



# The Antarctic and Southern Ocean Coalition

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**Protecting the Southern Ocean Sanctuary  
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## **Annex<sup>1</sup>**

### **1. Background**

More than a quarter of a century ago the International Whaling Commission (IWC) decided, by due process, to set all catch limits for commercial whaling to zero, indefinitely, for those species of whales for which it accepts conservation responsibility. That decision came into effect in 1986. In 1994 the IWC declared, again by due and proper process, the entire Southern Ocean as a sanctuary for whales. It is less well-known that before the 1982 decision, and in some cases long before, the IWC had set zero catch limits for all of the large baleen whales in the Southern Hemisphere, had declared a moratorium of indefinite duration on the catching of sperm whales, and had prohibited pelagic whaling (i.e., whaling using factory ships accompanied by catcher boats) for all species and stocks except the minke whale. Thus the direct effect of the 1982 decision, as far as the Southern Ocean was concerned, was to set zero catch limits for the minke whale throughout the southern hemisphere, and to confirm all the existing zero catch limits.

A general commercial moratorium, to last ten years initially, was called for in 1972 by the United Nations General Assembly, but was rejected at the time, and for a decade thereafter, by the IWC. The reasoning behind the UN call was essentially the same then as that for the 1982 decision: first, it was considered that time should be allowed for the whale stocks – especially those that feed in the Southern Ocean – and the ecosystems fractured by decades of intensive whaling to begin to recover, during which period a more effective, science-based procedure for managing any eventual resumed whaling would be devised and put in place; and secondly, that whaling should pause or not be permitted to start on stocks for which there was no evidence regarding their sizes and potential.

By the 1980s a third consideration had arisen: several governments had come to the conclusion that commercial whaling should be brought to a permanent end. Among these, the Government of Australia, responding to public opinion and legal advice, was the first to declare an unambiguous policy. This evolution of attitudes to whales and whaling was in part effected by discoveries about

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<sup>1</sup> This is the Annex to the ASOC Opening Statement, which is published separately. ASOC is an IRS Section 501(c)(3) environmental organization incorporated in Washington, DC, which has had expert-observer status to the Antarctic Treaty Consultative Meeting and the Convention on the Conservation of Antarctic Marine Living Resources for many years. ASOC also has observer status to the Agreement on Conservation of Albatross and Petrels. Thirty-one environmental organizations around the world are dues-paying members of ASOC. ASOC's governance documents and information papers may be found at [www.asoc.org](http://www.asoc.org). ASOC is grateful to Dr. Sidney Holt for his research and assistance in preparing this paper.

the behaviors and natures of baleen and toothed whales and the invention of many effective ways of studying them in life; hitherto most biological research had been on dead animals, either on whaling vessels and at land stations or on those naturally stranded on beaches.

Although the IWC rejected the UNGA's call, it did, in 1974, adopt what was then labeled an "amended moratorium", more formally the New Management Procedure (NMP), thought at the time to be a viable management procedure. The NMP was intended to allow whaling only on stocks that had not yet been excessively impacted by catching, and to protect all others that were assessed to have been reduced to below about half of their original, pre-whaling numbers. This procedure did in fact lead quickly to many zero catch limits, hence closures, but it turned out that in other cases available data were entirely inadequate for this purpose. This was particularly so for the minke whales of the Southern Hemisphere. It was that failure that was primarily responsible for the conclusion reached by many governments by about 1980 to cease trying to apply the NMP to the minke and also to the Bryde's whales, and to again consider declaring a moratorium.

The 1973-75 response to the UNGA's call also included the conduct of an International Decade of Cetacean research (IDCR). Scientists drew up a programme of studies for this, but year after year the UN-system (primarily FAO and UNEP), the IWC itself, and governments failed to allocate adequate financial resources to this enterprise, with one major exception – the Government of Japan, and a short-term one – the USSR. Both countries provided vessels for a number of years for the conduct of whale sightings surveys in the Antarctic. These activities were planned and supervised, and their results analyzed, by groups of scientists from several other IWC Member states, with funds from their own governments and some from a fund established by the IWC. Other scientists, supported by NGOs, also contributed to this effort.

Ultimately three six-year sets of circumpolar surveys were completed. They were, however, finely focused on counting minke whales with a view ultimately to stabilizing whaling at a sustainable or "optimal" level. The first circumpolar series provided an estimate of the number of minke whales feeding in each of six sectors, and the observations made were also used to provide rough and partial estimates of the fin, blue and sei whales feeding in the surveyed areas. (These numbers were much lower than had previously been thought, from other – and evidently flawed – assessment methods). The second and third survey series have, however, produced very different estimates of the numbers of minke whales, for unknown reasons, so that the IWC's Scientific Committee (SC) now has no accepted estimate even of the approximate number. No scientifically valid attempt has yet been made to estimate the numbers of the other baleen whale species from the second and third sighting series.

Proposals and plans for enhanced research activities in the Indian Ocean and in the Southern Ocean (for example those emanating from workshops in, respectively, Zeist, Netherlands, and Galway, Ireland organized by NGOs and endorsed by the IWC) when these regions were declared as sanctuaries have also resulted in little additional funding. It is clear that research in the Southern Ocean will continue to be largely directed to studies related to the possible resumption of commercial whaling if the only governments that finance it are those wishing to conduct whaling. A significant policy shift by governments and international organizations is needed to fund the sorts of research called for in this paper. To that end we applaud the Government of Australia's call, first expressed at the March 2008 IWC Intersessional Meeting in London, for the launch of a cooperative, long-term, non-lethal international research effort - the Southern Ocean Whale Research Partnership, "building on the model of the IWC's Southern Ocean Whale and Ecosystem Research (SOWER) programme but expanding its goals and the range of countries involved."

In 1987 the Government of Japan instituted a large, and now rapidly expanding research programme called the Japanese Whale Research Program Under Special Permits in the Antarctic (JARPA), and now JARPA II, in which large numbers of minke whales – and more recently Bryde's, fin, sei and sperm whales – have been killed under a provision in Article VIII of the International Convention for the Regulation of Whaling 1946 (ICRW, under which the IWC is established) that allows governments unilaterally to issue an unlimited number of Special Permits to kill whales, provided they are declared to be for scientific research. The research activities that these Permits facilitate have been criticized continually and strongly by most Member governments of the IWC, and by other scientists, particularly on the grounds that they have not contributed, and will not contribute, to improved methods of managing any future whaling, as claimed.

The so-called "scientific whaling" is, equally, "commercial whaling" since the commodities produced by it are sold on an open market, and the income is used to contribute to the costs of the Permit whaling operations, including staff of the Institute of Cetacean research (ICR) which actually manages the operations. This has facilitated expansions of the programme, by positive feedback that has nothing to do with scientific needs. The expansions have included extension of scientific whaling first to a wider area of the Southern Ocean and then from the Antarctic to the North Pacific, annual increases in the numbers of minke whales caught, and the additional killing of bigger, and rarer species. This last is important because the larger species, especially fin whales, each yield very much more meat, and hence provide higher income than a minke whale. A single southern hemisphere fin whale, for instance, yields seven to eight times as much meat as a single minke whale.

"Commercial whaling" is not defined in the ICRW or in any of the decisions made to date by the IWC; formally it would therefore take the meaning of the word "commercial" in common language, and so would, in practice, include all whaling except that called "aboriginal subsistence whaling" for which the IWC has developed clear criteria. Article VIII of the ICRW requires that the carcasses of whales killed under Special Permits be processed and the products from them not wasted, though there is no requirement that they be offered for sale on the open market. In theory those products could be distributed free, for instance to public institutions such as hospitals, schools and prisons. But, in practice, they are always marketed and hence whaling under Permits is "commercial".

Another important feature of commercial whaling under Special Permits is that not only do decisions about catch limits not apply to it, but neither do any of the numerous other regulations that are supposed to contribute to the IWC's conservation mandate, including:

- minimum size limits, by species (and, for sperm whales, by sex);
- declaration of sanctuaries, protected areas and other restricted areas;
- limitation of pelagic whaling operations in the southern hemisphere to the zone south of 40°S;
- prohibition of the killing of lactating females accompanied by their calves and of the calves themselves;
- prohibition of pelagic whaling except for minke whales;
- prohibition of the use of the "cold" (non-explosive) grenade and such other measures as might be adopted to make the hunt less inhumane;
- exemption from regulations defining the lengths of whaling seasons and the dates of opening and closing them;
- provisions requiring the submission of specified data;
- regulations intended to make hunting somewhat more humane.

Exemptions from these restrictions have, from time-to-time, been used profitably.

## **2. What Sort of Research?**

Having failed to find adequate funding for the first International Decade of Cetacean Research, the IWC's research support has been limited for several decades practically to conducting sightings surveys of minke whales in the more southerly zone of the Southern Ocean. This research has been oriented entirely to obtaining information that would be needed in case Articles 7(b) and 10(e) of the Schedule to the ICRW were to be modified in such manner as to permit internationally regulated pelagic whaling for minke whales in the Antarctic.

The research conducted for almost as long by the Government of Japan under Article VIII of the ICRW, which has involved the killing of nearly ten thousand minke whales and about 60 fin whales, has been undertaken for the same purpose and also, recently, in an absurd attempt to establish that increasing numbers of baleen whales pose a threat to world fisheries and global food security. The majority of the IWC's Scientific Committee, and the Commission itself, have repeatedly said that this "scientific whaling" has contributed little or nothing either to information needed for proper management of any renewed whaling under Article V of the ICRW or to better scientific knowledge about whales in general.

One of the main reasons for the 1982 IWC decision to set all commercial catch limits to zero for an indefinite time was to allow the depleted species and populations an opportunity to recover, not only in abundance but also to permit them eventually to reassume a more robust and natural age and sex composition. This was further reinforced by the IWC's subsequent decision, in 1994, to establish the Southern Ocean Whale Sanctuary (SOWS), covering the summer feeding grounds of an estimated 80-90% of the world's whales.

The rationale for creation of the SOWS included the need for long-term protection of all the whale species for which the IWC has acknowledged conservation responsibility, but in contrast to the 1982 decision, the SOWS proposal included the concept of ecosystem restoration, with a view to healing the Southern Ocean ecosystem as a whole. Furthermore, many IWC members were not convinced that the management procedure that had been developed within the IWC's Scientific Committee (the so-called Revised Management Procedure, RMP) following the 1982 decision would, if applied, safeguard the restoration of the deeply depleted whale stocks of the Southern Hemisphere. For a number of IWC members the SOWS was also part and parcel of a strategy of protecting the precious and unique Antarctic region as a whole. It was furthermore hoped that the creation of the sanctuary would encourage long-term non-lethal research on these populations, of a type and on a scale that had not been supported by Commission members until then.

While it is the IWC's duty to monitor the consequences of its own decisions, among them the landmark decisions of 1982 and 1994, a unique opportunity to do so in the Southern Ocean has been lost by the IWC's failure so far to organize long-term surveillance of the region.

Even the repeated circumpolar sightings surveys for minke whales must be regarded, overall, as a failure. The three sets of data have given completely different values for the numbers of minke whales and no explanation has been found for this, notwithstanding several years of effort by the Scientific Committee to identify reasons for the discrepancies and so, perhaps, find ways of improving future surveys. The Revised Management Procedure (RMP) devised by the Scientific Committee would require for its implementation reasonably good estimates of the number of whales in each of several putative management areas, and credible values for the statistical errors

of those estimates. So far neither of those needs have been met through a quarter century of counting. The minke whale surveys in the Antarctic naturally involved the sighting of other species of whales.

It is remarkable that, in addition to failing to reach a measure of agreement on the number of minke whales, the IWC Scientific Committee has made no effort to evaluate the counts of the other baleen whale species in the second and third circumpolar survey set. Some scientists did use those observations in the first circumpolar set to estimate the numbers of fin, sei, humpback and blue whales in the survey area. The counts of fin and blue whales may have a certain validity because these species have feeding distributions – almost entirely on euphausiids – largely overlapping that of the minke whales. But the counts of sei whales, which generally feed well northwards (even outside the Antarctic while still within the Southern Ocean), on different prey species (in large part copepods), tell us practically nothing about that species, which was the last of the larger baleen whales to be brought close to extinction by intense pelagic whaling in the 1960s-1970s. And, again, the distribution of humpback whales is substantially different from that of fin, minke and blue whales. It is noteworthy, however, that the estimated numbers of fin and blue whales from the first circumpolar survey set are much lower than had been found previously by other, questionable methods, such as from declines in catches per unit whaling effort.

What was the alternative route not taken? **With the same expenditure one or perhaps two sectors of the Southern Ocean (not confined to the Antarctic zone) could have been surveyed repeatedly, with greater intensity, and with the clear intention, by appropriate experimental design, of monitoring changes in the populations of all the great whales.** In this process more attention could have been given to improving the survey methodology.<sup>2</sup>

The situation is not all grey. Several studies have begun to document the beginning of the recovery of some southern hemisphere humpback populations. But again, much emphasis is being given to estimating the rate of population increase as part of an attempted revision of the agreed RMP with a view to making it less precautionary and attractive for an earlier re-opening of humpback whaling. Many other studies have improved a suite of non-lethal methods for obtaining information from live whales. The remaining difficulty of using such methods to determine whales' diets and food consumption rates has provided a further excuse for expanding the use of lethal methods for that purpose, a purpose that appears to serve only irrational claims that baleen whales are adversely affecting fisheries and should therefore be "culled", unsustainably.

While some whale species and populations appear to be increasing under protection it is not at all clear to what extent the Southern Ocean ecosystem might be expected to return to anything like its bio-diverse and biologically productive state before what Norwegian historians called "Modern whaling" began at the beginning of the 20<sup>th</sup> century. That period of unsustainable whaling – effectively "mining" renewable resources – might be treated as a huge, if uncontrolled, experiment in marine ecosystem manipulation, the intelligent, intensive, comprehensive and long-term study of which could enormously benefit human understanding of large marine ecosystems. Such a study would be procedurally, intellectually and practically challenging for a number of reasons.

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<sup>2</sup> For example, a key measure is the distance from the survey vessel that a surfacing whale is spotted. This value has always been guessed, by eye, in all weather conditions and other circumstances. Such visual guesses are, as all seamen know, notoriously inaccurate and frequently biased. It has been left entirely to scientists employed by NGOs to work to develop reliable instruments for this purpose, and prototypes have only recently been tested and become available.

One of these concerns the discovery in recent years that euphausiid ("krill") swarms occur when their food organisms, such as diatoms, are released from where they have spent a winter frozen in the sea ice by the spring melting of the ice – thus demonstrating the importance of the ice edge in the dynamics of the Southern Ocean ecosystem.

Another challenge is to understand and perhaps predict the consequences of the gradual shortening of the ice edge, which was first demonstrated by the Australian researcher, William de la Mare, from a historical study of the locations of whaling vessels, and subsequently confirmed by satellite observations. Yet another challenge is to gain understanding of the role of the micro- and nano-plankton in Southern Ocean dynamics, research on which has only recently been enhanced by technical innovations.

The period 2007-09 has been designated as an extended International Polar Year, and this will surely see a concentration of scientific attention to the Antarctic Continent and the surrounding ocean, and likely new discoveries of significance in our understanding of the dynamics of whale populations and the biology of whales. Cases in point are the evaluation of such studies as have recently been made by the *Odyssey* – operated by the NGO Ocean Alliance – of the global distribution of contaminants in the skin/blubber of whales, and of research on whale acoustics, and DNA profiles that both identify products on the market from individual whales but also – possibly of more fundamental importance – new approaches, via genetics, to the determination of the quantitative histories of whale populations and insights as to their evolution.

**ASOC is calling on Parties to the IWC, CCAMLR, the ATCM and other international bodies to adjust their collective marine research priorities for the Southern Ocean to take full account of the international community's long-term duty of care towards the Southern Ocean Whale Sanctuary and the whales, and to develop a proper Management Plan for the Sanctuary.**

### **3. Conservation Aspects of Article VIII Whaling**

When large-scale whaling by a Japanese pelagic expedition in the Antarctic, under Special Permits took off in the 1987/88 southern summer, its scale, design and possible consequences were commented on by the IWC Scientific Committee. These operations were described by their proponents as "feasibility studies" but it was never clear what exactly was actually being tested as to its feasibility. In fact, as became evident over the years, what was being tested was the feasibility of a commercial enterprise with a single rather small factory ship and a few catchers, as well as the feasibility of generating demand for the product from a domestic population that had begun to lose its immediate post-war interest in buying frozen whale meat, as well as the feasibility of ensuring continuing government subsidy for the operation in the guise of supporting scientific research.

This was not the first time that large-scale "scientific whaling" was described as a feasibility study; the term was applied in the late 1970s (1976/77 to 1978/79) when Japanese whalers were authorized by their Government to take, over three years, more than six hundred Bryde's whales (a warm-water species slightly smaller than the sei whale) in the Indian and South Pacific Oceans in waters that had long been out-of-bounds to pelagic operations. This "experiment" or "feasibility study" yielded 2626 tonnes of frozen meat and 760 tonnes of oil which conveniently entered the market just as the supplies from dwindling fin and sei whale stocks were drying up and lower Antarctic catch limits were beginning to bite. Before that most whaling countries had indulged from time to time in using Special Permits to "top up" the limited catches that were allowed by the

normal procedure of setting catch limits under Article V of the ICRW, and also to take a few endangered and hence Protected Species, but never on such a scale.

To date there have been 21 years of Japanese scientific permit whaling in the Antarctic: a two year "feasibility study" for what became the JARPA programme, followed by 16 years of JARPA, a second two-year feasibility study for JARPA 2 and so far one year of JARPA 2.

The original provision in international legal instruments, even pre-dating the negotiation of the ICRW 1946, for the issuance of permits for the taking of some whales outside the normal rules governing whaling was justified, during the negotiation of those agreements, with reference to the need to be able to provide "samples" from which skeletons of whale species could be obtained for museums, and organs and body-parts be provided for anatomical and physiological study, and the like. At no time was it contemplated that this provision would be utilized for the conduct of large-scale whaling, and still less that it would be used, as now, to provide funds for research on whales by sale of the products obtained from the "samples". It has also become obvious that the scale and type of current whaling under Article VIII of the ICRW is mainly determined by commercial and operational considerations, not scientific ones.

The IWC Scientific Committee's comments on research activities conducted under the JARPA programme ranged over many issues, but were focused mainly on whether the "research" could be expected to fulfill the declared aims, which began with a proposal to use the results to estimate the natural mortality rate of minke whales. When it was demonstrated that this was not possible the declared objective was switched to the more general one of providing data that would make a new kind of management procedure that was being developed more efficient. Again, the Scientific Committee showed that such a consequence was unlikely. This process led to concentration of the Committee's advice on two questions: was it reasonable to expect that data from Special Permit whaling to lead to better management (most scientists thought it would not) and would the proposed catches impact the whale populations sufficiently to cause concern? The answer to this second question was impeded by the "feasibility study" claim, since no long-term plan for catching was presented; thus all assessments applied to the possible effects of some catches for one or a few years, and these were generally considered to be small relative to the number of minke whales then thought to be feeding in the southern hemisphere.

Because the JARPA programs are split into packets of a few years each the Scientific Committee could not be asked to evaluate the consequences of a very long-term Article VIII whaling enterprise. Later, as we have seen, optimism about estimating those numbers was shattered by huge discrepancies between successive minke whale surveys. It is thus no longer possible to assess, in advance, the long-term consequences arising simply from removals of certain numbers of animals. But the effects could not, in any case, be scientifically assessed by counting alone.

A feature of the minke whaling operations to which the Scientific Committee has paid little attention is the composition of the catches, by age/size and sex. For our purposes here it is necessary first to review that feature.<sup>3</sup>

In the fourteen seasons from 1991/92 to 2004/05 5621 minke whales were killed in the Southern Ocean under Special Permits. In the first four seasons of this period the kill did not exceed 330 annually. The permitted number was increased to 440 for the 1995/96 season, and remained at that

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<sup>3</sup> We are grateful for help by Mr. John Frizell, who generously provided Dr. Holt with excellent summaries of data made public by the Institute for Cetacean Research (which conducts the whaling operations and markets the products as well as employing the scientists involved).

level until and including 2004/05. (Occasionally the "quota" could not be reached, especially in 1998/98) At that time the Scientific Committee was involved in what might be described as a scholastic discussion about what would really be appropriate numbers of whales to kill to achieve the stated objectives of the JARPA programme, not realizing that the number was in reality determined so as to assure the refrigerated hold of the *Nisshin Maru* would be filled.

In the period 1995/96-2004/05 4346 minke whales were killed. They yielded an annual average of 1863 tonnes of edible product, almost all frozen meat. A few tonnes of "whale oil" (the technical name for the edible oil produced from baleen whales) were produced in 1993/94-1997/98 and used as fuel in the factory ship's engines. It so happens that the processing (refrigerating) and cold-storage capacity of the factory ship is about 2000 tonnes, so that the "feasibility study" was successful in demonstrating what was needed to operate efficiently, filling capacity by the end of the working season – which is of course largely determined by Antarctic weather conditions as the southern winter approaches.

The kill was increased to 853 for the 2005/06 season, and yielded 3172 tonnes of meat. This was somewhat less than might have been expected, because the yield per whale declined to 3.72 tonnes, from a previous average of 4.25 tonnes per minke whale, i.e. by 13%. We shall examine (in the appended Note to this paper) how that could happen. But in that season permits were given for 10 fin whales to be killed. These yielded an additional 269 tonnes of meat. The seasonal total of 3441 tonnes was well-over the factory ship's capacity and necessitated charter of an auxiliary transport vessel to off-load some of the meat at sea and take it back to Japan. This can be regarded as another "feasibility test" and it was planned to put the result of the test into effect in the 2007/08 season by increasing the permitted minke catch to 935 and of fin whales to 50. If the yields were the same as in 2005/06 the total meat production would be 3840 tonnes, which would fit neatly into two loadings of the factory ship.<sup>4</sup>

It is not surprising that media reports have recently appeared in Japan hinting that the commissioning of another, bigger, factory ship is now being discussed. When the intended capacity of this vessel (and whether it is to replace or supplement *Nisshin Maru*) becomes public knowledge it will be easy to guess what will be the necessary size and species composition of the "scientific samples" in the next phase of the expansion of Article VIII whaling.

It should also be said that while the taking of "representative samples" might in some situations be justified in terms of the study of population dynamics the taking of large numbers of immature, juvenile animals in what is in fact full-scale whaling for commercial purposes (including the purpose of raising funds for further research), practically nullifies the protective regulations not only of the IWC but even those made by whaling companies early in the 20<sup>th</sup> century.

#### **4. Other Issues Concerning Whaling**

##### **4.1 Pollution by organic wastes**

The Japanese factory ship, the *Nisshin Maru*, that has for many years been processing minke whales, and recently also fin whales, killed in Antarctic waters under Special Permits, does not,

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<sup>4</sup> It had been proposed also to kill 50 humpback whales – a charismatic species for whale-watchers and scientists – in this season, but the proposal was withdrawn at the last minute. It is unclear whether there was a real intention to kill humpbacks or whether the proposal was a negotiating ruse. If the expedition had gone ahead with the humpback kill it would have added approximately a further 1000 tonnes to the total meat yield. That would have produced a potentially embarrassing surplus, perhaps adding weight to the hypothesis that it had never been intended to kill them.

unlike previous bigger factories, carry facilities for preparing and storing non-edible products from the carcasses of whales. It also has minimal facilities for extracting and storing edible whale oil, nearly half of which is contained not in the subcutaneous blubber but in the bones and internal organs. The residues left after meat has been flensed and occasionally after some oil has been obtained by rendering some of the blubber constitute between 30 and 56% of the body weight. These residues are routinely thrown overboard while the vessel is moving through Antarctic waters, usually south of 60°S latitude.

This form of continuous pollution of the high seas is contrary to IMO and Antarctic Treaty guidelines and provisions. This activity is not reported to any international authority. Fragmentary information released by the government of Japan to the IWC in reports of its JARPA programme show that the amount of waste material dumped during the 2005/06 whaling operations totaled about 2300 tonnes, derived from 853 minke whales and ten fin whales. In previous years since 1987/88 the quantity dumped has been about half that. For the 2007/08 season the projected minke catch has increased to about 1000 animals and the fin whale catch to 50. The waste dumped will therefore be close to 4000 tonnes, still unreported and, in our view, illegal.<sup>5</sup>

#### **4.2 Potential pollution by fuel oil**

The 8000-ton factory ship *Nisshin Maru* has only about 2000 tonnes freezer capacity. It came into service in 1992, replacing the 20,000 ton *Nisshin Maru 3*. From the beginning the new ship was not big enough to carry extra fuel for itself and its accompanying catchers, so auxiliary supplies conveyed by sea were needed. When, in mid-season, the factory ship and the auxiliary transport vessel meet at sea, fuel is transferred by hose from the auxiliary to the factory. In the current season (2007/08) three such transfers were observed taking place in the Antarctic south of 60°S.<sup>6</sup> With the recent increases in the numbers and species of whales killed under Special Permits it has become necessary for frozen meat to be off-loaded in mid-season, at sea, to a chartered refrigerated transport vessel, usually one flying a flag of convenience. This is another potential source of accidents and incidents in the Southern Ocean that are related to whaling activities.

Regarding the type of fuel oil used on the vessels involved, no registry presently exists that tracks this important aspect of oil spill prevention in the Southern Ocean, either for whaling or fishing vessels.

#### **4.3 Meat Yields and Juvenile Whales**

The edible products and meat yields per whale depend on the size and sex compositions of the catches. Females are bigger than males of the same age, and the average size of females in the population and hence in catches is always bigger than that of males, notwithstanding a probable difference in the natural mortality rates of the sexes. The sex composition of baleen whale catches cannot be controlled by the gunners on the catcher vessels as the sex cannot be identified until after death. It can be controlled to a limited extent by selection of the whaling grounds because there is some natural segregation by sex, at certain times in most species, effected in part by differences in the arrival date on the feeding ground. The sizes of animals taken can, however, be controlled visually; if that were not possible there would be no point in setting minimum size limits.

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<sup>5</sup> Within the "Special Area" designated in 1990 by IMO under Annex I (oil) of MARPOL 73/78, the disposal, at sea or on shore, of oily residues or chemicals from ships is banned.

<sup>6</sup> Within the "Special Area" designated in 1990 by IMO under Annex V (garbage) of MARPOL 73/78, the disposal, at sea or on shore, of garbage from ships is banned.

The JARPA Reports presented to the IWC by the ICR provide a doubly useful, though indirect, indication of size composition by giving the numbers of mature and immature animals, by sex, in the catches. The sex ratios, and relative numbers of sexually mature and immature whales killed were similar in the eight 440-seasons 1996/97-2004/5, but excluding 2000/01 (Data for the tenth, 1995/96 were not available) but the sex ratio was distinctly different in 2000/01. The mature-immature ratio in the large catch in 2005/06 was practically the same as in the catches in previous years but the sex ratio, and especially of the immature whales, was very different. Table 1, below illustrates this pattern.

In commercial catches of minke whales taken in earlier years in accordance with ICRW Article V the animals recorded as immature were generally only a little smaller than the mature ones, notwithstanding the absence of a minimum size limit for this species. In the Special Permit catches, however, the immature animals, of both sexes, are both numerous (nearly 20% of the total except in the anomalous 2006/07 catch) and much smaller than the mature animals. Table 2, illustrates this. The average weight of all whales (both sexes, mature and immature) in the recent years 2000/01 to 2005/06 was fairly constant at about 6.3 tonnes.

**Table 1. Compositions of minke whale kills in the Antarctic under Special Permits**

Sex State		M Imm.	M Mat.	F Imm.	F Mat.	M All	F All	Both Imm.	Both Mat.
<b>Seasons</b>	<b>No.</b>								
2000/01	440	15	43	12	29	59	41	28	72
<u>1996/97[1] –</u>	<u>3906</u>	<u>12</u>	<u>39</u>	<u>17</u>	<u>32</u>	<u>51</u>	<u>49</u>	<u>30</u>	<u>70</u>
<u>2004/05</u>									
2005/06	853	11	43	18	28	54	46	29	71
2006/07	503	6	25	13	56	31	69	18	82

[1] Excluding 2000/01

**Table 2. Average weights, in tonnes, of 6777 minke whales killed in the Antarctic in Japan's Article VIII whaling from 1991/92 to 2005/06**

	Immature	Mature
Males	2.9	6.8
Females	3.8	8.1

The implications of these figures are (1) about 2000 immature – probably mostly juvenile animals and calves, and a majority of them females – have been killed prematurely, and to this extent the subsequent breeding population impaired with practically no benefit, at least in meat production; and (2) animals that mostly would have survived (the natural mortality rate around the age of maturity being quite low) have been prevented from more than doubling in size and meat yield potential. Thus, from the points of view of the economics of commercial whaling, and also of conservation, large-scale and long-term whaling under Article VIII rules is a poor alternative to regulated whaling under Article V. It is evident that it is not sufficient to assess the effects of Article VIII whaling merely in terms of the numbers of animals removed, as has been the IWC's practice.