Permit in the Antarctic (JARPA)**

The IWC moratorium on commercial whaling was introduced because of the uncertainty surrounding the scientific data then available. Japan's Whale Research Program under Special Permit in the Antarctic was started in order to address this matter, and to accumulate scientific data on the abundant Antarctic minke whale resources.

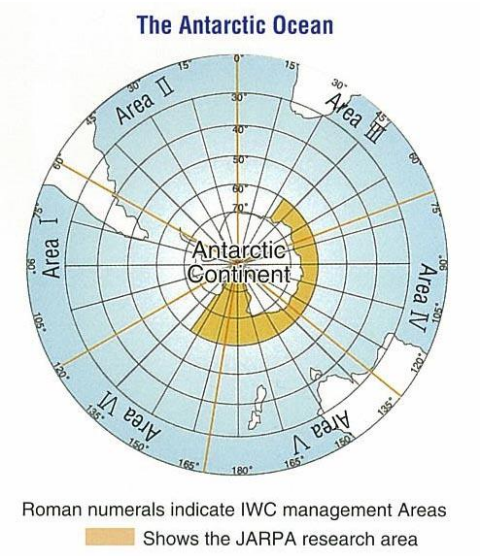
## JARPA II (2005/06-)

**The Second Phase of Japan's Whale Research Program under Special Permit in the Antarctic (JARPA II)**

To be able to conduct future resource estimates, first, it is necessary to understand the population dynamics of baleen whales in a specific sea area. To do so, resource analysis of individual whale species is not only necessary, but we need at the same time to take into account the whale inter-species relationship in the ecosystem of said sea area.

The JARPAII program started in 2005 with the Antarctic minke whale, the fin whale and the humpback whale as research target species. The results will be reviewed every six years, and the first review meeting by the IWC Scientific Committee was held on February 2014 in Tokyo.

Concerning the humpback whale, in 2007 the United States, which at the time was the IWC Chair, made a request for the suspension of sampling of this species. Japan, in the interest of bringing about a more forward atmosphere in negotiations with an aim to put an end to the deadlock situation reigning at the IWC (the "Future of the IWC" process), decided to put off for the time being the sampling of this species.




## Objectives

1) Monitoring of the Antarctic ecosystem
2) Modeling whale inter-species competition
3) Elucidation of temporal and spatial changes in stock structure
4) Improving the management procedure for the Antarctic minke whale stocks

## Research area

Of the six IWC Antarctic management areas, the eastern part of Area III, Area IV, Area V and a part of western part of Area VI (South of 60 S, 35 E - 145 E) are used for research. Cruises are conducted alternately on each half so two years are required to survey the whole

## Planned number of samples

850 ±10% Antarctic minke whale
50 fin whales
50 humpback whales

## Main research organization

The Institute of Cetacean Research

### Safety at Sea Legal Action against Sea Shepherd and Paul Watson

On December 2011, the Institute of Cetacean Research and Kyodo Senpaku filed their original complaint to the U.S. District of Washington Federal Court seeking preliminary injunctive relief to protect their research vessels and crews against violent and unlawful attacks by Sea Shepherd and Paul Watson. On March 2012, the District court issued a ruling that rejected the preliminary injunction requested by the Institute of Cetacean Research and Kyodo Senpaku. After appealing to the U.S. 9th Circuit Court of Appeals, in February 2013, the 9th Circuit reversed the Washington District Court's original ruling on all counts and issued an Order enjoining Sea Shepherd, Paul Watson and anyone acting in concert with them from physically attacking the Japanese research vessels and ordered an appointment of another judge by the District Court for the case. At present, the case is pending in court..

# Japan's whale research in the Western North Pacific

## JARPN (1994 - 1999)

**Japan's Whale Research Program under Special Permit in the Western North Pacific (JARPN)**
In the IWC discussions to establish catch quotas of minke whales in the seas off Japan, the anti-whaling countries claimed that there were numerous stocks (small breeding groups within the same whale species) of minke whales in the Western North Pacific, aiming to complicate the calculations in a way that would produce lower quotas. The JARPN research program was created to disprove this theory.

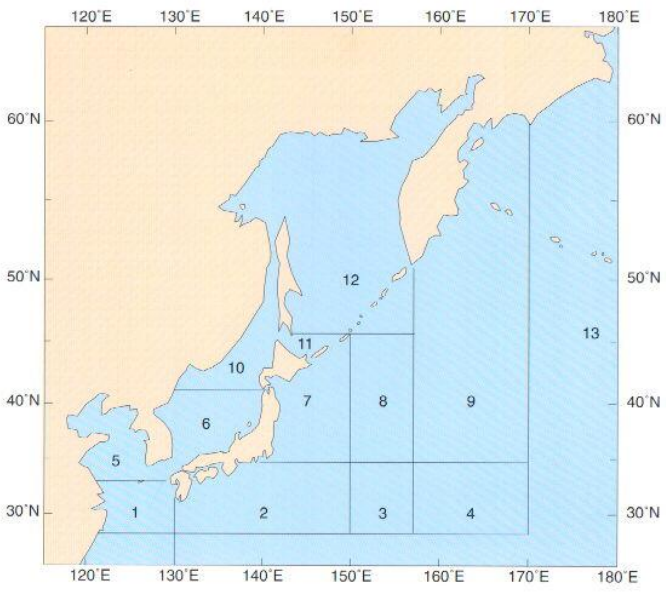
## JARPN II ( 2000 - )

**The Second Phase of Japan's Whale Research Program under Special Permit in the Western North Pacific (JARPN II)**
The first phase of the program demonstrated that the theory of the Japanese scientists which stated that "in the western north Pacific, there are only two minke whale stocks" was correct. JARPN also revealed that minke whales consume huge amounts of fishery resources. Thus, JARPN II was planned to further elucidate the feeding ecology of the various whale species aiming for the comprehensive management of the marine ecosytem.

## Objectives

1) Feeding ecology and role of whales in the ecosystem
2) Monitoring pollutants in whales and the marine ecosystem
3) Elucidation of whale stock structure

JARPN II research area




## Research area

Of the thirteen Sub-areas established by the IWC Scientific Committee, Sub-areas 7, 8 and 9 are used for research.

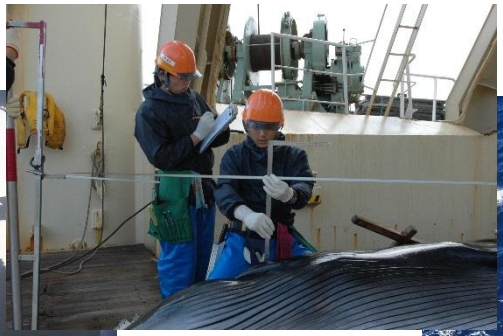
## Planned number of samples

220 minke whales
100 sei whales
50 Bryde's whales
10 sperm whales

## Main research organizations

The Institute of Cetacean Research
National Research Institute of Far Seas Fisheries, Fisheries Research Agency
Association for Community-Based Whaling

Sighting survey



Whale body measurements

A sperm whale pod

# IWC/Japan joint Pacific Ocean whale and ecosystem research program

The IWC/Japan joint Pacific Ocean whale and ecosystem research program (IWC -POWER) is a cetacean sighting survey program being carried out collaboratively by the IWC and Japan since 2010. IWC-POWER applies the know-how and expertise acquired during the International Whaling Commission-Southern Ocean Whale and Ecosystem Research (IWC-SOWER) program executed from 1996, ending in 2010. The IWC-POWER content reflects the major research agenda of the IWC Scientific Committee. During the first three cruises, a large number of fin, sei and humpback whales were observed in the research area, where a large scale sighting survey had not been conducted for more than half a century.

The IWC-SOWER program made a huge contribution to elucidating abundance trends of whale stocks, including the Antarctic minke whale. It is recognized as the most successful international collaborative research effort conducted under the auspices of the IWC. Japan has made and continues to make a substantive contribution to conducting and operating these international whale research programs by providing research vessels and crew members from beginning to end.

## Objectives

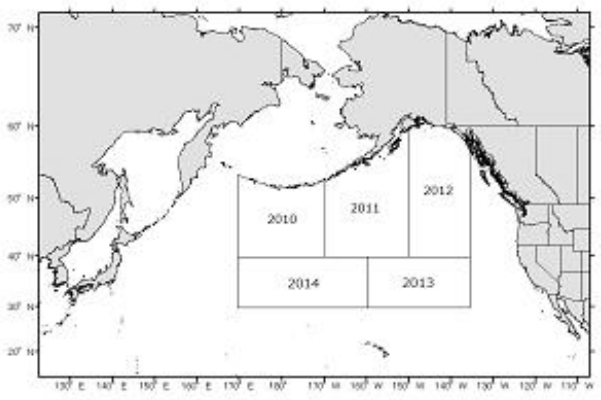
1) Estimation of sei whale abundance (and other species where possible, especially fin whales)

2) Collection of information on stock structure, particularly biopsy samples, with priority given to sei, fin and sperm whales

3) Collection of photo-identification data and biopsy samples for rare species encountered, especially North Pacific right whales and blue whales

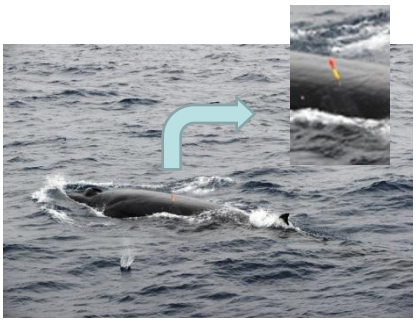
## International researchers

| Year | Cruise leader | Researchers |
|---|---|---|
| 2010 | 1 (Japan) | 3 (USA, South Korea, Japan) |
| 2011 | 1 (Japan) | 1 (USA) |
| 2012 | 1 (Japan) | 3 (USA, South Korea, Japan) |
| 2013 | 1 (Japan) | 3 (Mexico, South Korea, Japan) |



IWC-POWER research area


Blue whale


Sei whale biopsy sample collection


Killer whale biopsy sample collection


Fin whale cow and calf. The white right side jaw is characteristic of the species.


Humpback whale breaching at the upper Gulf of Alaska.

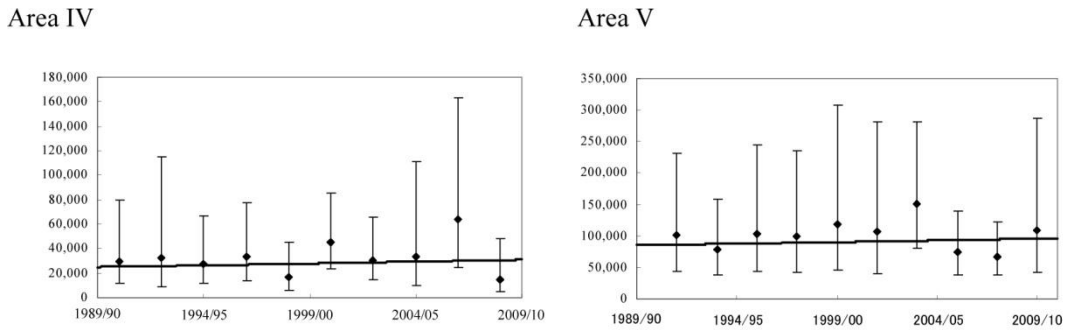

North Pacific right whale observed off Kodiak Island

# Things revealed by Japan's whale research in the Antarctic

## Antarctic ecosystem changes made clear by research whaling

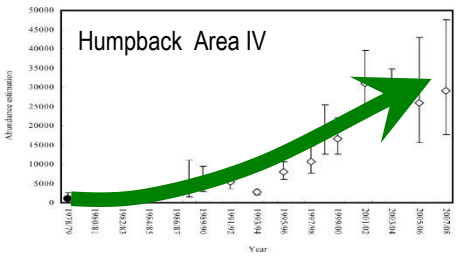
### 1. Baleen whales reduced by early 20th century commercial whaling are recovering

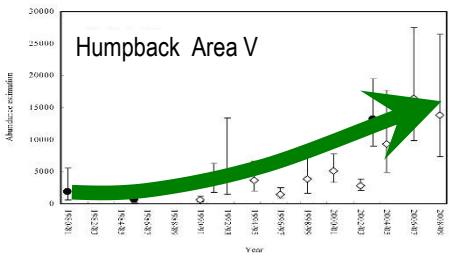
The abundance of the Antarctic minke whale, the main target species of whale research, largely increased from the 1940s to the 1970s. Results from 1992 to 2004 Japan's whale research made possible for the IWC to estimate Antarctic minke whale abundance as 515,000. Further, no big variation in abundance has been observed during the research period. In other words, the Antarctic minke whale abundance is consistently high.



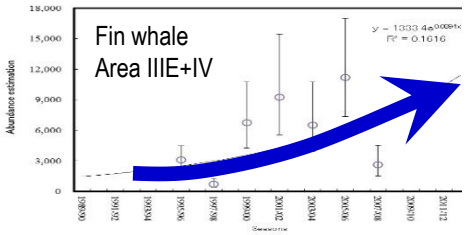

The figure above shows the Antarctic minke whale abundance trend in research Areas IV and V. The vertical lines indicate abundance estimate 95% confidence interval.

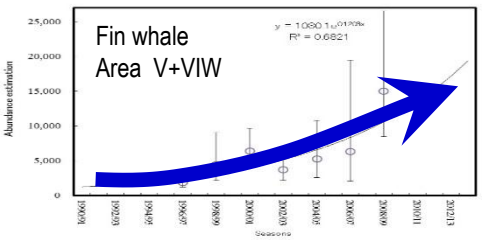
Humpback and fin whale resources deteriorated due to commercial whaling but since 1990 they are showing an increasing recovery trend. On the other hand, Japan's whale research results show that, owing to the humpback and fin whale recovery, the Antarctic minke whale distribution is shifting southward.



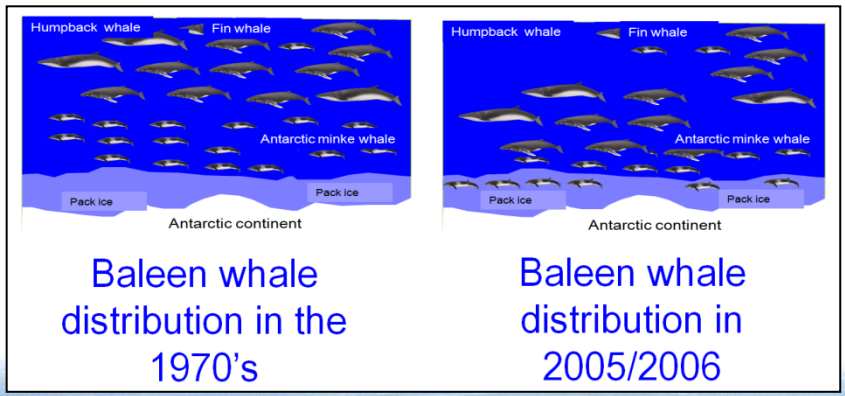




Humpback whale:
The left figure shows yearly research abundance estimates for humpback whale. Vertical lines indicate abundance estimation 95% confidence interval. Estimated abundance trend is rising to the right in both research Areas IV and V. From 1989 to 2009 the estimated abundance annual increase rate was 13.6% in Area IV and 14.5% in Area V.



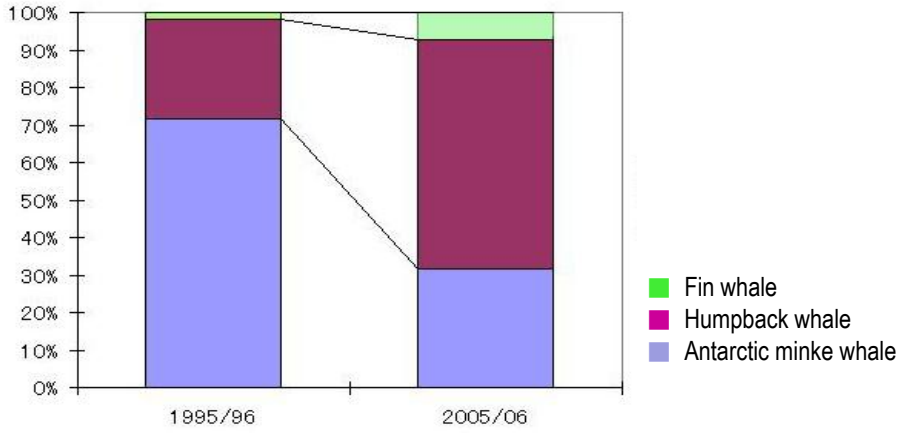

Fin whale:
The left figure shows yearly research abundance estimates for fin whale. Vertical lines indicate abundance estimation 95% confidence interval. Estimated abundance trend is rising to the right in both research Areas IIIE+IV and V+VIW. From 1995 to 2009 the estimated abundance annual increase rate was 8.9% in Area IIIE+IV and 12.0% in Area V+VIW.

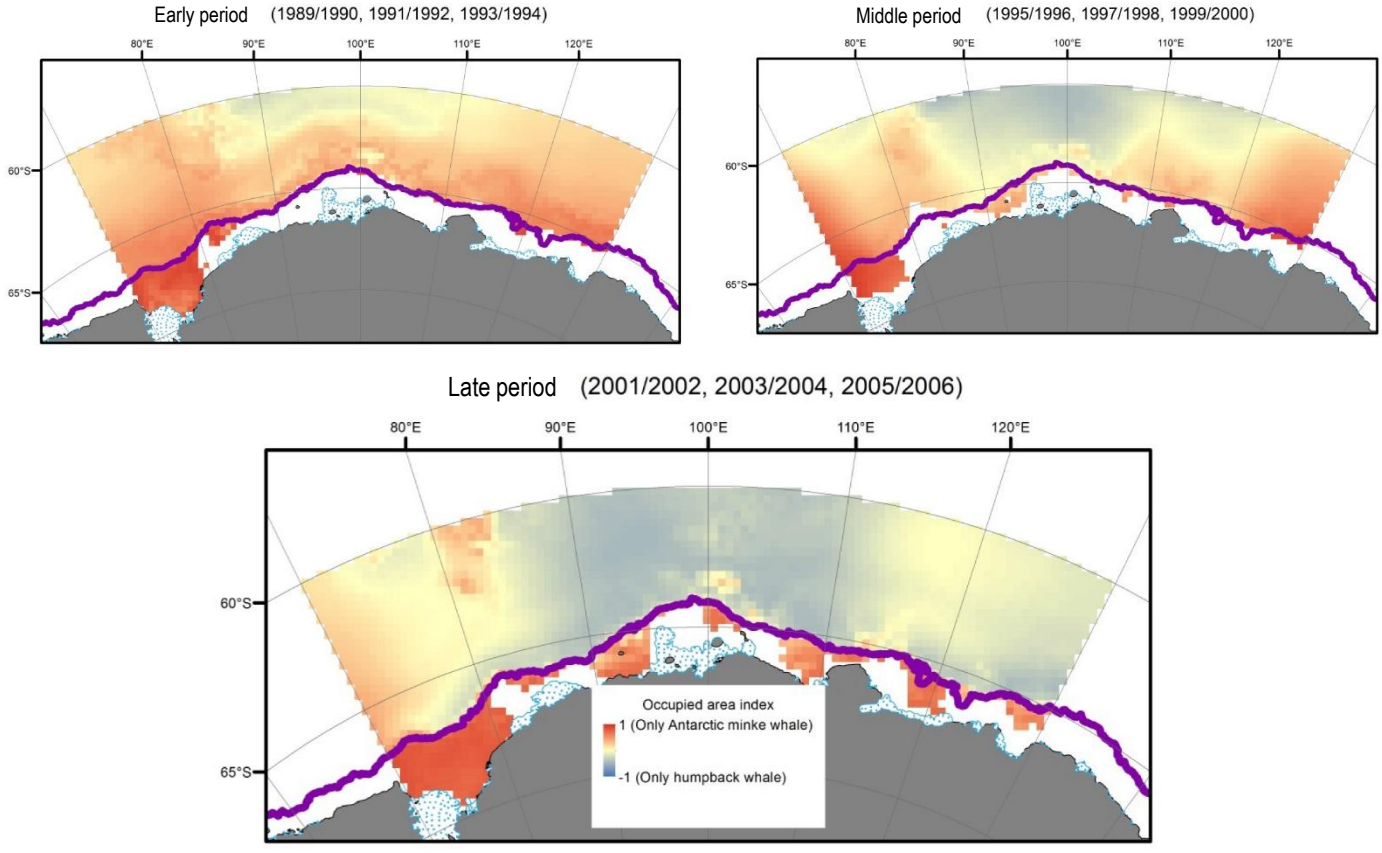


# Findings from Japan's whale research in the Antarctic

## 2. Changes in Antarctic large whale species composition during the JARPA/JARPAII research period

The distribution range of humpback whales in research Area IV enlarged from 1989 to 2006, but the Antarctic minke whale distribution did not change over the same period and area. The number of humpback whale sightings was highest in Area IV while in Area V, humpback whales were second to Antarctic minke whales with regards to the number of sightings.




Occupied area indices of Antarctic minke and humpback whales in research Area IV in early (1989 to 1994), middle (1995 to 2000) and late (2001 to 2006) periods. If the index was 1 (red), only Antarctic minke whales were present in a unit area while only humpback whales were present if the index was -1 (blue). If the index was 0 (cream), probabilites of the presence of Antarctic and humpback whales in a unit area were identical.

(Murase,H., Matsuoka, K., Hakamada, T and Kitakado, T. Preliminary analysis of changes in spatial distribution of Antarctic minke and humpback whales in Area IV during the period of JARPA and JARPAII from 1989 to 2006. SC/F14/J18)

# Findings from Japan's whale research in the Antarctic

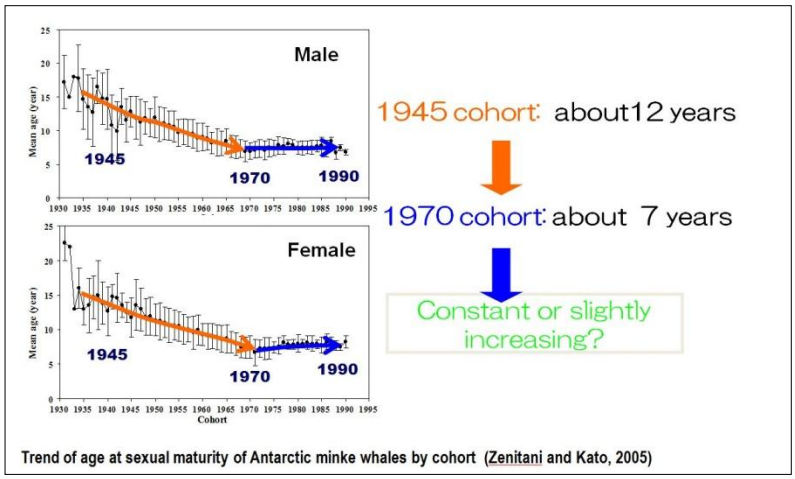
## 3. Antarctic minke whale changes

### Stock abundance is almost constant

The Antarctic minke whale abundance showed no major change and has been almost constant throughout the whole JARPA II research area (IIIE to VIW areas) during the research period.

### Change in sexual maturity

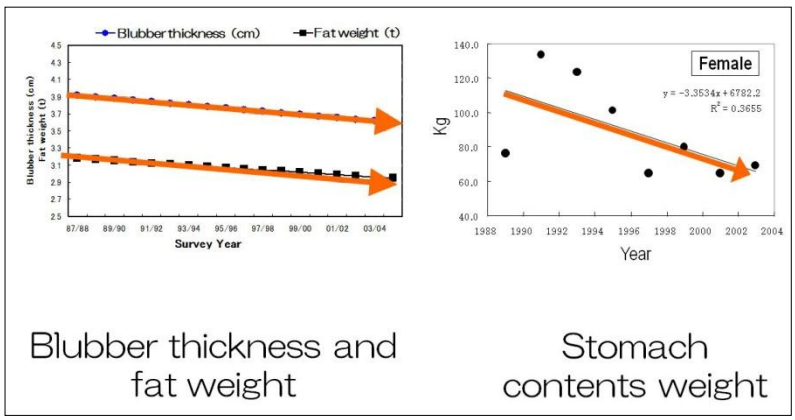
The Antarctic minke whale age at sexual maturity was about 12 years around 1945 but declined to 7 years by 1970 and has been constant or very slightly increasing since then. It is thought that this age at sexual maturity decline may be due to an increased growth speed. One of the causes of an increase in the Antarctic minke whale growth speed may be the rise in food (krill) availability resulting from the reduction of great baleen whale stocks by commercial whaling. However, in recent years, the abundance of some of these great whale species has increased too, so the food environment most favorable to the Antarctic minke whale may have already elapsed and may be now gradually deteriorating.




Trend of age at sexual maturity of Antarctic minke whales by cohort (Zenitani and Kato, 2005)

### Whale nutrition index downturn

The thickness of the Antarctic minke whale blubber (a layer of fat under the skin where energy is stored) has been decreasing. The mean stomach content weight of whales in the offshore sea areas has been decreasing too. Further, the individual daily food intake has dropped as well, regardless of the whale's sex (male or female) and maturity/immaturity state. However, in sea areas where humpback whales are not distributed, such as the Ross Sea, the stomach content weight of (female) Antarctic minke whales has not decreased.

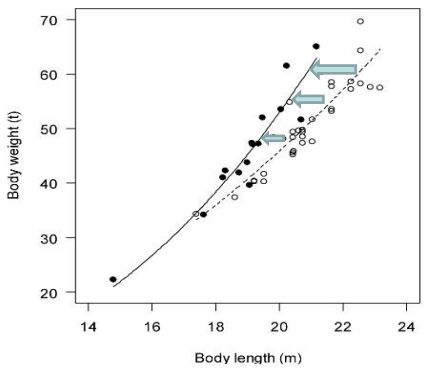



## 4. Fin whale changes

The data suggests that since commercial whaling times, the fin whale age at sexual maturity has been decreasing. Also, the body weight of fin whales taken during research whaling has increased compared to relative body lengths from the 1950s reports. These changes may be an indication of improved nutrition condition. Further, in the research area east side (V and VIW areas), a remarkable increase in fin whale population abundance was confirmed.

## 5. Environmental fluctuation

A decrease in sea ice due to the effect of global warming has not been detected in the research sea area. Pollutant and marine debris analysis show that the Antarctic Ocean environment supports one of the cleanest ecosystems of the world.




Fin whale body length and body weight relationship. Black dots and solid line show research whaling data while white dots and dotted line represent data from commercial whaling.

(Mogoe, T., Bando, T., Maeda, H., Kato, H and Ohsumi, S.. Biological observations of fin whales sampled by JARPAII in the Antarctic. SC/F14/J10)

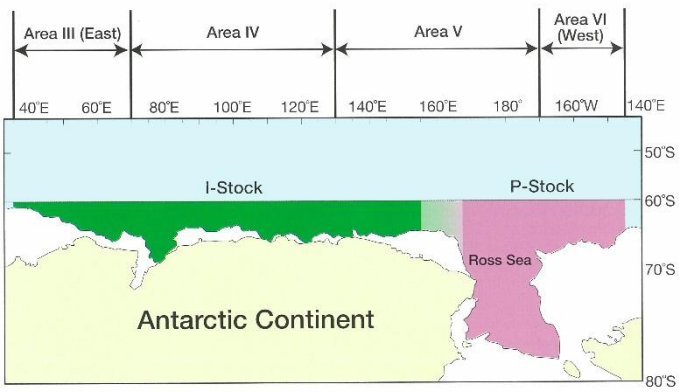
# Findings from Japan's whale research in the Antarctic

## Contribution to new management of whale resources

### 1. Antarctic minke whale stock structure

From DNA sequence and other data analysis, we now know that (1) there are two separate Antarctic minke whale stocks (I-stock and P-stock) distributing east and west in the research area; (2) the sea area where both stocks distribution overlaps broadens from the Area IV east side to the Area V west side and the boundary location changes from year to year; and (3) the stock distribution boundary may change depending on sex (male or female).
Besides the Antarctic minke whale, other findings include: humpback whale resources are increasing, segregation by whale species and their growth stages, and their extremely broad range of movement.

Antarctic minke whale stock structure hypothesis




### 2. Fin, humpback and southern right whale stock structure

Through genetic analysis, we have made advances in understanding the stock structure of three other baleen whale species, besides the Antarctic minke whale. For example, the distribution range of the humpback D-stock (western Australia) and E-stock (eastern Australia, New Caledonia, Tonga) has been analyzed in detail so that now it has become clear there are sea areas where only a single stock is distributing while in another area, the range of both stocks overlaps.

### 3. Suitability of IWC management areas

From the results of genetic and non-genetic analysis, it has become clear that (1) the distribution of individual Antarctic minke whale stocks does not match with the current management areas set by the IWC, (2) for humpback and fin whales, separate stocks within the current management Areas III, IV, V and VI do match with the IWC management areas; and (3) that within the research area, the southern right whale movements are mainly concentrated within Area IV.

### 4. Whale resource dynamics model and biological parameters

For sustainable utilization of resources, stock reduction due to capture and other factors and their natural increment must be balanced in a way that the number of captures exerts only a minimal change on the resource without affecting abundance.
Factors that may affect resource abundance, include human capture, mortality within the natural life cycle (due to predators, disease, starvation, stranding) and the recruitment of new generations through reproduction. The study of all these factors is of utmost importance for the management of whale resources.
Biological parameters such as the natural mortality index, recruitment rate, and pregnancy rate are pieces of information extremely important and necessary to understand the population dynamics of whales.

Conclusions up to now

**The Antarctic ecosystem is undergoing big changes**

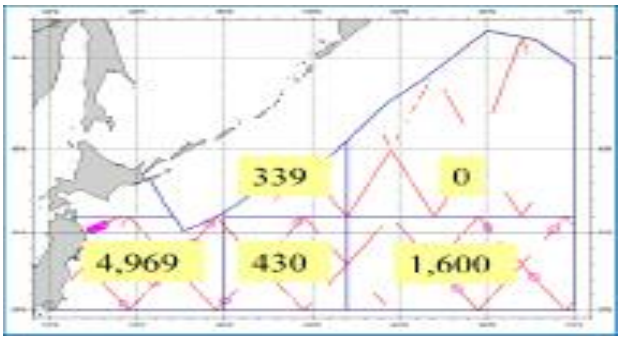
The findings introduced here are the result of Japan's long-term and comprehensive research effort. Japan's whale research combines both lethal and non-lethal components that allow us to obtain data from a wide range of research fields. The combined and comprehensive analysis of this data makes it possible to better understand the Antarctic marine ecosystem. As we know now that the Antarctic ecosystem is undergoing big changes, its monitoring through systematic and continuous research becomes all the more necessary in order to achieve the conservation and management of marine living resources.

# Findings from Japan's whale research in the Western north Pacific

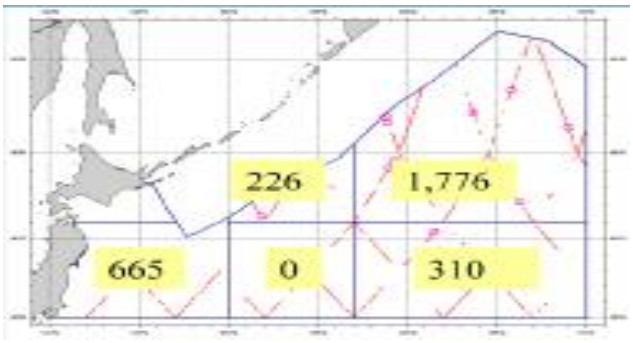
## Number of whales distributing

A large number of minke whales is present during the months of May to June. In the following months (July to August), they migrate northward moving to the Okhotsk Sea. The numbers in yellow in the respective sea areas below indicate the number of whales distributing at a certain time and in a specific sea area. They do not indicate stock abundance.
Similar estimations have been calculated for Bryde's and fin whales. The data concerning the number of whales distributing is used to estimate the amount of fish resources consumed by whales in the JARPNII research area.

Minke whales in offshore waters



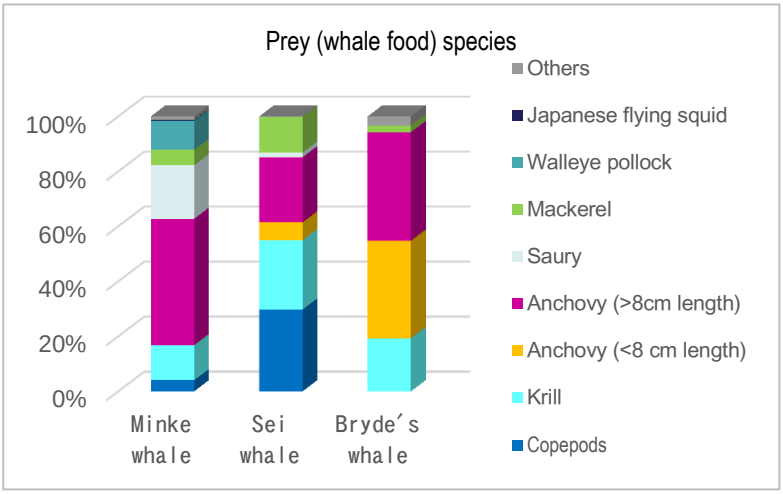

May to June: 7,338 whales distributing




July to August: 2,976 whales distributing

## Assessment of feeding by whales

Whales feed on a wide range of fishery resource organisms ,including copepods, krill, anchovy, Pacific saury, mackerel, walleye pollock and Japanese flying squid. From JARPAII data ,it was estimated that from May to September ,minke whales consume 150,000 tons, sei whales 900,000 tons, and Bryde's whales consume 530,000 tons of food organisms.
Even within the same whale species, depending on the sea area and season, the type of food organism they consume changes. Further, we know now that prey type may change depending on the year. The kind of food organism they feed on also varies depending on whale species.




(Tamura, T., Konishi, K., Isoda, T., Okamoto, R and Bando, T. Prey consumption and feeding habits of common minke, sei and Bryde's whales in the western North Pacific . SC/J09/JR16)

Minke whale stomach containing Pacific pomfret and salmon

Minke whale stomach containing squids

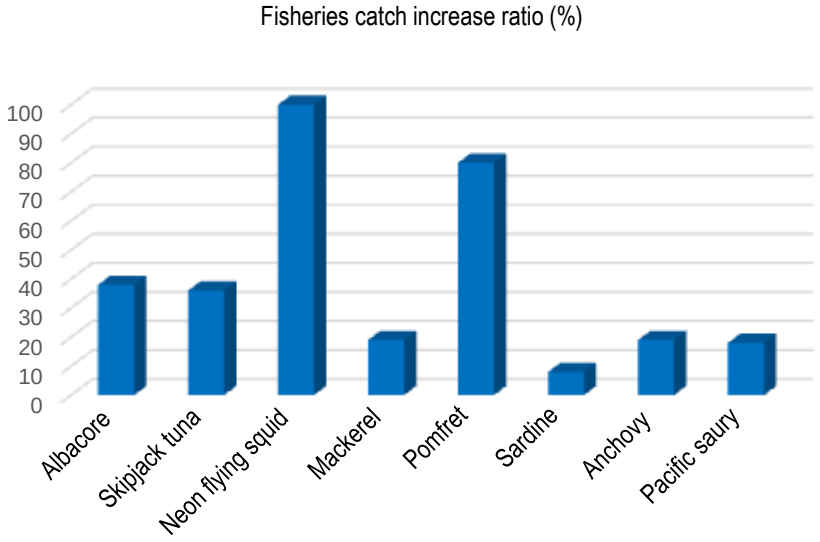
Sei whale stomach contents (Pacific saury)

Bryde's whale stomach containing anchovies

# Findings from Japan's whale research in the Western north Pacific

## Fisheries output change and whaling

As an example of data application in ecosystem modelling, let's assume that 4% of minke, sei and Bryde's whales' stocks were taken during a 50 year period. As the right figure shows, the results indicate that fisheries catches for species, such as anchovy, mackerel and skipjack tuna, would increase.

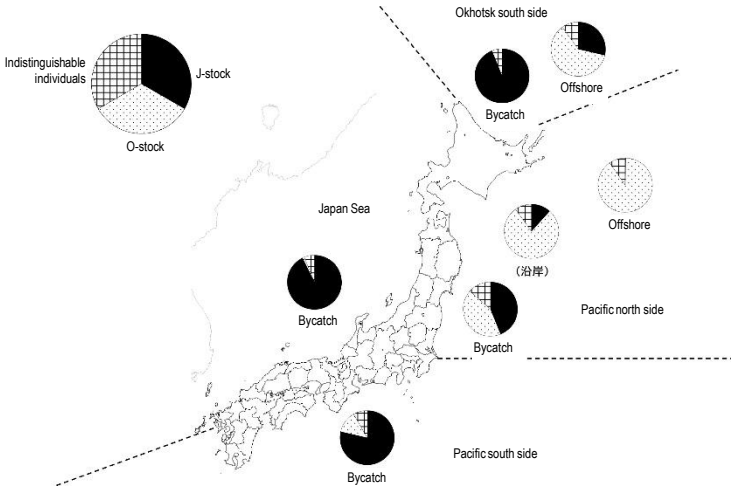



## Stock structure elucidation

Genetic analysis of samples taken in the research program showed that minke whales in sub-areas 7, 8 and 9 belong to the same genetic group which is entirely different from the stock distributed in the Japan Sea. The results indicate that there are two different stocks of minke whales, one in the Pacific side (O stock) and another in the Japan Sea (J stock).

Further to the minke whale samples collected during the research program, the analysis of genetic data collected from minke whale coastal bycatch events across Japan, has now clarified that both J and O stocks actually mix in the Pacific coastal area, and it is helping us better understand their distribution situation along the Japanese coast.

* By-catch or incidental capture is when a marine mammal or other organism is unintentionally caught while fishing for a specific target species. The DNA registry of whales captured incidentally in fixed nets along the coast of Japan is obligatory. Tissue samples of such whales are compulsorily sent to the Institute of Cetacean Research for their DNA analysis and registration.




Distribution pattern of individual whales identified as belonging to either O-stock or to J-stock (circle shades indicate ratio)

Note: The white-checked shadow indicates indistinguishable individuals, i.e. individuals that could not be identified as belonging to either O-stock or to J-stock because their analysis did not include a complete identification marker.

## Conclusions up to now

### Future contributions to ecosystem model-based management of marine living resources including whales

- Whales prey on a number of other fisheries species consuming amounts large enough to majorly impact those resources. Whale abundance (number of individuals) and their amount of prey consumption are utilized as ecosystem model data. Calculations using these ecosystem models have already produced preliminary results. Obtaining such information which is useful to understand the ecosystem structure will make it possible for further improvement of the ecosystem models thus facilitating the availability of new information necessary for ecosystem-based management of fishery resources that are also whale prey species.
- The research program continues to monitor contaminants through pollutant studies on western north Pacific whales, prey species and environmental samples. These studies will contribute to future projections on pollutants in this sea area.
- The existence of two distinct minke whale genetic groups, the J-stock and the O-stock, is one piece of important information obtained through this research program.

# Number of whales captured in whale research

Japan's whale research includes the capture of a number of whales in order to collect valuable scientific data. This number of whales is the minimum required for obtaining useful data and has no negative effect on the abundance of the whale species being studied.

Japan's whale research annual sample number is 100 sei whales, 50 Bryde's whales, 220 minke whales and 10 sperm whales in the western north Pacific and 850 Antarctic minke whales and 50 sperm whales in the Antarctic Ocean. These sample numbers have been calculated through statistical methods as the minimum required to obtain scientific data that may allow elucidation of different research objectives.

Further, the current abundance estimates for the whale research target species are as follows: Sei whale 21,612; Bryde's whale 20,501; minke whale 25,000; sperm whale 102,112; Antarctic minke whale 515,000; fin whale 11,755 (see table below).

In other words, Japan's whale research captures represent only 0.01% to 0.52% of the respective resource. Aiming for the sustainable utilization of whale resources, Japan's whale research capture levels are kept at the necessary minimum. As the data below clearly shows, the number of whales sampled has no negative effect on each resource species.

| Species | Distributing area | Abundance | Sample number | Ratio |
|---|---|---|---|---|
| Sei whale | Western north Pacific | 21,612 | 100 | 0.46% |
| Bryde's whale | Western north Pacific | 20,501 | 50 | 0.24% |
| Minke whale | Western north Pacific | 25,000 | 220 | 0.88% |
| Sperm whale | Western north Pacific | 102,112 | 10 | 0.01% |
| Antarctic minke whale | Southern Hemisphere | 515,000 | 850 | 0.17% |
| Fin whale | Southern Hemisphere | 11,755 | 50 | 0.43% |

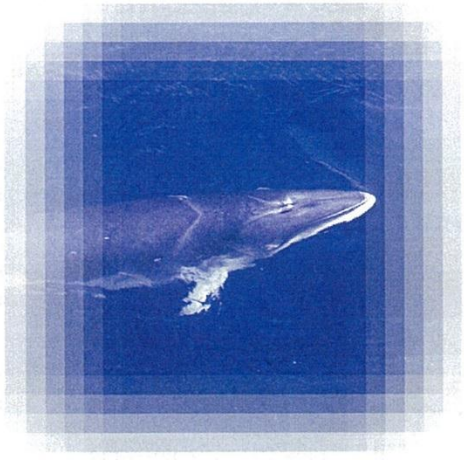
For more detail about sample size calculation see:
SC/57/O1 Plan for the Second Phase of the Japanese Whale Research Program under Special Permit in the Antarctic (JARPA II) http://www.icrwhale.org/ResearchPlan.html

# The Revised Management Procedure (RMP) and the Revised Management Scheme (RMS)

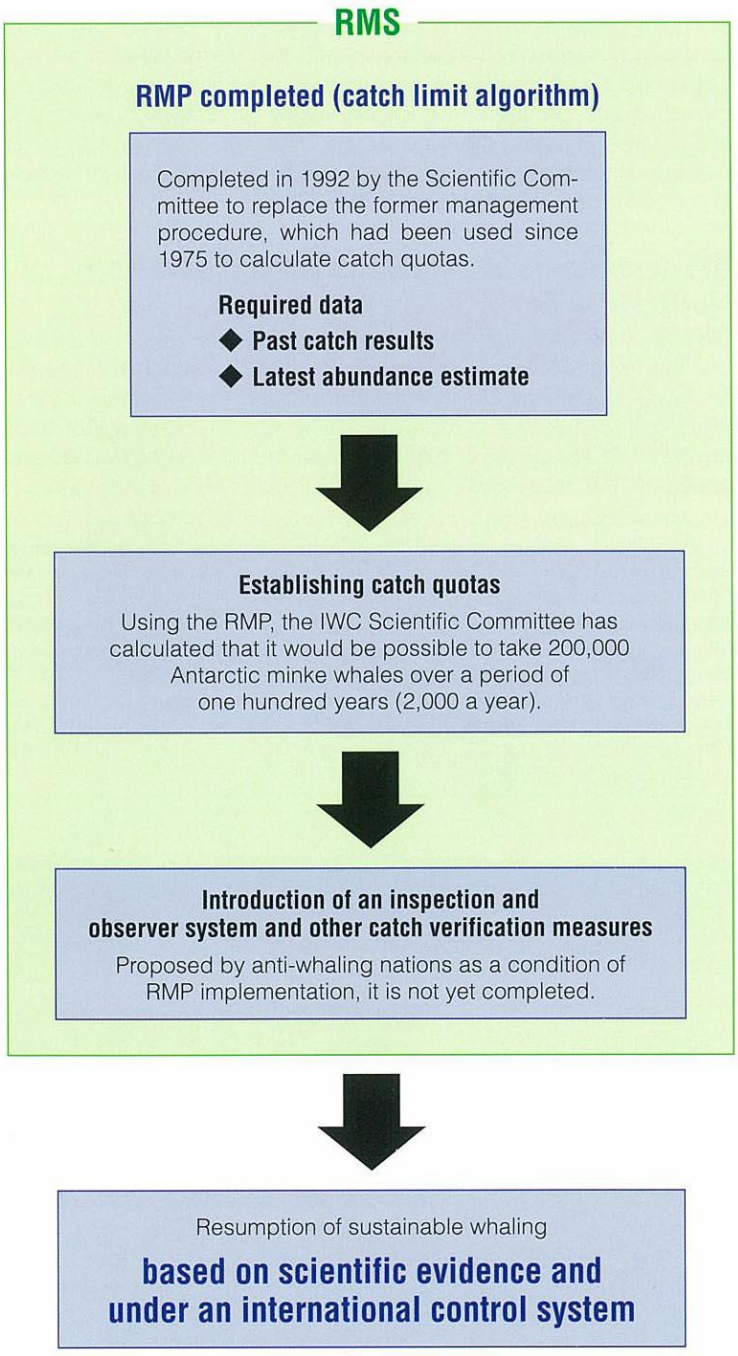
The moratorium on commercial whaling was introduced on the grounds that there were uncertainties in scientific knowledge concerning whale stocks and their management. In an effort to solve the problem, the IWC Scientific Committee completed the Revised Management Procedure (RMP) in 1992 after long and arduous discussions. The RMP is designed to calculate safe catch quotas taking uncertainty related to various factors into account and preventing any risk of depleting whale stocks. When the RMP was applied to Antarctic minke whales with an estimated population of 760,000, the result was that the capture of at least 2,000 Antarctic minke whales per year for the next hundred years would not have an adverse effect on the stock.

However, the anti-whaling countries proposed the introduction of an inspection and observer system and other catch verification measures as an additional condition for RMP implementation so that the RMS has not been completed yet.

After that, IWC discussions on the RMS continued for some time, but with the anti-whaling countries holding the majority and their refusal to review the moratorium on commercial whaling, the ongoing work for RMS completion was suspended as a matter of fact.
RMP: Revised Management Procedure
RMS: Revised Management Scheme



Completion of the RMS for the resumption of whaling



# The ‘Future of IWC’ process

Antagonism between pro-sustainable use and anti-whaling countries at the IWC arising from disparities on their basic position about the utilization of whale stocks has led to the current situation where the IWC has become dysfunctional and unable to make any substantial decision on the management and conservation of whale resources. To resolve the situation, in 2008, the "Future of the IWC" process was initiated aiming to achieve a comprehensive agreement on the main issues faced by the Commission.

However, as no agreement was reached both at the 61st Annual Meeting held in Portugal in June 2009 and the 62nd Annual Meeting held in Morocco in June 2010, a one-year "consideration period" was established to last until the 63th Annual Meeting which was held in Jersey (Channel Islands) in July 2011. Despite these initiatives, as there was no progress made after the consideration period at the Jersey Annual Meeting, it was decided to continue encouraging dialogue amongst IWC member countries.

Under this no agreement situation, at the 64th Annual Meeting held in July 2012 in Panama, a decision was adopted that from now on, the IWC plenary would meet biennially (Commission Meeting in alternate years and Scientific Committee meeting annually). As for the "Future of IWC“, no progress has been made on specific tasks for the process, but the Commission stated its desire to encourage continuing dialogue and cooperation.

Japan will continue making efforts for the resumption of commercial whaling which was temporarily suspended by the 1982 IWC moratorium.



Commercial whaling today

Although the IWC objectives provide "to ensure proper and effective conservation and development of whale stocks" and "thus make possible the orderly development of the whaling industry", since the 1980s, many non-whaling countries suddenly joined the IWC while advocating the anti-whaling position under the leadership of anti-whaling groups, so that by 1982, the IWC moratorium (temporary suspension) on commercial whaling was adopted.

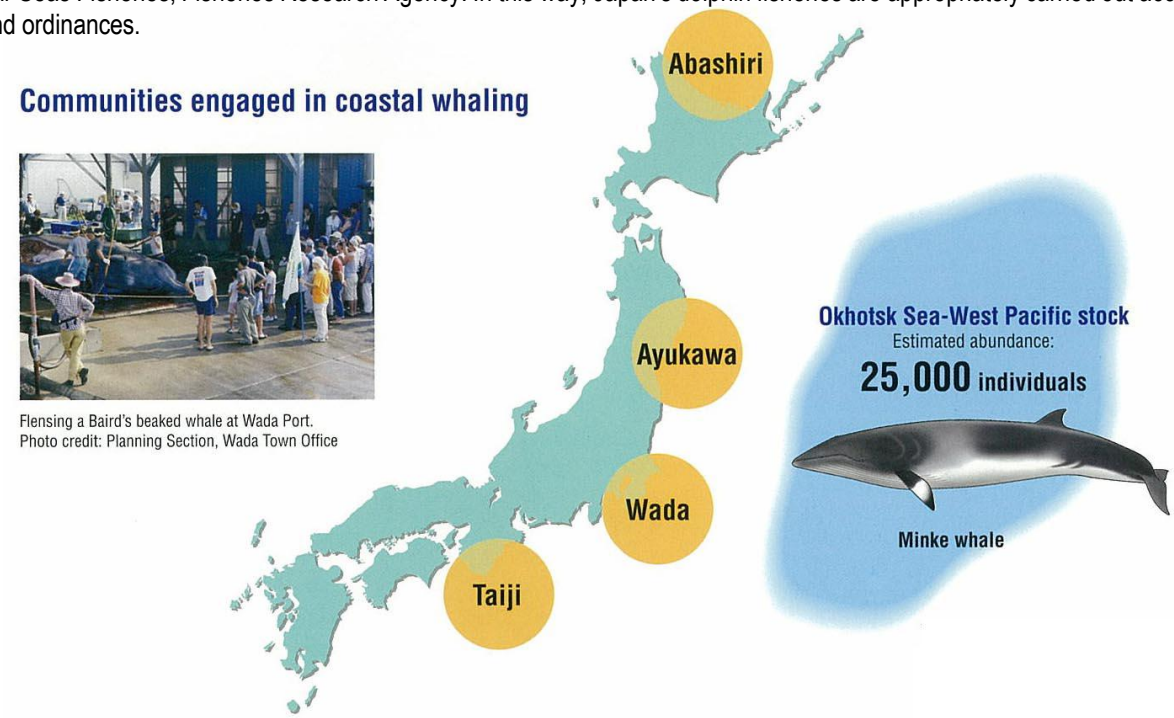
Facing this situation, Norway lodged an objection against the moratorium, and seeing the sub-paragraph provision requiring the revision of the moratorium ten years after its initial adoption not being observed, from 1993 formally restarted commercial whaling. In 1992, together with Iceland, Greenland and the Faeroe Islands, Norway signed the agreement establishing the North Atlantic Marine Mammal Commission (NAMMCO), an international body independent from the IWC for the conservation and management of resources.

Iceland withdrew from the Convention after the adoption of the Revised Management Procedure (RMP) was blocked by the anti-whaling forces in 1992 but rejoined in 2003 with reservations on the moratorium. From 2006, Iceland restarted its commercial whaling.

# Whaling in Japan

Historical and archeological evidence show that the people along the coasts of Japan have been utilizing whales for more than nine thousand years. In the beginning, only stranded dolphins and whales may have been utilized. Afterward, around five thousand years ago, organized dolphin hunts were conducted near the Mawaki site in Ishikawa Prefecture on the Sea of Japan. Then, two thousand years ago, organized hunts of large whales were being conducted sporadically in western Japan. Today, whaling in Japan is present throughout the country in the various forms of many historical and cultural aspects inherited through generations. Whaling in Japan still has significant socio-economical and cultural importance in communities today and has a character similar in many ways to the aboriginal whaling carried out by the United States, Russia, Greenland and Caribbean peoples.
Present day whaling in Japan is classified as small-type coastal whaling and dolphin fisheries. Traditionally, the small-type coastal whaling mainly targeted the plentiful minke whale. However, the IWC implemented a temporary suspension of whaling even for abundant species since 1988. For that reason, the small-type coastal whaling communities cannot commercially utilize this abundant resource. They now engage, under the management of the Japanese government in the capture of Braid's beaked whales, short-finned pilot whales and false killer whales, which do not fall under the jurisdiction of the IWC. It is the long-cherished wish of these small-type whaling communities to resume commercial minke whaling.

Dolphin fisheries include spear fishing and drive fishing. There are dolphin fisheries in Hokkaido and in Iwate, Wakayama and Okinawa prefectures. The small cetaceans do not fall under the jurisdiction of the IWC and are managed under the responsibility of the coastal country government. In Japan, dolphin resources are managed similarly to other fisheries resources, and the Government of Japan sets catch quotas from the standpoint of sustainable utilization implemented through a permit system by the pertinent regional governments.
The dolphin fisheries catch quotas are set based on individual species' abundance estimations by the National Research Institute of Far Seas Fisheries, Fisheries Research Agency. In this way, Japan's dolphin fisheries are appropriately carried out according to law and ordinances.




Flensing a Baird's beaked whale at Wada Port.
Photo credit: Planning Section, Wada Town Office

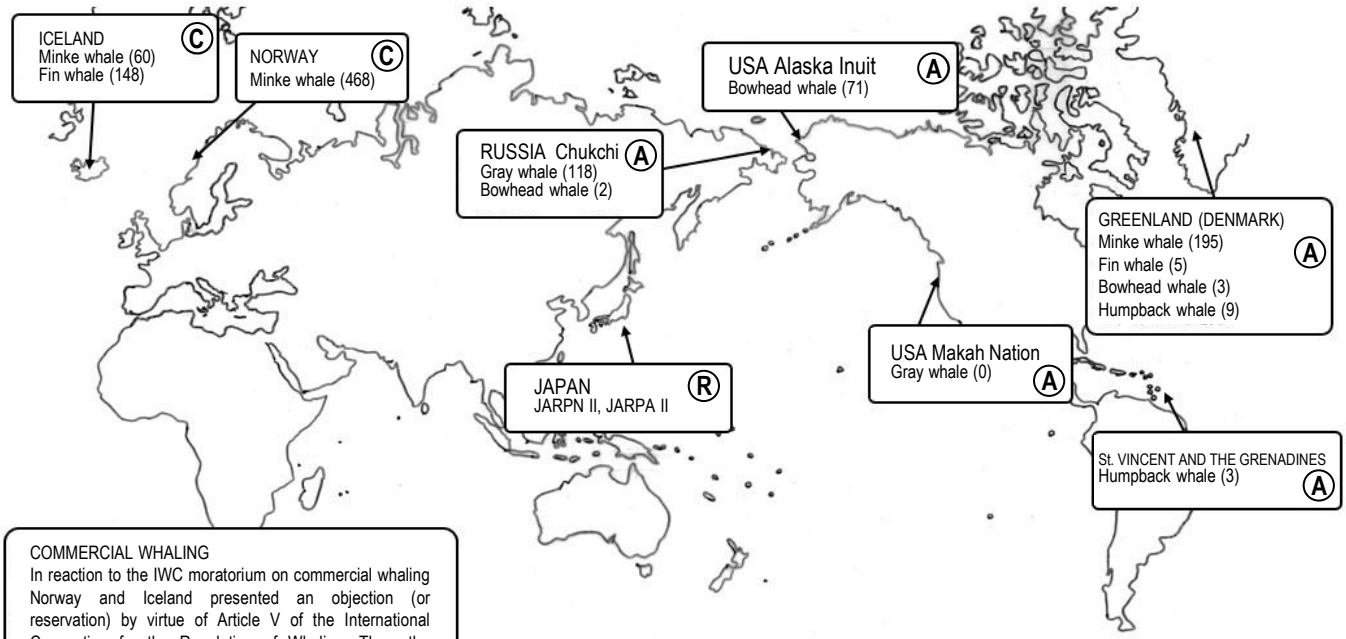
Government of Japan's position on the dolphin fisheries

Whales and dolphins are important fisheries resources ,and they should be utilized sustainably based on scientific evidence. Dolphin fisheries are one of Japan's traditional fishing activities, and they are conducted appropriately in accordance with the law.

Japan Small-Type Whaling Association website: http://homepage2.nifty.com/jstwa/

# Whaling in the world

## Whaling of IWC-managed species in the world
(A: Aboriginal subsistence whaling, C: Commercial whaling and R: Research whaling)




COMMERCIAL WHALING
In reaction to the IWC moratorium on commercial whaling Norway and Iceland presented an objection (or reservation) by virtue of Article V of the International Convention for the Regulation of Whaling. Thus, the moratorium decision does not apply to these countries and they are able to conduct commercial whaling.

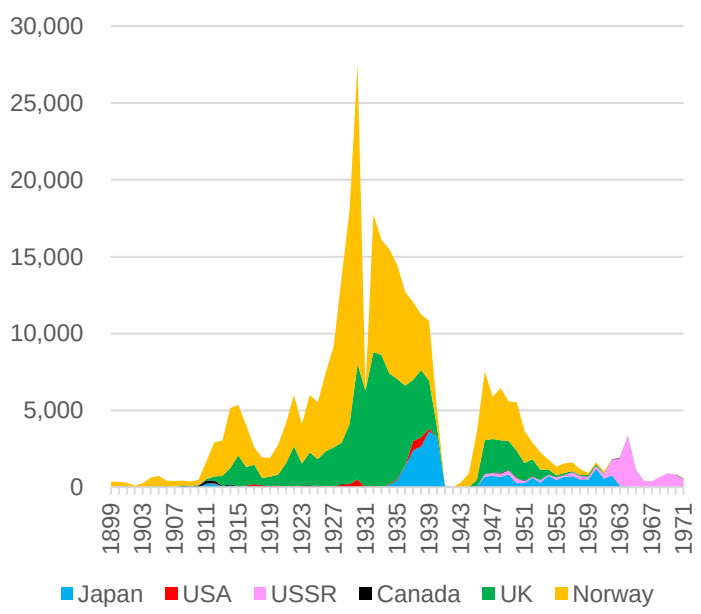
ABORIGINAL SUBSISTENCE WHALING
The IWC recognizes whale quotas set as necessary for the survival of indigenous peoples.

JAPAN'S SMALL-TYPE COASTAL WHALING
Community-rooted coastal whaling has characteristics similar to the aboriginal subsistence whaling. Japan has repeatedly asked the IWC to establish a catch quota for its small-type coastal whaling, but up to now, this request has been consistantly denied.

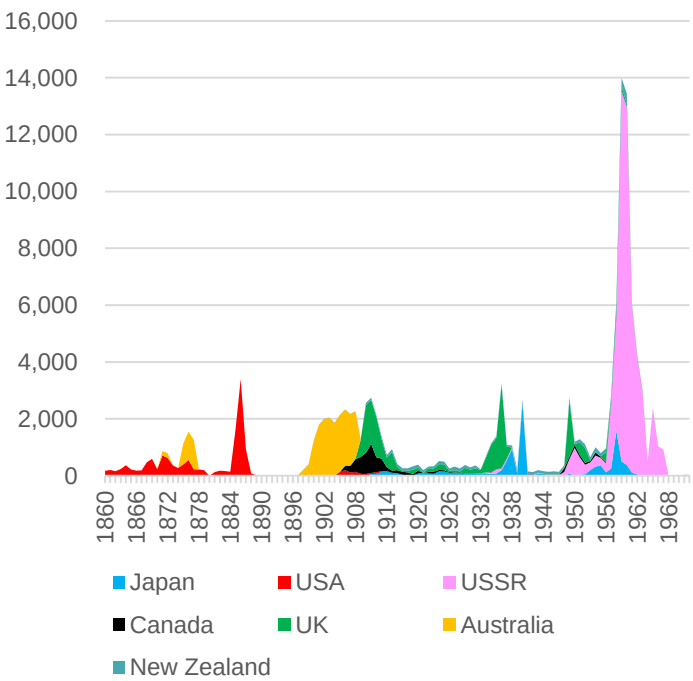
WHALING BY IWC NON-MEMBER COUNTRIES
CANADA (bowhead whale) and
INDONESIA (sperm whale)

* Figures in parentheses indicate number of whales captured in 2010 (Source: IWC)

## Blue whale captures per country




## Humpback whale captures per country

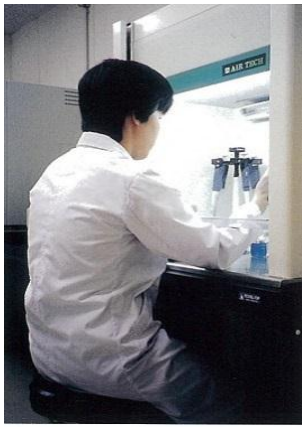


# Whale meat distribution and domestic management

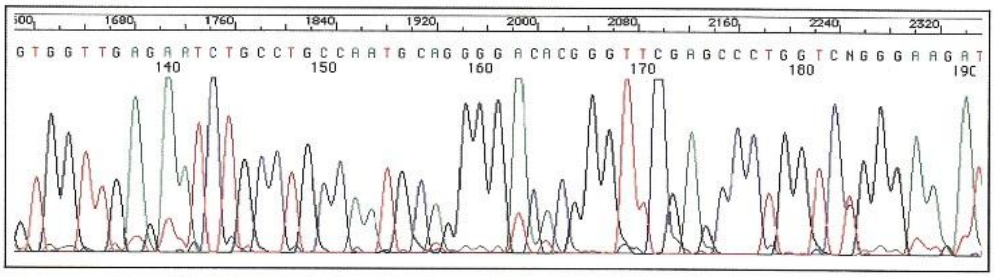
After biological, ecological and genetic measurements, a sampling of whales taken by Japan's whale research programs (minke, Antarctic minke, sei, Bryde's, fin and sperm whale) enter the domestic distribution market as research by-products. Individual genetic information from all whales captured by Japan's whale research programs is collected and stored in a database (DNA registry).

Further, the genetic information of individual whales whose meat may enter the domestic market either from domestic by-catch or imports from commercial whaling countries is similarly collected and stored in the DNA registry database.

By analyzing and registering the DNA of whale meat in the domestic market and cross-checking with the DNA registry database, we are able to prevent illegal whale meat from entering Japan's domestic market.



DNA sample analysis




Base sequence of whale mitochondria DNA (mtDNA). Whales from the same stock show similar mtDNA base sequences.

# Stranding Record

The phenomenon when live cetaceans run aground or their carcasses wash up, or when they stray into rivers away from their natural habitat is collectively known as "stranding". Collection and analysis of data on stranded individuals not only greatly contributes to Cetacean Ecology and Biology advancement but is helpful to better understand ongoing changes in the marine environment as cetaceans are at the top of the food chain. The phenomenon where cetaceans strand in mass (mass stranding) has been explained by various theories, such as terrestrial magnetism, topography, parasite infestation, etc. as possible causes, and as it is not yet fully understood, data collection is indispensable.

Since 1986, the Institute of Cetacean Research has been collecting data on stranding events occurring along the coast of Japan. This database called the ICR Stranding Record includes events involving fishing gear. The Stranding Record data is reported annually to the IWC Scientific Committee. In recent years, in cooperation with the National Museum of Nature and Science, more than 300 marine mammal stranding events (including seals and other pinnipeds, dugong and sea otter stranding data) have been collected annually. Collection of this data cannot happen without the participation of persons who happen to be near the sea and find a stranded marine mammal or who pass along information related to any such incident along Japan's coastline. If you have such information, whether the stranded animal is alive or not, please contact the Institute of Cetacean Research.

Stranding reporting form: http://www.icrwhale.org/zasho.html

A fin whale that stranded in the Bay of Tokyo

Scientists conduct biological survey on a gray whale stranded in 2007 in Tomakomai

# Food culture

## The Japanese have lived with whales since ancient times

The long history of whaling in Japan, from prehistoric times to the present, gave rise to the worship of whales and bore fruit in the culture witnessed today in whaling songs, dances and the various traditional handicrafts that have been handed down from generation to generation. They are historical evidence that the Japanese people have lived in close association with whales. Now is the time to acknowledge the importance of our whaling tradition and food culture. Japanese are and should be proud of this

## Primitive and Ancient whale hunts

### Cetacean remains found at archeological sites

Large quantities of dolphin bones from about five thousand years ago (Early to Middle Jomon period) were found at the Mawaki site in Ishikawa prefecture. In Kyushu, many earthenware pieces made by using whale vertebral plates as rotating tables (called "pottery with whale-vertebra-imprinted bottoms" since the bottoms retain the depressions made from the deep dents of the joints between the corpus vertebrae and the vertebral plates) have been excavated from sites dating back about a thousand years (Middle to Late Jomon period). A whale scene was depicted on the surface of a jar used for burials, dating back some two thousand years (Late Middle Yayoi period) and unearthed at the Haranotsuji site on Iki Island (Nagasaki prefecture). Whales are mentioned in "Kojiki", the oldest existing historical record of Japan compiled in 712. As can be seen, Japanese people have had a close association with cetaceans from ancient times.

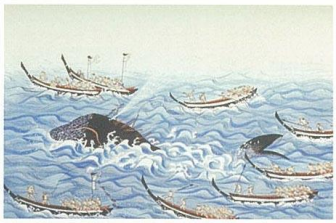
Mawaki site (Ishikawa prefecture). Designated national historical site.
Photo credit (1983): Prof. Tetsuo Hiraguchi, Kanazawa Medical University

Whale-vertebra-imprinted bottom, unearthed at Kurohashi shell mound (Kumamoto prefecture).
Photo credit: Kumamoto Prefecture Board of Education

## Whaling in Medieval and Premodern times

### Progress and spread of whaling techniques

"Hand harpoon whaling" was developed around the twelfth century. Fishermen rowed out to sea and speared whales with harpoons. In 1606 (beginning of Edo Period), Kujira-gumi (a premodern whaling company), the first organization specializing in whaling in Japan was established in Taiji, Wakayama prefecture, marking the beginning of organized whaling. Further, in 1675, "hand harpoon whaling with nets" was developed. This whaling method spread to Tosa (Kochi prefecture), Nagasaki and other areas, and led to a sudden increase in the capture of whales.



From "Ogawajima Hogei Emaki", a collection of paintings of whaling scenes.

## Popularization of whale meat as food

With the introduction of Buddhism into Japan, the eating of animal meat was prohibited, which led to a culture of eating fish. Regarded as a kind of fish, whales had been consumed from old times as a valuable source of protein. It was, however, not until the Edo period that whales became popularized as food, when quantities of whale meat were put on the market and became available to the common people. The book "Geiniku Chomi-gata", a collection of whale recipes for some seventy parts of whales and other special cookbooks were also published. It was also during the Edo period that tombs and monuments for whales were erected in various parts of Japan in gratitude and as memorials for the dead whales' spirits. Performing arts, such as whale songs and dances, also flourished at the time.

"Geiniku Chomi-gata"

## Modern and Present day whaling

### From the beginning of modern whaling to the present

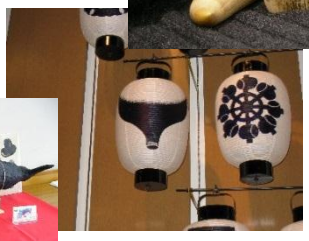
Modern whaling in Japan began with the introduction of the Norwegian whaling method in 1899, which employed harpoon guns (a line was attached to the harpoon, which was shot from the gun) installed on steamships. The Japanese whaling industry had declined for a time, owing to the Western whaling ships that flocked to and overexploited Japanese waters. Coastal whaling, however, recovered with the introduction of the new method, and in 1934 Japanese fleets set sail to the Antarctic Ocean. At that time, American and European countries were engaged in large-scale pelagic operations, which resulted in the severe depletion of Antarctic whale resources. Management controls were introduced that gradually reduced quotas, and the Western nations withdrew from the industry since whaling was no longer profitable. Japan remained to the last, but was forced to cease when the IWC placed a moratorium on commercial whaling. The only remaining whaling today is the research whaling based on the International Convention for the Regulation of Whaling, small-type coastal whaling and the dolphin fisheries which have been conducted in various parts of Japan since old times.

# Whale cultural perception

Whales have been utilized uninterruptedly by the Japanese people since long ago, resulting in the worship of whales and many other cultural expressions such as whaling songs, dances and traditional handicrafts handed down through generations, and it is very much alive today. Whale tombs and memorial monuments for the souls of these animals can be found throughout the land of Japan. From north to south in the country, the meat of whales has been used as food in multifarious ways. In the Hakodate region south of Hokkaido, whale soup (a earthy broth made with salted whale meat, edible wild plants and vegetables) is one of the traditional foods enjoyed during the New Year festivities. In Niigata prefecture, whale soup is consumed typically in full summer to help stand the heat. In the Kansai region centered in Osaka, whale skin or "koro" is an indispensable ingredient for the oden hotch-potch stew and the traditional "hari-hari nabe" whale meat pot is another famous dish from that region. Traditional recipes such as these are still alive while many new forms of original whale cuisine are being created today.














**In Muslim culture whale liver is considered the first food in heaven**

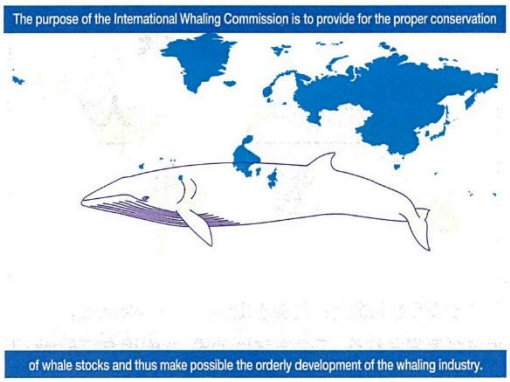
It is proven in the Hadeeth (the saying of the Prophet Mohammad) that the first food offered to welcome the people to Paradise upon entering will be “the caudate lobe of whale liver”.

That is mentioned in the Hadeeth of Thawbaan (one of the Companions of the Prophet Mohammad), the freed slave of the Messenger of Allah (blessings and peace of Allah be upon him), according to which one of the Jewish rabbis came to ask the Prophet Mohammad (blessings and peace of Allah be upon him) about some matters to test him. In the Hadeeth it says:
The Jewish man said: What will be presented to them first when they enter Paradise?
The Prophet Mohammad said: “Caudate lobe of whale liver.

Saheeh Muslim, Page 252, Chapter 3/8, Hadeeth 315.

# Whaling history outline

| | |
|---|---|
| About 7000 B.C. | Jomon (ancient Japanese) people start to utilize whales. |
| About 3000 B.C. | Jomon people start dolphin fishing. |
| About 0 B.C. | Yayoi (ancient Japanese) people start whaling. |
| 9th century | Whaling begins in Norway, France and Spain. |
| 12th century | Hand harpoon whaling using hand thrown spears begins in Japan. |
| 1606 | Sashite-gumi (spearing team) is set up in Taiji (Wakayama prefecture), marking the start of organized hand harpoon whaling. |
| 1612 | Hand harpoon whaling of Baird's beaked whales begins in Wadaura (Chiba prefecture). |
| 1675 | Hand harpoon whaling with nets devised in Taiji. The method spreads to Shikoku and Kyushu regions, inducing dramatic development of coastal whaling. |
| 1712 | Systematic hunting of sperm whales by the colonist settlers starts in Nantucket, Massachusetts (New England). |
| 1838 | Kujira-gumi established in Ayukawahama (Miyagi prefecture), marking the start of organized whaling employing the method of hand harpooning with nets. |
| 1864 | Modern harpoon gun whaling on steamships is developed by Norway. |
| 1879 | Weather conditions deteriorated during the take of a right whale in the seas off Taiji and 111 lives were lost. The tragedy triggers the decline of premodern whaling. |
| 1899 | Japan succeeds in introducing the Norwegian whaling method. |
| 1904 | Norway commences whaling in the Antarctic Ocean. |
| 1924 | Norway commences pelagic operations in the Antarctic Ocean. |
| 1931 | Twenty-six countries sign the first Convention for the Regulation of Whaling (Geneva Convention) within the United Nations Organization. |
| 1934 | Japan commences pelagic operations I the Antarctic Ocean. |
| 1946 | Fifteen nations, mostly major whaling countries, sign the International Convention for the Regulation of Whaling in Washington, U.S.A., which is in effect today. Japan was under U.S. occupation and could not take part, but was permitted by the GHQ to go whaling in the Antarctic. Whale meat thus obtained helped to alleviate the food shortage after the World War II. |
| 1948 | The International Whaling Commission (IWC) is established. |
| 1951 | Japan becomes member of the IWC. |
| 1972 | A ten-year moratorium on commercial whaling was adopted at the United Nations Conference on the Human Environment held in Stockholm. It was also proposed at that year's IWC Annual Meeting, but was rejected as having insufficient grounds. |
| 1982 | The IWC decides to place a moratorium on commercial whaling form 1986. Japan lodges an objection against the decision. |
| 1985 | Following consultations with the U.S., Japan withdraws the objection. |
| 1987 | Japan and the Soviet Union withdraw from commercial whaling in the Antarctic Ocean. Japan launches the minke whale research in the Antarctic. |
| 1988 | Japan suspends the take of minke, Bryde's and sperm whales in her coastal waters. |
| 1990 | The IWC Scientific Committee agrees that there are at least 760,000 minke whales in the Antarctic (1985/86 -1990/91 estimate). |
| 1992 | The IWC Scientific Committee completes the Revised Management Procedure (RMP) and calculates that a take of at least 2,000 Antarctic minke whales per year for the next hundred years would not affect the stock. |
| 1994 | Japan launches the western north Pacific whale research program on minke whales. The IWC accepts the RMP but introduces an inspection and observer system and other catch verification measures (RMS) as a condition of RMP implementation and restarting of commercial whaling. |
| 2000 | Japan launches the Second Phase of the whale research program in the western north Pacific, which includes Bryde's and sperm whales in addition to the minke whale. |
| 2005 | Japan commences the second phase of the whale research program in the Antarctic (JARPA II). |
| 2006 | The anti-whaling countries define their absurd position that the completion of the RMS would not mean the restarting of commercial whaling thus making clear that the RMS completion would be impossible. As a result the RMS completion process comes to deadlock and is postponed indefinitely. |
| 2008 | The "Future of IWC" process is initiated to break the IWC dysfunctional state deadlock. |
| 2010 | The anti-whaling countries reject to base discussions on the IWC President and Vice-president comprehensive proposal on the "Future of IWC" process, so no agreement is reached at the Annual Meeting. |
| 2012 | The IWC Scientific Committee agrees on new two abundance estimations of 720,000 (1985/86 -1990/91 estimate) and 515,000 (1992/93 - 2003/04) for the Antarctic minke whale. |




## Whales & Whaling Weblinks

### Government / International Organizations

| | |
|---|---|
| Whaling Section, Fisheries Agency, Government of Japan | http://www.jfa.maff.go.jp/whale |
| International Whaling Commission (IWC) | http://www.iwcoffice.org |
| North Atlantic Marine Mammal Commission (NAMMCO) | http://www.cites.org |
| Norway | |
| Iceland | |
| Greenland | |
| National Research Institute of Far Seas Fisheries | http://fsf.fra.affrc.go.jp |
| Institute of Cetacean Research | http://www.icrwhale.org |

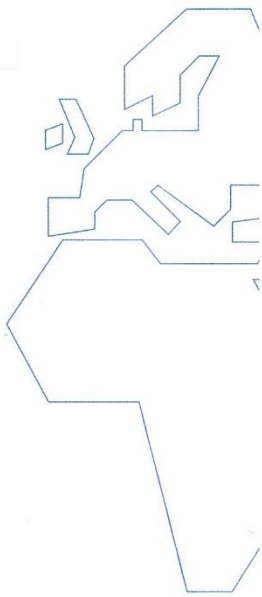
### Related Websites

【Japan】

| | |
|---|---|
| Japan Whaling Association (JWA) | http://www.whaling.jp |
| Japan Small-Type Whaling Association (JSTWA) | http://homepage2.nifty.com/jstwa |
| Whale Portal Site | http://www.e-kujira.or.jp |
| Japan Fisheries Association (JFA) | http://www.suisankai.or.jp |
| Global Guardian Trust (GGT) | http://www006.upp.so-net.ne.jp/GGT/ |

【Outside Japan】

| | |
|---|---|
| High North Alliance | http://www.highnorth.no |
| IWMC-World Conservation Trust | http://www.iwmc.org |
| World Council of Whalers (WCW) | http://www.worldwhalers.com |
| International Network for Whaling Research | http://www.ualberta.ca/~inwr/ |



# Japan Fisheries Agency

**with: The Institute of Cetacean Research**

10.05.18 2,000