

Editorial

This issue of the Journal follows the 2004 meeting of the International Whaling Commission held in Sorrento, Italy. Details of the Commission meeting will be published in the next *Annual Report of the International Whaling Commission*. The full report of the Scientific Committee will be published in spring 2005 as *J. Cetacean Res. Manage.* 7 (Suppl.). However, as is now traditional, here follows a short summary of the work of the Scientific Committee at the recent annual meeting.

REVISED MANAGEMENT PROCEDURE

After the adoption of the moratorium on commercial whaling in 1982, the Committee spent over eight years developing the Revised Management Procedure (RMP) for baleen whales (IWC, 1999b). In brief, the RMP is a generic management procedure designed to estimate safe catch limits for commercial whaling of baleen whales. This was adopted some time ago by the Commission (IWC, 1993). However, the Commission has stated that it will not set catch limits for commercial whaling for any stocks until it has agreed and adopted a complete Revised Management Scheme (RMS). The RMS will also include a number of non-scientific matters, including inspection and enforcement. This has been the subject of a considerable amount of discussion within the Commission. The Commission received a proposal by the Chair for an RMS package of measures that he believed was a fair and balanced approach to move to the rapid completion of the RMS. Discussion of this will form a key part of the work of the Commission's RMS Working Group during the period leading up to the 2005 meeting in Ulsan, Korea.

Implementation Simulation Trials

Implementation Simulation Trials are trials that are carried out before using the RMP to calculate a catch limit and involve investigating the full range of plausible hypotheses related to a specific species and geographic area, particularly with respect to issues of stock structure.

The process of developing *Implementation Simulation Trials* is not the same as identifying the 'best' assessment for the species/region, but involves considering a set of alternative models to examine a broad range of uncertainties with a view to excluding variants of the RMP that show performance that is not sufficiently robust across the trials. Account needs to be taken of the plausibility of the various trial scenarios when evaluating RMP variants.

In the light of difficulties experienced in recent years, particularly with respect to the North Pacific region (common minke whales and Bryde's whales), the Committee has spent some time discussing the general question of how best to ensure that the process of carrying out *Implementations* (or *Implementation Reviews*) is efficient and prompt, whilst taking into account the available information. To achieve this it agreed that they should be conducted at discrete intervals, using the data available at one point in time. This year, the Committee reviewed the process from '*pre-Implementation Assessment*' to initial *Implementation* and *Implementation Reviews* based on the experience gained thus far, and particularly with

respect to the difficulties faced during the *Implementation* process for western North Pacific common minke whales. As a result it developed a document detailing the requirements and guidelines for the *Implementation* process. The Committee also updated its document detailing Requirements and Guidelines for Conducting Surveys and Analysing Data within the Revised Management Procedure.

North Pacific Bryde's whales

The Committee has made relatively slow progress on completing the *Implementation* for western North Pacific Bryde's whales *inter alia* due to its heavy workload. While noting that it was in the *pre-Implementation Assessment* stage, the Committee noted the considerable work already undertaken and agreed that it should be possible to move faster towards *Implementation* than would be the case for new situations. For a number of reasons, the Committee did not make as much progress as it had hoped on this issue in Sorrento. In order to ensure progress during the coming year it therefore agreed to hold an intersessional Workshop before the next annual meeting.

North Atlantic fin whales

The Committee reviewed the available information in order to determine whether there was sufficient information to warrant the initiation of a *pre-Implementation Assessment* for North Atlantic fin whales. It agreed that there was and the Commission agreed with its recommendation that the Committee initiate the *pre-Implementation Assessment*. This will begin at next year's annual meeting.

Bycatches of large whales

The RMP estimates a limit for the number of non-natural removals, not simply a catch limit for commercial whaling. It is therefore important to estimate the numbers of whales removed from the population by indirect means including for example bycatches in fishing gear and ship strikes.

The Scientific Committee began to consider this issue in some detail three years ago. It agreed that priority should be given to those areas where the RMP is likely to be implemented – such as the northwestern Pacific and the northeastern Atlantic. Four steps are required: (1) identification of the relevant fisheries; (2) description and categorisation of those fisheries to allow a sampling scheme to be devised; (3) identification of a suitable sampling strategy or strategies; and (4) design and implementation of the sampling scheme to enable estimation of the total bycatch.

The Committee has reviewed general methods for estimating bycatches. These fall under two headings: (1) those based on fisheries data and observer programmes; and (2) those based on genetic data. The former have been used successfully for several small cetacean populations. The Committee agreed that independent observer schemes are generally the most reliable means of estimating bycatch rates in a statistically rigorous manner, but that they may not always be practical and will require careful design.

Genetic approaches potentially represent a new way of estimating bycatches. The Committee has agreed that although genetic methods based on market samples may not

be the primary approach to estimating bycatch, they could provide useful supplementary data that could not be obtained in another way. The use of market samples to provide absolute estimates should not be ruled out. However, it will require further developments in sampling design with input from experts with detailed knowledge of market sampling issues. A proposal for a Workshop on that subject was developed and this Workshop will be held immediately prior to the next annual meeting in Ulsan, Korea. The objectives of the Workshop are:

- (1) to review available methods that have been used to provide estimates of large cetacean bycatches via market samples, including a consideration of their associated confidence intervals in the context of the RMP;
- (2) to provide advice as to whether market-sampling-based methods can be used to reliably estimate bycatch for use in addressing the Commission's objectives regarding total removals over time and, if so, the requirements for such methods.

It was also noted that the Workshop will be interested in the question of markets only insofar as determining whether or not such data can be used to provide reliable estimates of bycatch.

Work to further explore improved bycatch estimation methods for the two approaches noted above is continuing. Improved data reporting for large whale bycatches was also recommended and a *pro-forma* developed.

REGIONAL WORKSHOPS TO ADDRESS CETACEAN BYCATCH ISSUES

Outside the context of the RMP, the IWC Scientific Committee and others have identified the incidental capture of cetaceans in fishing gear as one of the most important threats to the conservation and management of their populations and it is known to be a significant threat to survival in certain cases (e.g. the North Atlantic right whale, the vaquita). In order to address the full management implications, reliable information is needed on bycatch numbers, stock identity and movements, the abundance of the affected population(s), and the population dynamics of the cetaceans.

In some areas, considerable advances have been made in the assessment and mitigation of cetacean bycatch since the pioneering IWC La Jolla Workshop held in 1990 (Perrin *et al.*, 1994). In other areas, however, little progress has been made and, as a result, a growing number of cetacean species (both large and small) face critical conservation problems as a result of fisheries bycatch. Rather than holding another large generic Workshop, the Committee agreed that given the case- and area-specific nature of the problem, a series of broad-based regional Workshops would be more effective, focusing on regions where bycatch problems:

- (1) have been given priority by the Scientific Committee as part of its normal review process; and
- (2) are not already being addressed.

The general objectives of such Workshops will be to develop a short- and long-term approach to the successful management and mitigation of the cetacean bycatch problems in the region, building upon work already undertaken by the Committee. The Committee agreed a mechanism whereby this process can be facilitated. It also recommended collaboration with other organisations with an interest in this matter (e.g. the Convention on Migratory

Species, the Committee on Fisheries of the UN Food and Agriculture Organisation, IUCN and relevant international and regional fishery organisations).

DEVELOPMENT OF AN ABORIGINAL WHALING MANAGEMENT PROCEDURE

With the completion of the RMP, the Commission asked the Scientific Committee to begin the process of developing a new procedure for the management of aboriginal subsistence whaling. Such a procedure must take into account the different management objectives for such whaling when compared to commercial whaling. This is an iterative and ongoing effort. The Commission will establish an Aboriginal Whaling Scheme that comprises the scientific and logistical (e.g. inspection/observation) aspects of the management of all aboriginal fisheries. Within this, the scientific component might comprise some general aspects common to all fisheries (e.g. guidelines and requirements for surveys and for data c.f. the RMP) and an overall AWMP within which there will be common components and case-specific components.

At the 2002 meeting, the Committee completed its work with respect to the Bering-Chukchi-Beaufort Seas stock of bowhead whales. It agreed a *Strike Limit Algorithm (SLA)* for bowhead whales and the scientific aspects of a Scheme; this was adopted by the Commission. It noted that should the Commission decide, it would be possible to apply the *Bowhead SLA* at that meeting. After considerable work and two intersessional Workshops, the Committee made a formal recommendation to the Commission for a *Strike Limit Algorithm* for gray whales in Sorrento. It believed that this *Gray Whale SLA* met the objectives of the Commission set out in 1994 and represented the best scientific advice that the Committee could offer the Commission with respect to the management of the Eastern North Pacific stock of gray whales. This was adopted by the Commission.

The situation for the Greenlandic fisheries for fin and minke whales is less promising. A considerable amount of research, especially concerning stock identity, is required and to this end, the Committee has developed a research programme in cooperation with Greenlandic scientists (see below). High priority is being accorded to this work and should sufficient data become available, an intersessional Workshop will be held before the next annual meeting to review progress.

ASSESSMENT OF STOCKS SUBJECT TO ABORIGINAL SUBSISTENCE WHALING

Aboriginal subsistence whaling is permitted for Denmark (Greenland, fin and minke whales), the Russian Federation (Siberia, gray and bowhead whales), St Vincent and The Grenadines (Bequia, humpback whales) and the USA (Alaska, bowhead and gray whales). It is the responsibility of the Committee to provide scientific advice on safe catch limits for such stocks. Until the AWMP is completed the Committee continues to provide advice on an *ad hoc* basis, carrying out major reviews according to the needs of the Commission in terms of establishing catch limits and the availability of data. It also carries out brief annual reviews of each stock.

The present catch limits had been set up to the 2002 season and so at the 2002 meeting, the Committee had to provide management advice for all of the stocks considered. The Commission sets catch limits based on the scientific advice and a 'need' statement from the countries involved.

Eastern gray whales

In 2002, the primary assessment carried out was for the eastern gray whale population (Issue 1 of volume 4 of the *Journal* was devoted to gray whale papers). New information on abundance, distribution, catches and ecology was presented. The population is believed to be close to carrying capacity. The Committee agreed that an annual take of up to 463 whales was acceptable; based on the submitted need statement, the Commission set a total catch limit for the 2003-6 seasons of 620 with a maximum of 140 in any one year. The Committee confirmed this advice this year.

Bering-Chukchi-Beaufort Seas stock of bowhead whales

In addition to the work on the *Bowhead SLA*, the Committee has also been examining the status of the Bering-Chukchi-Beaufort Seas stock of bowhead whales. New information in 2002 included a preliminary abundance estimate for 2001 of 9,860 (95%CI 7,700–12,600) giving a rate of increase between 1978 and 2002 of 3.3% (95%CI 2%–4.7%). This year the Committee undertook an in-depth assessment. The primary focus of the in-depth assessment was: (a) the data required for the *Bowhead SLA*; and (b) examination of whether the present situation is within the tested parameter space for that *SLA*. The latter effort included consideration of such issues as stock identity and biological parameters.

The discussions of uncertainty over stock structure issues made it clear that these must form a major component of the forthcoming *Implementation Review*. This *Implementation Review* will begin at the 2006 annual meeting and will examine in particular the robustness of the *Bowhead SLA* with respect to plausible stock hypotheses via simulation trials. If shown to be necessary, this may result in changes to the *Bowhead SLA*. Management advice will be provided at the 2007 meeting based on the best science then available. In providing advice at this year's meeting, the Committee noted:

- (1) the continuing increase in the abundance estimates derived from the census under the recent catch limits and record high calf counts;
- (2) the spatio-temporal distribution and opportunistic nature of the hunt and the low numbers of whales struck annually in St. Lawrence Island and Chukotka; and
- (3) the development of an extensive research programme that will address questions of stock structure and allow the formulation of one or more plausible stock structure hypotheses.

Given this, the Committee agreed that the *Bowhead SLA* remains the most appropriate tool for providing management advice for this harvest, at least in the short-term. The results of its application at this meeting showed that no change is needed to the current block quota for 2003-2007.

Minke and fin whales off West Greenland

In 2002, at the Commission, the same catch limits as previously in force were agreed by the Commission for the 2003-6 period, i.e. West Greenland minke whales – an annual limit of up to 175 strikes; East Greenland minke whales – an annual catch of up to 12 animals; West Greenland fin whales – an annual catch of up to 19 whales. The Committee had been unable to provide scientific advice on safe catch limits and once again this year, the Committee received little new information on stocks of minke and fin whales off West Greenland. It stressed that this inability to provide any advice on safe catch limits is a matter of great

concern, particularly in the case of fin whales where the best available abundance estimate dates from 1987/88 and is only 1,096 (95% CI 520-2,100); that for West Greenland common minke whales dates from 1993 and is 8,371 (95% CI 2,400–16,900). The Committee noted that an abundance survey would be undertaken this year.

The Committee stressed that obtaining adequate information for management must be seen as of very high priority by both the national authorities and the Commission. Without this information, the Committee will not be able to provide safe management advice in accord with the Commission's management objectives, or develop a reliable *SLA* for many years, with potentially serious consequences for the status of the stocks involved. In particular, the Committee advised the Commission that in the absence of an agreed abundance estimate for fin whales arising out of the forthcoming survey, it will probably recommend immediately that the take of fin whales off West Greenland be reduced or eliminated.

Humpback whales off St Vincent and the Grenadines

In 2002, after considerable debate in the Commission, a catch limit of up to 20 whales for the period 2003-7 was agreed (the Scientific Committee must review this in 2005). This year, the Committee repeated that it believes it is most plausible that eastern Caribbean humpbacks are part of the West Indies breeding population (abundance in 1992/93 – 11,570, 95%CI 10,100–13,200). It recommended further collection of relevant data to confirm this. It also agreed that the catch limit set by the Commission would not harm the stock if it is part of the West Indies breeding population.

HISTORIC ABUNDANCE ESTIMATION, GENETIC METHODS

In the light of a paper by Roman and Palumbi (2003), the Committee agreed to consider the general methodological issue of estimating *K* and/or pre-exploitation population size in the context of the Committee's assessment work, as well as to provide its view on the conclusions of the paper. The Committee was pleased that Palumbi was able to attend the meeting.

As a result of its discussions, the Committee agreed that such genetic methods have the potential to be one of a suite of tools that can be used to examine pre-exploitation abundance. However, it noted that there are a number of limitations and uncertainties that must be considered when examining such data in a present-day management context as discussed above.

In view of this, the Committee agreed that the estimates of historic abundance provided in Roman and Palumbi (2003) for the initial pre-whaling population sizes of humpback, fin and common minke whales in the North Atlantic have considerably more uncertainty than reported, and in particular can not be considered reliable estimates of immediate pre-whaling population size. Particularly important in this regard is the mismatch between the time-period to which genetic estimates apply (i.e. the time period is difficult to determine and extremely wide) and the population sizes of whales immediately prior to exploitation. It also agreed that the paper provides no information to suggest that changes are required in either the RMP or AWMP approaches to management.

The Committee also identified further work necessary to assess if genetically-based estimates of 'initial' abundance can provide useful information for the management of cetaceans.

STOCK IDENTITY

Of general concern to the assessment of any cetaceans is the question of stock identity. Examination of this concept in the context of management plays an important role in much of the Committee's work, whether in the context of the RMP, AWMP or general conservation and management. In recognition of this, the Committee has established a Working Group to review theoretical and practical aspects of the stock concept in a management context. The Committee has noted that it is important in any application of stock structure methods, to examine the sensitivity of conclusions to different *a priori* decisions about the definition of initial units, to ascertain which population structure hypotheses to examine.

A specialist Workshop to examine the use of simulation testing to assess the performance of methods to identify population structure was held in January 2003 and discussed at the annual meeting later that year. The Workshop developed a suitable simulation framework to allow evaluation of genetic methods used in inferring population structure both in general terms (the issue is of great relevance to conservation and management outside the IWC) and from a specifically IWC viewpoint (particularly in an RMP/AWMP context).

It was recognised that such a complex project must proceed in an iterative fashion and the Workshop concentrated on specifying the various modular tasks needed for Phase I of the process (c.f. *Initial Exploration Trials* in the AWMP process), for which some results might be expected within a year, while also identifying the types of scenarios that would need to be covered in Phase II and beyond. The Workshop report was published in *J. Cetacean Res. Manage.* 6 (Suppl.). This year the Committee reviewed progress under Phase I of the TOSSM project (Testing Of Spatial Structure Models). It was pleased to see that great progress had been made on the most challenging module, i.e. the development and validation of a program to simulate realistic genetic datasets. Preliminary testing of various methods under certain simple scenarios will begin during the intersessional period.

COMPREHENSIVE ASSESSMENT OF WHALE STOCKS

The 'Comprehensive Assessment' of whale stocks

The development of the concept of the 'Comprehensive Assessment' is reviewed in Donovan (1989). It can be considered as an in-depth evaluation of the status of all whale stocks in the light of management objectives and procedures; this would include the examination of current stock size, recent population trends, carrying capacity and productivity. Clearly, it is not possible to 'comprehensively assess' all whale stocks simultaneously, and the Committee has been working in an iterative manner towards this, initially concentrating on stocks that have recently or are presently being subject to either commercial or aboriginal subsistence whaling. Some of these stocks have already been discussed in the sections on the RMP and AWMP.

Antarctic minke whales

The Committee has carried out annual surveys in the Antarctic (south of 60°S) since the late 1970s. The last agreed estimates for each of the six management Areas for minke whales (see Donovan, 1991) were for the period 1982/83 to 1989/90 (IWC, 1991). At the 2000 meeting, the

Committee agreed that whilst these represented the best estimates for the years surveyed, they were no longer appropriate as estimates of current abundance. An initial analysis of available recent data had suggested that current estimates might be appreciably lower than the previous estimates (e.g. see Branch and Butterworth, 2001).

Subsequently, considerable time has been spent considering Antarctic minke whales with a view to obtaining final estimates of abundance and considering any trend in these. This has included a review of data collection methods and analytical methodology. After considering many of the factors affecting abundance estimates, there is still evidence of a decline in the abundance *estimates*, although it is not clear how this reflects any *actual* change in minke abundance. Three hypotheses that might explain these results have been identified:

- (1) a real change in minke abundance;
- (2) changes in the proportion of the population present in the survey region at the time of the survey;
- (3) changes in the survey process over time that compromise the comparability of estimates across years.

A considerable amount of work has been undertaken and further work is ongoing. The final part of the Third Circumpolar Survey undertaken as part of the IWC's SOWER research programme has been completed. This work will again be a priority item for discussion at next year's meeting. Particular attention will be given to the potential relationship between minke whale distribution and the extent and nature of sea ice.

Southern Hemisphere blue whales

The Committee is beginning the process of reviewing the status of Southern Hemisphere blue whales. An important part of this work is to try to develop methods to identify pygmy blue whales from 'true' blue whales at sea (IWC, 1999a) and progress is being made on this. Work on genetic and acoustic differentiation techniques is continuing and there is considerable progress with morphological methods. The Committee has agreed on a number of issues that need to be resolved before it is in a position to carry out an assessment, which it believes should commence in 2006. This year, the Committee reviewed a paper by Branch *et al.* (In Press). The Committee agreed that this research supported the conclusions that: (1) on average, the Antarctic blue whale population is increasing at a mean rate of 7.3% per annum (95% CI 1.4–11.6%); (2) had an estimated circumpolar population size of 1,700 (95% CI 860–2,900) in 1996; and (3) that this population is still severely depleted with the 1996 population estimate estimated to be at 0.7% (95% CI 0.3–1.3%) of the estimated pre-exploitation level.

Southern Hemisphere humpback whales

Considerable progress has been made in recent years in working towards an assessment of humpback whales. Attention has focussed both on data from historic whaling operations and on newly acquired photo-identification, biopsy and sightings data. The Committee made a number of research recommendations to further progress towards an assessment. An intersessional group was established last year to review progress and determine whether it is feasible to set a deadline for the assessment to be completed. Further work was identified this year and progress was reviewed. Further work remains to be completed.

North Atlantic right whales

The Committee has paid particular attention to the status of the North Atlantic right whale in the western North Atlantic in recent years (e.g. see special issue 2 of the Journal *Right whales: worldwide status*). The Committee is extremely concerned about this population, which, whilst probably the only potentially viable population of this species, is in serious danger (*ca* 300 animals). By any management criteria applied by the IWC in terms of either commercial whaling or aboriginal subsistence whaling, there should be no direct anthropogenic removals from this stock.

This year, the Committee once again noted that individuals from this stock are continuing to die or become seriously injured as a result of becoming entangled in fishing gear or being struck by ships. It repeated that it is a matter of absolute urgency that every effort be made to reduce anthropogenic mortality in this population to zero. This is perhaps the only way in which its chances of survival can be directly improved. There is no need to wait for further research before implementing any currently available management actions that can reduce anthropogenic mortalities.

The Committee reviewed progress on a number of research and management recommendations concerning this stock.

Western North Pacific gray whales

This is one of the most endangered populations of great whales in the world. It numbers less than 100 animals (see the paper by Weller *et al.*, 2002) and there are a number of proposed oil and gas-related projects in and near its only known feeding ground. The Committee held a Workshop in October 2002 to review this further. The Workshop report was published in *J. Cetacean Res. Manage.* 6 (Suppl.). Overall, the Workshop agreed with the conclusions of previous reviews on western gray whales. Specifically, that the population is very small, and suffers from a low number of reproductive females, low calf survival, male-biased sex ratio, dependence upon a restricted feeding area and apparent nutritional stress (as reflected in a large number of skinny whales). Other major potential concerns include behavioural reactions to noise (notably in light of increasing industrial activity in the area) and the threat of an oil spill off Sakhalin which could cover all or part of the Piltun area and thus potentially exclude animals from this feeding ground. The Workshop had noted that assessments of the potential impact of any single threat to the survival and reproduction of western gray whales were insufficient and had strongly recommended that risk assessments consider the cumulative impact of multiple threats (from both natural and anthropogenic sources). Last year, the Committee adopted the Workshop report and endorsed its recommendations, including the research and monitoring plan.

In reviewing progress this year, the Committee noted with great concern that the evidence is compelling that this population is in serious danger of extinction. It reiterated that the population is small (only about 100 whales) and appears to have biological problems (only 23 reproductive females, three or more years calving interval, male biased sex ratio, and apparent low calf survival). Furthermore, there is only a single known coastal feeding habitat (approximately 60km long and 5km wide) used by females and calves which faces an obvious and immediate threat from industrial activities, including noise, vessel traffic and the potential for a catastrophic oil spill. Noting, its similarly strong concerns for North Atlantic right whales, the

Committee recommended as a matter of absolute urgency that measures be taken to protect this population and its habitat off Sakhalin Island.

Plans for the Russia-USA research collaboration and national research plans from Russia and Korea were presented. As in previous years, the Committee strongly recommended that the ongoing Russia-USA and Russian and Korean national programmes on western gray whale research and monitoring continue and expand into the future. Results from these programmes will be the only way to monitor and assess the status of this critically endangered population.

The Committee also strongly recommended that all range states develop or expand national monitoring and research programmes on western gray whales. The Committee noted particularly that the precise location and status of the breeding grounds of this highly endangered whale (presumably in Chinese waters) are still unknown.

EFFECTS OF ENVIRONMENTAL CHANGE ON CETACEANS

There is an increasing awareness that whales should not be considered in isolation but as part of the marine environment; detrimental changes to their habitat may pose a serious threat to whale stocks. The Committee has examined this issue in the context of the RMP and agreed that the RMP adequately addresses such concerns. However, it has also emphasised that the species most vulnerable to environmental threats might well be those reduced to levels at which the RMP, even if applied, would result in zero catches (IWC, 1994). Over a period of several years, the Committee has developed two multi-national, multi-disciplinary research proposals. One of these, POLLUTION 2000+ (Reijnders *et al.*, 1999) has two aims: to determine whether predictive and quantitative relationships exist between biomarkers (of exposure to and/or effect of PCBs) and PCB levels in certain tissues; and to validate/calibrate sampling and analytical techniques. The other, SOWER 2000 (IWC, 2000) aims to examine the influence of temporal and spatial variability in the physical and biological Antarctic environment on the distribution, abundance and migration of whales. Progress reports on both of these programmes were considered at this year's meeting.

Given the emergent threat of anthropogenic sound on cetaceans and other elements of marine ecosystems and also the potential for the Committee to assist in the development and interpretation of studies aimed at elucidating the potential impacts of anthropogenic noise on cetaceans, the Committee held a mini-symposium at this year's meeting, with presentations on the following topics: (a) the effects of anthropogenic noise on marine animals and the possible synergistic effects between ambient ocean noise levels and other environmental stressors; (b) physical acoustics and ambient noise in the ocean; (c) audition and the physiology of hearing in cetaceans and the effects of intense sounds on cetacean hearing; and (d) whale communication behaviour.

In conclusion, the Committee noted with great concern the impact on large whales in critical habitats of exposure to seismic sounds impulses, particularly with respect to severely threatened populations such as the western gray whale. It agreed that there is now compelling evidence implicating that military sonar has a direct impact on beaked whales in particular. It also agreed that evidence of increased sounds from other sources, including ships and seismic activities, were cause for serious concern. The

potential for cumulative or synergistic effects of sounds, as found in other taxa, with non-acoustic anthropogenic stressors was noted. A number of detailed recommendations were made.

The Committee was pleased to hear that an intersessional Workshop on Habitat Degradation will take place in November 2004 at the University of Siena, Italy.

SMALL CETACEANS

Despite disagreement within the Commission over the management responsibilities of the IWC with respect to small cetaceans, it has been agreed that the Scientific Committee can study and provide advice on them. As part of this programme, the Committee has reviewed the biology and status of a number of species and carried out major reviews of significant directed and incidental catches of small cetaceans (Bjørge *et al.*, 1994).

In 2001, the Government of Japan had indicated that it would no longer co-operate with the Committee on small cetacean related matters. In 2002, the Committee referred to the great value of the information provided by the Government of Japan on the status of small cetaceans in previous years and respectfully requested that the Government of Japan reconsider its position on this matter and resume the valuable contribution of Japanese scientists to its work on small cetaceans. Unfortunately, this has not yet happened.

This year, the primary topic considered was the franciscana. The franciscana is found along the Atlantic coasts of Brazil, Uruguay and Argentina, from approximately 18° to 42°S. The Committee reviewed available information on stock structure, abundance, life history, ecology, incidental catches and status. It made a number of research recommendations given the paucity of information for some areas. Bycatch in gillnet fisheries occurs throughout the range of the franciscana. The Committee expressed its concern that in some areas, annual removal rates due to bycatch were between about 1.6 and 3.3% exceeding the 1% removal level determined by the Committee as sufficient to warrant concern regarding the status of small cetaceans.

The Committee referred to its endorsement of the concept of a series of regional Workshops with the general objectives of developing a short- and long-term approach to the successful management and mitigation of the cetacean bycatch problems in a region, building upon work already undertaken by the Committee (see section on Regional Workshops).

The Committee also reviewed progress on previous recommendations it had made, particularly those concerning the critically endangered baiji and vaquita. The Committee received some information from China and welcomed the initiatives being taken, although it noted that the prospects for the baiji remain extremely poor.

The Committee has followed with considerable interest progress on conservation of the highly endangered vaquita (*Phocoena sinus*); several members of the Committee also serve on the International Committee for the Recovery of the Vaquita (CIRVA). This year the Committee reviewed the report of the third meeting of CIRVA. The Committee reiterated its endorsement of the fundamental conclusions drawn by CIRVA – that the current grave conservation status of this species is due to fisheries bycatch. The Committee noted at least six records of bycatch in the past

seven months and, in general, was disheartened by the lack of any substantial progress in reducing bycatches since last year's meeting. Therefore, the Committee urged the Government of Mexico to implement the previous recommendations of CIRVA and to take immediate action to eliminate the bycatch of this species in the northern Gulf of California.

The Committee has had considerable involvement in the assessment of the harbour porpoise in the North Atlantic and has worked closely with ASCOBANS in the formulation of conservation programmes. This year the Committee reviewed and endorsed plans for the project *Small Cetaceans of the European Atlantic and North Sea*, or SCANS-II, which has three primary objectives: to update estimates of abundance from the original SCANS survey area and to obtain estimates for previously unsurveyed areas; to develop a management framework for assessing the impact of bycatches and setting safe bycatch limits; and to develop methods for monitoring small cetacean populations during periods between major decadal surveys.

The Committee also reiterated previous advice concerning the need to minimise or eliminate anthropogenic direct removals or threats to habitat of the Irrawaddy dolphin and the Ganges river dolphin.

In the light of new evidence, the Committee repeated its concern over the catches and quotas for some stocks of white whales and narwhals, particularly in Greenland, east Hudson Bay and the Russian Arctic. The Committee repeated previous requests for all Governments to submit relevant information on direct and incidental catches of small cetaceans in their national progress reports and for improved information on stock identity and abundance.

SCIENTIFIC ASPECTS OF WHALEWATCHING

In 2000, the Committee had identified a number of areas for further research on possible long-term effects of whalewatching on whales and a number of possible data types that could be collected from whalewatching operations to assist in assessing their impact. The Committee developed this further at the 2004 meeting. The primary topic considered was a review of the results from the Workshop on the Science for Sustainable Whalewatching held in Cape Town, 6-9 March 2004. The Committee endorsed a number of recommendations from the Workshop concerning: (1) the value of experimental studies to measure the impacts of whalewatching; (2) new approaches and quantitative studies of relevance to the Scientific Committee; (3) further development of a framework for the management of whalewatching similar in concept to those codified in the FAO Code of Conduct for fisheries; (4) use of the precautionary approach in the absence of information of possible damaging effects of whalewatching; (5) use of case studies to promote broad conclusions about assessing impacts of whalewatching on different taxonomic groups at a variety of life history stages; (6) the development of whalewatching guidelines based on criteria that are simple, practical and objectively measurable under field conditions; (7) further development of the IWC's 1997 General Principles for the Development of Regulatory Frameworks for Whalewatching (see www.iwcoffice.org).

The Committee also reviewed whalewatching guidelines and regulations, and new information on dolphin feeding and 'swim-with' programmes.

REVIEW AND COMMENT ON SCIENTIFIC PERMITS ISSUED FOR SCIENTIFIC RESEARCH

All proposed scientific permits have to be submitted for review by the Scientific Committee following guidelines issued by the Commission. However, in accordance with the Convention, the ultimate responsibility for issuing them lies with the member nation.

Most of the discussion at the 2004 meeting centred on reviewing the results of existing permits (Japan – Antarctic minke whales (JARPA); Japan – North Pacific common minke, sei, Bryde's and sperm whales (JARPN); Iceland – North Atlantic common minke, fin and sei whales) and reviewing proposals for their continuation. As in previous years, there was severe disagreement within the Committee regarding advice that should be provided on a number of issues, including: the relevance of the proposed research to management, appropriate sample sizes and applicability of alternate (non-lethal) research methods.

The Committee agreed that it will undertake a full review of the JARPA programme when the complete set of results are available following the completion of the 16-year programme, i.e. some time after the 2005 annual meeting of the Committee.

WHALE SANCTUARIES

The Committee had been asked by the Commission to review the Southern Ocean Sanctuary (SOS) in 2004 and an intersessional working group had been appointed to develop a proposed framework to carry out the review. In summary, the Committee agreed that: (1) whales are not effectively protected from whaling in the SOS, because such Sanctuaries apply only to commercial whaling, and because (apart from stocks that migrate to the IOS) whales also migrate outside of the SOS boundaries; (2) the boundaries of the SOS were appropriately established for some, but not for all stocks; (3) it was not possible to completely evaluate the effectiveness of the SOS because the scientific objectives are not clear and are not associated with quantifiable performance measures. The Committee respectfully requested that the Commission considers clarifying the objective(s) of the SOS in order to allow the Committee to discriminate among designs that would, *inter alia*: protect whales; protect whale species diversity; and increase whaling yields outside the Sanctuary. The Committee also developed a series of recommendations that, once the overall objectives of the SOS have been refined, will allow these objectives to be evaluated, and will facilitate evaluation in future reviews. These recommendations were originally agreed by the participants of the Intersessional

Meeting to Review the SOS, 28-29 June 2004, Sorrento (to be published in *J. Cetacean Res. Manage.* 7 (Suppl.)).

G.P. Donovan
Editor

REFERENCES

- Best, P.B., Bannister, J.L., Brownell, R.L., Jr. and Donovan, G.P. (eds.). 2001. *Right whales: worldwide status*. *J. Cetacean Res. Manage. (Special Issue)* 2. G.P. Donovan (series ed.). International Whaling Commission, Cambridge, UK. 309pp.
- Bjørge, A., Brownell, R.L.J., Donovan, G.P. and Perrin, W.F. 1994. Significant direct and incidental catches of small cetaceans. A report by the Scientific Committee of the International Whaling Commission to the United Nations Conference on Environment and Development (UNCED). Appendix 2. List of small cetacean species. *Rep. int. Whal. Commn* (special issue) 15:127.
- Branch, T.A. and Butterworth, D.S. 2001. Southern Hemisphere minke whales: standardised abundance estimates from the 1978/79 to 1997/98 IDCR-SOWER surveys. *J. Cetacean Res. Manage.* 3(2): 143-74.
- Branch, T.A., Matsuoka, K. and Miyashita, T. In Press. Evidence for increases in Antarctic blue whales based on Bayesian modelling. *Mar. Mammal Sci.*
- Donovan, G.P. 1989. Preface [to the volume *The Comprehensive Assessment of Whale Stocks*]. *Rep. int. Whal. Commn* (special issue) 11: iii-v. Donovan, G.P. 1991. A review of IWC stock boundaries. *Rep. int. Whal. Commn* (special issue) 13:39-68.
- International Whaling Commission. 1991. Report of the Scientific Committee. *Rep. int. Whal. Commn* 41:51-89.
- International Whaling Commission. 1993. Chairman's Report of the Forty-Fourth Meeting, Appendix 3. Resolution on the Revised Management Scheme. *Rep. int. Whal. Commn* 43:40.
- International Whaling Commission. 1994. Report of the Scientific Committee, Annex D. Report of the sub-committee on management procedures. *Rep. int. Whal. Commn* 44:74-92.
- International Whaling Commission. 1998. Report of the Intersessional Working Group to Review Data and Results from Special Permit Research on Minke Whales in the Antarctic, Tokyo, 12-16 May 1997. *Rep. int. Whal. Commn* 48:377-412.
- International Whaling Commission. 1999a. Report of the Scientific Committee. *J. Cetacean Res. Manage. (Suppl.)* 1:1-52.
- International Whaling Commission. 1999b. Report of the Scientific Committee, Annex N. The Revised Management Procedure (RMP) for Baleen Whales. *J. Cetacean Res. Manage. (Suppl.)* 1:251-8.
- International Whaling Commission. 2000. Report of the SOWER 2000 Workshop. *J. Cetacean Res. Manage. (Suppl.)* 2:319-46.
- Perrin, W.F., Donovan, G.P. and Barlow, J. (eds.). 1994. *Report of the International Whaling Commission (Special Issue 15)*. Gillnets and Cetaceans. International Whaling Commission, Cambridge, UK. 629pp.
- Reijnders, P.J.H., Aguilar, A. and Donovan, G.P. (eds.). 1999. *Chemical Pollutants and Cetaceans*. *J. Cetacean Res. Manage. (Special Issue)* 1. G.P. Donovan (series ed.). International Whaling Commission, Cambridge, UK. v-viii + 273pp.
- Roman, J. and Palumbi, S.R. 2003. Whales before whaling in the north Atlantic. *Science* 301:508-10.
- Weller, D.W., Burdin, A.M., Würsig, B., Taylor, B.L. and Brownell, R.L. 2002. The western North Pacific gray whale: a review of past exploitation, current status and potential threats. *J. Cetacean Res. Manage.* 4(1):7-12.