Q&A

JARPA II: The Second Phase of Japan's Whale Research Program under Special Permit in the Antarctic – QUESTIONS & ANSWERS

The Government of Japan presented at the 57th Annual Meeting of the International Whaling Commission (IWC) held in Ulsan (Korea) the Second Phase of Japan's Whale Research Program under Special Permit in the Antarctic (JARPA II), and after discussions at the IWC Scientific Committee and the Plenary meetings declared the intention of carrying it out.
The program was launched the season starting from November 2005 to the beginning of 2006. The Institute of Cetacean Research (ICR), which undertakes the program, has brought together this general **Questions and Answers on JARPA II**.

Questions

Answers

Q1: What sort of research whaling does Japan conduct in the Antarctic Ocean?
A1: Japan has been carrying out research whaling since 1987. JARPA (Phase I) took samples of Antarctic minke whales and ended in March 2005. It was conducted with four main objectives in mind: i) the estimation of biological parameters useful for the stock management of Antarctic minke whales; ii) elucidation of the role of whales in the Antarctic marine ecosystem; iii) elucidation of the effect of environmental changes on cetaceans and iv) elucidation of the stock structure of Antarctic minke whales. The first research objective entailed random takes of whales, and individuals were picked out from schools of whales found in sighting surveys conducted along randomly selected courses. This statistical method is called random sampling. <Q17>

Q2: What has JARPA achieved so far?
A2: Results of JARPA are presented every year at the IWC Scientific Committee (IWC/SC) as well as other scientific meetings.
We give a report on the research cruises every year at the IWC/SC, and also submit every time the results of data analyses. In 1997, the IWC/SC held an intersessional review meeting to consider the results of the research program.

The accumulated data were reviewed in detail. In 2005, the final research cruise year for JARPA, the Japanese government hosted a similar review meeting. Japan's research program was highly evaluated at both review meetings. You can look at the outcome of these reviews in the IWC Annual Reports and the website of ICR here. <http://www.icrwhale.org/JARPAReview1.htm> The IWC/SC has decided to have a working group meeting in the fall of 2006 for the final evaluation of JARPA, including the results of the final research cruise.

Here are some examples of JARPA achievements. Previously, it was believed that there existed five or six stocks of Antarctic minke whales in the Antarctic Ocean. We studied the matter comprehensively from genetics, biology, and morphology, and came to the conclusion that there are two large stocks in the research area (eastern portion of Area III to western part of Area VI), which covers nearly half of the Antarctic Ocean, and that they are distributed in their feeding grounds separated by a soft boundary. We also estimated the biological parameters <Q4> of the two stocks. The Antarctic Ocean shows a low level of chemical contamination, including PCBs, and we found that the level of pollutant concentration in Antarctic minke whales is extremely low. We also found that biological parameters, such as age at sexual maturity, age at physical maturity, growth curve, blubber thickness, and stomach content change over the years.
The krill surplus resulting from the past commercial overhunting of large cetaceans was advantageous to Antarctic minke whales, and their speedier growth and precocious sexual maturity had been noted even before Japan's research whaling. The JARPA research found that, around 1970, there was a halt in this decreasing trend in the mean age at sexual maturity after which it remained constant with a slight increase from the early 1970s to the late 1980s. JARPA also found that the abundance of some of the large whale species, including humpback and fin whales, are showing a rapid recovery of late, and that the composition of the Antarctic marine ecosystem continues to change today.

Q3: What is JARPA II about? Why do you need to do the research?
A3: The analysis results of JARPA concerning Antarctic minke whales show that the composition of the Antarctic marine ecosystem is still changing. Striving for the sustainable use of marine living resources, we need to understand where these changes are leading to, and study appropriate management methods and ways of utilization.
However, if we want to learn about these ecosystem changes in shorter time spans it is necessary to expand the scale of research. We have, therefore, designed JARPA II as a comprehensive long-term research program where an interim detailed review will be conducted following completion of the first 6 years of research. JARPA II research will focus on Antarctic minke whale and the larger species humpback and fin whales. The number of Antarctic minke whales to be sampled is 850 (±10%). With the new research design, we will be able to obtain statistical results six years later. If you want to know more details, the plan for JARPA II research program is available for downloading at the ICR website here.

<http://www.icrwhale.org/JARPAIIResearchPlan.htm>

Q4: What are biological parameters?

A4: Biological parameters provide essential information in managing living resources. They include data such as natural mortality rate, age at sexual maturation, pregnancy rate, litter size, recruitment rate, and life span. By comprehensively analyzing the obtained data, we can estimate the yearly number of offsprings born and how many die from natural causes in a given whale stock, and understand the resource trend.

Q5: The age of the onset of sexual maturity of the Antarctic minke whale is said to have decreased; what is the reason and what does it signify?

A5: Past commercial whaling overharvesting of too many blue and other large whales in the Antarctic Ocean led to their numbers being drastically reduced. This generated a surplus in krill that the Antarctic minke whales could feed on. With more food available to them, this probably improved their nutritional condition so that they were able to grow faster and reach sexual maturity at a younger age.

It also means that the number of mature females capable of reproducing increased, and this is also considered to have contributed to the increase in Antarctic minke whale abundance. However, JARPA results revealed that the trend for precocious sexual maturity came to a halt around 1970 and may have actually begun to reverse.

Q6: What exactly is "blubber"? I understand that it has grown thinner, but why is that?

A6: Blubber is characteristic of marine mammals (excluding the polar bear and sea otter) and refers to the skin (epidermis and dermis) and the fat layer beneath. Whales and other marine mammals need to maintain their body temperature in sea water so they store fat beneath the skin as insulation. The layer of fat also serves as a storage place of energy. Antarctic minke whales store a year's worth of energy as blubber during the six months they spend in the feeding grounds of the Antarctic Ocean. JARPA results have shown that the average blubber thickness of Antarctic minke whales taken around December is 2 to 3 cm, which grows to 4 or 5 cm. in March. Besides these seasonal changes, we have also found that blubber thickness changes over the years. Antarctic minke whale blubber began to grow thinner since the 1980s, from which we can estimate that their feeding environment is changing; more specifically, deteriorating.

Q7: What does the monitoring of biological parameters tell you?

A7: Biological parameter monitoring tells us the trend of the whale stocks, whether they will increase, be stable, or decrease. For instance, if their age composition has an inverted pyramid shape (similar to that of the Japanese population), with more old whales than younger ones, it will mean that the reproductive generation will gradually decrease in number and that the stock will be reduced in the future. If, on the contrary, their age composition is pyramidal

and there are more young whales than older ones, the stock is quite robust and either is stable or will increase. In short, biological parameters tell you the present state of the whale resources and provide you with an estimation for the future.

Q8: I've heard that humpback and fin whales have shown a sharp increase in abundance; is it true? What about blue whales?

A8: The JARPA sighting survey results indicate that humpback and fin whales migrating to the research area begun to increase around 1990 (annual rate of increase: 14 to 16%). Australian and other researchers have reported at the IWC/SC an increase of 11% for the West Australian stock of humpback whales and 12% for the East Australian one. Their observations also support the idea that humpback whale stocks are rapidly recovering.

The initial abundance (population before man started whaling) of blue whales has been estimated at about 200,000. The latest abundance estimate by the IWC Scientific Committee members is of only 1,700. Their annual rate of increase is relatively high at 7.3%, but the abundance level itself is still very low (less than 1% of the initial abundance), indicating that the blue whale is recovering but slowly. The reason of this slow recovery is still unclear. Some think that their near depletion led to reduced opportunities for reproduction. Others consider that Antarctic minke whales have increased to the level of being a threat to the blue whale, since they compete over prey and habitat.

Q9: Baleen whales eat krill in the Antarctic Ocean; how much do they consume in one day? Do they have enough to eat?

A9: The estimated amount of krill consumed by Antarctic minke whales is 240-370 kilograms per day and it corresponds to 4 to 5% of body weight. We do not have sufficient data on krill biomass in the Antarctic Ocean, but it should be somewhere between 36 to 38 million tons (in Area IV) which is plentiful enough to feed the baleen whales.

Q10: Hasn't Antarctic krill decreased with global warming?

A10: The November 2004 issue of the British scientific journal NATURE ran an article reporting that Antarctic krill abundance had been reduced by 80% due to global warming. The report, however, applied a decrease of 38% observed in krill abundance in the Scotia Sea near the Antarctic Peninsula to the entire Antarctic Ocean. To use the results (decrease) found in the Scotia Sea to all of the Antarctic Ocean cannot be said to be an appropriate approach, since there are not sufficient data concerning krill abundance in other ocean areas. Therefore, we cannot say that Antarctic krill on which whales prey on is decreasing based on that report alone.

We have not yet detected any effects of global warming in the JARPA research area (35°E to 145°W); however, changes may become apparent in the future, which is why we need to continue monitoring the entire ecosystem, including the oceanic environment.

Q11: What is competition among whale species? What does it mean?

A11: In this context, "competition" refers to rivalry over feed and habitat. In the Antarctic ecosystem, cetaceans, seals and penguins consume mainly Antarctic krill. The ecosystem is considered to be relatively simple with krill as the dominant food source.

For the past few decades Antarctic minke whales have been making use of most of the krill surplus brought about by the depletion of other larger whales. Lately however, humpbacks, fins, and other great whale species have recovered rapidly and the numbers migrating to the research area have increased, causing the Antarctic minke whales, which before had been ranging throughout the research area, to be pushed back to the ice edge near the Continent. This strongly suggests some sort of influence is being exerted among 4 competitor whale species, which include the blue whale. We do not know, however, what and how much the increased number of humpbacks, fins and other great whales feed on, and we expect the planned surveys will reveal this information.

Q12: What is an ecosystem model? And what can you find out when you develop one?

A12: Here, an ecosystem model incorporates the organisms that constitute the same ecosystem in a given area of sea as components. Using information on their abundance, food habits, and other data, an ecosystem model shows not only the direct “prey-predator” relationship but, by elucidating their indirect relationships through other organisms, it also shows how their abundance is changing. It also predicts or estimates how a decrease in one species by capture will affect other species. The model will help us consider measures for the sustainable and effective use of the living resources. The more complex a model is, the more information, both in types and amount, is required, and interpretation of the results becomes also more difficult. We intend, therefore, to start with an ecosystem model using a few species.

Q13: How do you elucidate whale stocks and why do you need to?

A13: In this context, "stock" refers to a breeding group as a unit object of resource management. The status of resources may differ among whale stocks. A particular stock could be depleted if management policies that do not take this fact into account were implemented. In recent years, DNA analysis and other genetic methods have become the mainstream in stock identification, but they are not always sufficient, and a comprehensive approach is necessary that includes morphological comparisons and other biological information such as breeding seasons.

Q14: How do you manage whale resources and what can you do to improve managing methods?

A14: The Scientific Committee of the IWC developed the Revised Management Procedure (RMP) to calculate catch quotas for commercial whaling. The Scientific Committee agreed on the RMP in 1992 (however, the IWC plenary insisted on a comprehensive management system [Revised Management

Scheme - RMS] that includes an observer/regulation scheme, and it is still under discussion). The RMP takes into account every conceivable condition and the catch quota thus calculated has been designed to maintain whale stocks at a high level even one hundred years later. Past number of takes and abundance estimates only are used for the calculation. The limited input data makes RMP almost excessively safe so that frequently it makes impossible to use robust stocks that would not be adversely affected in any way. One of the scientists who developed the RMP says that if it were applied to land animals there would be no catch quota for any animal.
At the interim review meeting held by the IWC Scientific Committee, it was agreed that information from JARPA has the potential to improve the management of the whale stocks and could be used to increase the allowed catch without increasing the depletion risk. JARPA II has been designed to further this objective and provide more data so that efficient resource management will be possible with the RMP.

Q15: Where in the Antarctic Ocean do you conduct the research? Also, why have you chosen the area(s)?

A15: The IWC has divided the Antarctic Ocean into six areas for management, and JARPA II will cover the eastern portion of Area III, Areas IV and V, and the western portion of Area VI. In longitude, the research area is from 35°E to 145°W, which corresponds to about half of the Antarctic Ocean. The area covered is the same with JARPA, and it was chosen since it is the closest from Japan and data from the days of commercial whaling are available; that is to say, a time series of data necessary for monitoring is already accumulated for the area.
To understand resource trends we need to monitor biological parameters and dietary conditions of a whale stock as one unit. The data necessary for this stock identification has been collected in JARPA, including DNA analysis, morphological comparisons and biological information. Monitoring of the stocks will enable us to get a better idea of whale resource trends.

Q16: What is a sighting survey?

A16: As the name indicates, whales are counted with the human eye to find how many there are and how they are distributed. However, it is impossible to count them all since whales are often under water, so we use a research method called the line transect method. With this technique, a randomly selected line of survey (course) is set down beforehand in the research area, and the sighting vessels sail along it looking for whales. The number of whales along the course is estimated from the number sighted; it is then applied to the entire survey area to figure out abundance estimate. The sighting surveys provide abundance estimates essential for whale resource management. Two dedicated sighting vessels will be used in JARPA II to cover a larger area and obtain more precise information.

Q17: What is random sampling? How is it different from ordinary takes of whales?

A17: Random sampling is a random collecting of data using a table of random numbers to avoid any arbitrary bias to the data gathered. For instance, the age composition of a given group is an important clue in estimating future population, whether the group will increase or decrease. However, data will have to be collected in a neutral way to find out the age composition, and that was impossible during the days of commercial whaling, since hunts were planned for profit. They took larger individuals in seas abounding in whales, so the data obtained was of older whales and sex ratio was quite often imbalanced. JARPA II will obtain representative data of the surveyed whale stocks by doing random sampling as was the case with JARPA.

Q18: How long are you going to continue the research program and when will you get results?

A18: The results of JARPA suggested that there has been a major structural change in the Antarctic marine ecosystem of late. Phase II will continue with monitoring activities and aim for the appropriate management and utilization of whale resources in the Antarctic. With JARPA, it took more than ten years to find past changes. In JARPA II, we intend to detect these changes in a shorter time span by increasing the number of samples and shortening the research period.
At least three research cruises (three years) will be required for any statistical discussions. Two research areas will be covered in alternate years in JARPA II, which means at least six years will be necessary to obtain three years' worth of data for each research area. The research plan will be changed and improved as necessary after a review of JARPA II results six years from commencement.

Q19: How did you decide on the number of Antarctic minke whales to take?

A19: The results of JARPA show that there has been a structural change in the Antarctic marine ecosystem. These changes must have started more than ten years ago, but it was only recently that we were able to discern them. For the appropriate management of whale stocks, prompt detection of changes in the ecosystem is necessary in order to develop appropriate measures. JARPA II will obtain three years' worth of data from two research areas, the minimum required for statistical analysis and detect changes including sexual maturity age, pregnancy rate and blubber thickness. The number of whales has been decided by calculating the minimal samples required for the foregoing. Research methods and number of samples will be reconsidered six years later, according to need, when the results will be reviewed.

Q20: Why have you added the take of humpback and fin whales in JARPA II?

A20: The two species had been commercially overhunted and nearly depleted in the 1960s, but there have been reports of their rapid recovery in some areas of the Antarctic Ocean. Sightings of humpback and fin whales in the research area notably increased around 1990, and the number migrating to the Antarctic, which is their feeding ground, has been increasing. The recovery of humpback whales is especially notable and researchers in Australia and others have reported an increase of more than 10% in the eastern and western coasts of Australia, their

breeding grounds.
The increase in the larger whales has affected Antarctic minke whales, which up till now had been the dominant species. Recent research results indicate that humpback whales may have forced back the minke whales near the ice edge along the Antarctic Continent. We need to learn about the relation (competition) among whale species ranging in the same area, since they affect one another. It has been pointed out that data on Antarctic minke whales alone is insufficient for the appropriate management of whale resources, which is why humpback and fin whales have been included in JARPA II.

Q21: I understand that all whales are endangered; is it all right to take them?
A21: First of all, it is a misunderstanding that all whales are endangered. For instance, the initial abundance (population before man started hunting) of Antarctic minke whales is estimated at 80,000; yet in 1991, the IWC agreed that there are 760,000 (however, this estimate is at present under revision at the IWC). The decrease of larger species, such as the blue whale, that were the rival of the Antarctic minke whales in their feeding grounds probably contributed to the latter's increase. In the western North Pacific off the coasts of Japan, it has been estimated from the sighting surveys that there are 25,000 minke, 25,000 Bryde's, and 28,000 sei whales. The gray whale stock in the eastern North Pacific is regarded as nearly having recovered to their initial abundance and is estimated to number 26,000. The JARPA results have confirmed the rapid recovery of the humpback and fin whales in the southern hemisphere.
On the other hand, blue whales in the southern hemisphere are still floundering at a low level (there are probably only 1,700), although more than forty years have passed since their take was banned after being commercially overhunted. Plans for their recovery are now under consideration. The whale species to be sampled in JARPA II (Antarctic minke, fin, and humpback whales) have recovered to a robust or nearly robust stock level and the research poses no risk to them.

Q22: Won't whale stocks become extinct if you take so many whales?
A22: The stocks of whale species to be sampled in JARPA II (Antarctic minke, fin, and humpback whales) are robust or nearly robust. About 320,000 Antarctic minke whales (Indian Ocean stock: 228,000; Western South Pacific stock: 95,000), 50,000 fin whales (Indian Ocean stock: 31,000; Pacific stock: 16,000) and 40,000 humpback whales (D-stock: 32,000; E-stock: 4,000) migrate to the research area. The number of samples (whales taken) will be 850 ±10%, 50, and 50 respectively, and quite small enough for their abundance level. Also, in designing the program, we have confirmed, using the standard methods accepted in the IWC (Hitter/Fitter Approach, etc.), that there will be very little effect on the stocks. For details please refer to the appendix of the plan here. <http://www.icrwhale.org/JARPAIIResearchPlan.htm>

Q23: Can't you do research without killing any whales?
A23: There are two types of survey methods: research that is impossible without

killing whales (lethal methods) and the kind that can be done without killing any (non-lethal methods). For instance, non-lethal sighting surveys using the line transect method are carried out to find out abundance estimates of whale stocks. However, data for the estimation of age at sexual maturity and pregnancy rate, the measuring of blubber thickness, and weight and prey species of stomach content are not possible without killing the whales. As with the previous program, JARPA II combines both lethal and non-lethal methods according to research purposes.

Q24: What is the difference between commercial and research whaling (whale research program)?

A24: In general, commercial whaling is done for profit, while the purpose of research whaling (our research program) is to obtain scientific data. The International Convention for the Regulation of Whaling stipulates that whale resource management should be based on scientific findings. It also states that any contracting government may grant to any of its nationals a special permit to kill, take, and treat whales (Article VIII), notwithstanding the Moratorium on commercial whaling. Therefore, Japan's research program is not restricted by any regulations on commercial whaling, such as the Moratorium and the Southern Ocean Sanctuary.

Q25: Perhaps Japan is carrying out commercial whaling under the guise of a research program to make money?

A25: Japan's research program is carried out to obtain scientific data for the sustainable use of whale resources and not for the pursuit of profit by marketing whale meat. On the other hand, it is stipulated in Paragraph 2, Article VIII of the International Convention for the Regulation of Whaling that "any whales taken under these special permits shall so far as practicable be processed and the proceeds shall be dealt with in accordance with directions issued by the Government by which the permit was granted." The ICR, therefore, markets whale meat from the research takes in accordance with directions issued by the Japanese government and allots the proceeds to fund research for the next year and onwards.

Q26: What exactly is the IWC Moratorium on commercial whaling?

A26: The IWC moratorium means that the member countries of the IWC will suspend temporarily all commercial whaling. A resolution for a ten-year moratorium on commercial whaling was adopted at the 1972 United Nations Conference on the Human Environment. It was claimed that all whales were endangered, but the resolution had no scientific basis, and at the annual meeting of IWC held in the same year the adoption of the Moratorium was voted down. However, partly due to hard-line anti-whaling nations maneuvering to gain a majority, it was adopted in 1982 at the IWC, still without any scientific grounds. There was a collateral condition to the adoption of the Moratorium, specifying that “a comprehensive evaluation of whale stocks shall be implemented by 1990 at the latest and a catch quota other than zero set down” (in other words,

commercial whaling would be resumed). It is now apparent that the Antarctic minke whale stocks and western North Pacific minke whale stocks are quite robust; yet the collateral condition has not been fulfilled to this day owing to the unreasonable opposition of anti-whaling nations that has no scientific grounds.
The IWC Scientific Committee, by the way, has never once recommended that a moratorium be placed on commercial whaling.

Q27: What is the connection of Japan's research whaling with the IWC?
A27: Japan is a signatory to the International Convention for the Regulation of Whaling, and a member of the IWC which was established based on the Convention. The Convention recognizes the right of contracting governments to give permission to take whales for scientific purposes (Article VIII), and the ICR, with authorization from the Japanese government, carries out the research programs. Member countries planning any research whaling are required to submit in advance their program plans to the IWC Scientific Committee for reviews to judge whether the research plans are justifiable and appropriate.
Japan's research programs have all been submitted to the IWC Scientific Committee and reviewed. Scientific data from the research programs have also been reported every year at the IWC Scientific Committee and highly evaluated by many scientists, including those of anti-whaling nations.

Q28: Isn't it against the law to take whales in the sanctuary designated by the IWC, even if it is for scientific purposes?
A28: Not at all. The Southern Ocean Sanctuary was established in 1994 in the Antarctic Ocean as a management measure for commercial whaling (Paragraph 1, Article V of the Convention). Research whaling, on the other hand, is stipulated as a right of contracting governments (Paragraph 1, Article VIII), and measures for commercial whaling do not apply to the take of whales for scientific purposes. Paragraph 1, Article VIII clearly states "Notwithstanding anything contained in this Convention..." and research whaling is exempt from Paragraph 1, Article V.
The IWC Scientific Committee has not recommended any necessity for the Southern Ocean Sanctuary and there are no scientific grounds for its establishment. In 1992, the IWC completed a new way to calculate safe catch quotas (Revised Management Procedure), so that it became theoretically possible to resume commercial whaling. The fact of the matter is that the Sanctuary was set up as the result of the anti-whaling nations' (they consisted a majority in the IWC) determination to oppose commercial whaling come what may. The Convention clearly stipulates that whale management measures must be based on scientific findings, which in fact makes the Sanctuary against the law.

Q29: Some people say that whale meat contains a lot of PCBs and mercury; how is the contamination in the Antarctic Ocean?
A29: PCBs, mercury, and other chemical pollutants produced by human activities are released into the atmosphere, and then washed from the land into

the ocean. They are known to become biologically concentrated through the food web, the plankton taking them in from sea water, which are in turn eaten by fish and then marine mammals.
Cetaceans are distributed over a wide range, from coastal seas to the Antarctic Ocean. They mainly feed on zooplankton, fish, and squid, and lead a varied existence, depending on species and habitat. Consequently, the degree of contamination varies among species and area.
The Antarctic Ocean, the feeding ground of Antarctic minke whales, is a great distance away from contamination sources and is known for its low level of pollutants in the environment. Further, the Antarctic minke whales feed on Antarctic krill and other lower trophic level zooplankton, and the JARPA research program has shown that their level of contamination is extremely low.
JARPA II will make most of this aspect of the Antarctic Ocean and Antarctic minke whales, and provide the data for control groups (whales in non-contaminated seas) necessary for the evaluation of the effects of pollutants on cetaceans in the northern hemisphere. The Antarctic Ocean is the terminal of contaminants and the monitoring of its marine biological environment should at the same time serve as a monitoring of the global spread of pollutants.

Q30: I think you should publish the data you have collected; can you tell me how they are treated?

A30: The results of the research program are submitted to the IWC Scientific Committee every year, and have been appreciated and highly evaluated by scientists of various countries, including anti-whaling nations. The data obtained from the surveys are compiled as a data list when the surveys are midway or have been completed, and presented to the IWC Scientific Committee. They are supplied to scientists who wish to use them, according to the regulations of the IWC Scientific Committee. However, the original data before any analysis are internationally regarded as primarily belonging to the research body or the researcher(s) since they have spent much resources, time and effort to obtain them. The ICR is no exception and as a general rule does not grant third parties access to the data. However, if the IWC Scientific Committee requests the use of the data for stock evaluation or if there is any application for collaboration, the ICR may accept them, according to our regulations and after considering the requests. Data collected by the research programs have been actually provided to some of the scientists in the IWC.

Q31: I understand that most countries are against Japan's research whaling; why do you go ahead when there's so much opposition?

A31: First of all, it is not true that most countries are against our research whaling. At present, there are about as many pro-whaling nations as anti-whaling ones in the IWC. The latter insist that we stop research that involves the take of whales and use only non-lethal methods. The pro-whaling nations which take up nearly half of the IWC membership consider Japan's research whaling essential for the collection of scientific data necessary for the management of whale resources, and support our programs. Scientific

information such as the dynamics of each stock (breeding rate, abundance, increase/decrease trends, etc.) and the ecosystem composition (prey-predator relations, etc.) is necessary for the sustainable use of marine living resources, including whales. The fact is widely recognized in various international organizations other than the IWC, as was unanimously agreed at the FAO (Food and Agriculture Organization of the United Nations) Committee on Fisheries (COFI) (paragraph 39, FAO/COFI 24 Report). Japan's research whaling is carried out for the purpose of collecting these scientific data. The sustainable use of marine living resources is accepted as a matter of course in international organizations other than the all too politically inclined IWC. Many countries support Japan's research whaling because it provides valuable scientific information.
Japan conducts research using both lethal and non-lethal methods, and it should be noted that not one of the countries that are against Japan's research whaling supply the IWC with scientific data of our quality standard. Many of them do not even do any cetacean research.

Q32: I've heard that JARPA II was criticized in the scientific journal NATURE.
A32: The June 16, 2005 issue of NATURE ran an article by four scientists that criticized JARPA II. Regrettably, the article contains misconceptions and false representations of facts that put in question their credibility.
For instance, it says that JARPA II was criticized at the IWC Scientific Committee, but does not mention that there was quite a lot of support and favorable reception as well. The tone tends to be emotional claiming that research whaling is a front to kill whales, and totally disregards the high estimation the program has received from the IWC Scientific Committee for the scientific data provided. The article also claims that the increase in the samples taken will have an adverse effect on the stocks, without presenting any scientific grounds for such argument (Japan has shown, in the program plan, the analysis result that the number of samples will not have any adverse effect). In fact, the four scientists contributed the article to NATURE by violating the rule that, to maintain neutrality, the outcomes of the discussions in the IWC Scientific Committee are not to be made public before the IWC Plenary. The ICR requested NATURE to run a refutative article <www.nature.com/nature/journal/v436/n7053/full/436912c.html> and the IWC Secretariat has circulated a warning to contracting governments never to repeat any violation of its rules.

Q33: Is it true that hardly any of the research whaling results have been published as scientific papers?
A33: It is merely a one-sided claim of scientists who are against research whaling that there are few papers published. We have contributed as many as eighty-four papers about our research whaling to peer-reviewed scientific journals (both English and Japanese). We have also submitted more than 150 papers to the IWC Scientific Committee (either as of June 2005). Needless to say, the IWC Scientific Committee is regarded as the world authority on cetaceans among international organizations that hold scientific discussions on

whales. It is only to be expected that the number of papers on research whaling submitted to the Scientific Committee exceeds those contributed to other scientific journals.
Incidentally, it is to be regretted that some of the American, British, and German scientific journals have refused to publish our papers in a most unscientific attitude, claiming that they are the analysis results of data obtained by lethal methods.

Q34: Where can I go if I want to read up the results (papers, reports, etc.) of the research programs?

A34: The results of the research programs can be found in academic journals, documents submitted to the IWC, periodicals (Geiken Tsushin) and pamphlets issued by the ICR, and popular scientific magazines as well as books. You can also read them at the ICR. In January 2005, a review meeting was held to discuss the results of JARPA. Documents submitted to the meeting as well as the report on the review can be downloaded from the ICR website here. <www.icrwhale.org/JARPAReview1.htm>
The list of these scientific papers is in the Annual Report of the IWC (*Rep. Int. Whal. Commn* 40:377-408, 1998). The latest version was distributed at the review meeting and is available for downloading at the ICR website here. <www.icrwhale.org/JARPAlist200506.htm>

Q35: Is true the claim by NGOs promoting animal welfare claim that the killing methods of Japanese research whaling are cruel?

A35: Harpoons are shot from cannons to take the high-speed swimming whales. The hunting method is the same for commercial and research whaling, but special harpoons with an explosive charge at the tips are now used to shorten the time until death as much as possible, in which whales may suffer. This type of harpoon called “grenade harpoon” was adopted as the most humane killing method at the IWC after long years of research. Japan uses an efficient grenade harpoon of our own development. We have done various studies on the subject, including autopsies on the whales taken in the research program, and have succeeded in improving the instantaneous death ratio and shortening time to death (TTD). The ratio and TTD are comparative to those for land animals like deer and kangaroos. Also, Japan voluntarily submits data on the killings to the IWC every year in an effort to further improve the instantaneous death ratio.

Q36: Japan markets whale meat obtained from research whaling; how is the income from the sales used?

A36: It is stipulated in Paragraph 2, Article VIII of the International Convention for the Regulation of Whaling that "any whales taken under these special permits shall so far as practicable be processed and the proceeds shall be dealt with in accordance with directions issued by the Government by which the permit was granted." The ICR, therefore, markets whale meat from the research takes in accordance with directions issued by the Japanese government and allots the proceeds to fund research for the next year and onwards.