

## Executive Summary of the Workshop on the Mortality of Cetaceans in Passive Fishing Nets and Traps

At its 1988 Annual Meeting the IWC Scientific Committee adopted terms of reference for a Workshop on the Mortality of Cetaceans in Passive Fishing Nets and Traps (IWC, 1989, *Rep. int. Whal. Commn* 39:62-153). It was stressed that the meeting's scope should be limited to scientific and other technical matters related to cetacean entanglement in gillnets and other static fishing gear. The main tasks identified were to:

- (1) identify and describe new and expanding net and trap fisheries that take cetaceans;
- (2) investigate how and why entanglement occurs;
- (3) estimate mortality and assess its impact on cetacean populations, to the extent possible;
- (4) consider possible ways of reducing levels of net-caused mortality of cetaceans.

It was agreed that the Workshop report should include:

- (1) a list and summary descriptions of gillnet and trap fisheries that take or potentially could take cetaceans, with lists of the species involved;
- (2) a species-by-species summary, listing cetacean takes by population and fishery and assessing the impacts of the takes;
- (3) an analysis of the causes of entanglement and assessment of technology and alternatives for reducing the incidental takes; and
- (4) recommendations for
  - (a) documentation of takes,
  - (b) research to develop methods for reducing takes and
  - (c) management actions.

These terms of reference were accepted by the Commission (IWC, 1989, *Rep. int. Whal. Commn* 39:24). At the 1990 Commission Meeting it was agreed that the report from the Workshop should be forwarded to the Secretary-General of the United Nations as soon as available (IWC, 1991, Chairman's Report of the 42nd Meeting, Appendix 6, *Rep. int. Whal Commn* 41, in press).

The meeting took place in La Jolla, California from 20-25 October, hosted by the Southwest Fisheries Center. It comprised two sections, a two-day Symposium attended by about 200 people at which 32 papers were presented, and a four-day workshop attended by 67 scientists.

The Workshop comprised three working groups:

- (1) global review of fisheries;
- (2) impacts on species and populations of cetaceans;
- (3) causes and solutions.

In the time available, these working groups were

unable to complete their full reports. They concentrated on reaching agreed Conclusions and Recommendations. These were subsequently modified and agreed by the full Workshop on the afternoon of the final day. Full reports should be completed within the next month. This report therefore provides only a summary of the main conclusions and recommendations.

### 1. Global Review of Fisheries

#### *General recommendations*

(1) Throughout all regions there is a general lack of adequate statistics on gillnet and trap usage and on marine mammal entrapment.

It is **strongly recommended** that:

(a) fishery agencies and regional bodies (including those of the FAO) ensure that statistically valid data on gillnet and trap effort and cetacean catches are collected and promptly analysed and reported;

(b) adequate statistics on marine mammal entanglement are obtained through independent observer programmes, following scientifically established designs.

(2) Fleets from Taiwan, China, and some other distant-water drift net fleets continue to operate without documentation in the Atlantic and with inadequate data for operations in the Indian and Pacific Oceans. This is a matter of grave concern, not only for nations adjacent to the fishing areas but also with respect to the status of marine mammals taken in these fisheries.

It is **recommended** that, while such activities continue, data on all distant-water fleets must be collected by the flag nations, nations servicing these fleets and independent observers placed on board vessels. The bycatches must be reported and evaluated and appropriate management actions taken before further fishing is authorised.

(3) The Workshop **recommends** that the development of any new fisheries, or expansion of existing fisheries, should only be countenanced after a rigorous multidisciplinary environmental impact assessment that includes the potential effects on target and non-target species, including cetaceans. To this end, aid and development agencies, including UN, national and non-governmental organisations, should be advised of the potentially detrimental effects of these fisheries.

(4) It is **recommended** that national and international organisations address the education of fishermen, officials and scientists as well as the general public concerning the problem of cetacean interactions with gillnet and traps. Specific recommendations for the nations most critically involved are listed in the regional reviews.

(5) Japan and the USA are conducting research to assess the possible impact of lost and discarded fishing gear ('ghost nets'). The Workshop **recommends** that similar research programmes are initiated elsewhere. Specific goals of such programmes should be to reduce the number of nets and pieces of net webbing lost and discarded and to alter net manufacture and design to minimise danger from them.

(6) As has happened in Peru and Sri Lanka, a dolphin bycatch can become a directed fishery under certain economic conditions, leading to heavy exploitation of cetacean stocks of unknown size and status. This could happen in regions such as India and the Philippines where the bycatches are already fully utilized. This is a particular danger to cetacean conservation.

It is **recommended** that national and international fishery and environmental agencies monitor such situations closely. Such directed fisheries should not be allowed to develop until the status of affected stocks has been evaluated.

(7) Many developing countries are unable to fund the stock assessment and fishery monitoring programmes that must be carried out to ensure that incidental catches of cetaceans in particular fisheries are sustainable.

It is **recommended** that:

(a) such nations consider the incorporation of such costs in license fees for fishing in their exclusive economic zones (EEZs);

(b) intergovernmental and private international funding organisations and agencies give high priority to financing such activities.

(8) Given the broad scope of the fishery/cetacean (and other bycatch species) interactions, regional cooperation in examining and addressing the various issues is extremely important.

The Workshop **recommends** that such cooperation should be encouraged among, for example, the Baltic and northeastern European states through the agencies of the European Community and International Council for the Exploration of the Sea (ICES), among Caribbean states, between Argentina and Chile (because of the crab-bait situation—see regional account for Southeastern Pacific), among West African states, among Indian Ocean states, among the North Pacific Rim nations, and among the Pacific Island nations.

#### *High priority regional recommendations*

Series of recommendations for regional action will be

given Report of the Working Group on the Global Review of Fisheries. Some of these recommendations are considered to be of especial urgency and are repeated here for emphasis.

(1) It is **recommended** that solving problems associated with the incidental capture of the vaquita in totoaba gillnets in Mexico and the baiji on longline hooks in China is accorded the highest priority. In the case of the vaquita the fishery is illegal, except for some fishing under experimental permits. The fishery affecting the baiji is totally illegal. However, both fisheries continue to operate at high levels because of inadequate enforcement and continue to threaten the species with extinction.

(2) The Workshop commends Italy for its decision to ban swordfish and albacore driftnets in Italian waters and their use by Italian vessels in other parts of the Mediterranean.

It is **recommended** that similar actions be taken elsewhere in the Mediterranean. International cooperation and action by the General Council for Mediterranean Fisheries (CGPM) is required to ensure that large-scale drift net fisheries do not restart from other nations and that reflagging of vessels for the purpose of continuing the fishery does not occur.

(3) Gillnet fisheries continue to expand in Pakistan, India, Sri Lanka and Bangladesh. As noted in General Recommendation 4 above, it is **recommended** that new fisheries should not be initiated or existing fisheries expanded until after evaluation of their effects on non-target species.

(4) Throughout the Indo-Pacific region, and particularly in Southeast Asia, drift and set gillnets are widely used, but there is extremely limited information on incidental catches in such gear in these fisheries. It is **recommended** that this area be given high priority for future research into the impacts of gillnets and other fishing gear on marine mammals.

(5) Large numbers of coastal trap and gillnet fisheries exist in Chinese coastal waters; one estimate is that 3,500,000 gillnets are in use. It is **recommended** that incidental mortality of cetaceans in these fisheries be addressed as a matter of urgency.

## 2. Impacts on Species and Populations of Cetaceans

### *Conclusions*

(1) Cetacean populations in general seem unable to sustain rates of kill of more than a small percentage of the population per year. Even kill rates as low as 2% per year may not be sustainable depending on the life history of the species and the age and sex composition of the kill.

(2) Agencies that are responsible for the management of marine resources should manage from a conservative point of view, i.e. fisheries should not be allowed to operate at a particular level until there is evidence

that the kill of cetaceans associated with that level of fishing effort is sustainable.

(3) Information on kill rates and total fishing effort in passive net and trap fisheries and on the size of cetacean populations can be difficult to accumulate. Kill rates and fishing effort can be expected to vary among years, areas and seasons. Estimates of population size will necessarily be imprecise, especially where data on stock structure are lacking. Despite problems with the collection and analysis of data on kill rates, total fishing effort and population size, it is important that the agency responsible for managing a particular fishery collect these data on a systematic basis. In the absence of such information, the environmental impacts of most gillnet and trap fisheries cannot be assessed.

(4) The impacts of coastal gillnet and trap fisheries on strictly coastal species are especially noted. Such fisheries and cetacean populations are in urgent need of assessment, and in many cases the levels of fishery mortality need to be reduced or eliminated.

(5) The best available information at this time indicates that several stocks of cetaceans are unable to sustain current levels of removal caused by passive net and trap fisheries. These include:

- (a) vaquita in the Gulf of California;
- (b) baiji in the Yangtze River;
- (c) hump-backed dolphins along the eastern coast of South Africa;
- (d) striped dolphins in the Mediterranean Sea;
- (e) harbour porpoises and in the eastern and western North Atlantic;
- (f) bottlenose dolphins along the eastern coast of South Africa.

Furthermore, there are additional stocks where all of the information needed to evaluate the impact of passive net and trap fisheries is not available, but where the potential for current levels of removals not being sustainable is likely. This is particularly true where rates of kill are known to be large. Of particular concern are the following stocks:

- (a) dusky dolphins in the eastern South Pacific;
- (b) northern right whale dolphins in the central North Pacific;
- (c) sperm whales in the Mediterranean Sea.

#### *Recommendations*

Arising from the discussions in the working group on the impact of fisheries on species and populations of cetaceans, the Workshop agreed to the following recommendations.

- (1) It is **recommended** that the killing of:
  - (a) the vaquita in the Gulf of California;
  - (b) the baiji in the Yangtze River;
  - (c) hump-backed dolphins along the eastern coast of South Africa;
  - (d) striped dolphins in the Mediterranean Sea;

- (e) harbour porpoises along the coast of central California and in the eastern and western North Atlantic;

- (f) bottlenose dolphin along the eastern coast of South Africa;

in passive and trap fisheries must be reduced immediately.

Mechanisms for reducing the take of these species will have to be developed by the agencies with management authority.

(2) Where the directed or incidental kill of any cetacean stock is thought to exceed a small percentage of the population or where a particular stock is declining and known to be taken in passive net and trap fisheries, it is **recommended** that the fishery bycatch should be limited while the following information is collected.

(a) *Kill rates*. These can be collected either by placing observers on fishing vessels, placing observers on research vessels that can observe fishing vessels or making experimental sets of gear similar to that used in the fishery. Estimates of kill rates from mail surveys to fishermen or dockside interviews alone are not adequate. For directed fisheries, kill rates can be estimated by monitoring the number of cetaceans landed.

(b) *Age and sex composition of the kill*. This will require biological specimens to be collected by trained technicians.

(c) *Stock identification*. Specimen material must be collected.

(d) *Total fishing effort for all passive net and trap fisheries*. These data should be collected and analysed prior to the start of the next fishing season.

(e) *Population size*. Initially, estimates of minimum population size on a stock-by-stock basis are adequate for management purposes. However these estimates should be replaced by estimates of absolute abundance with their associated level of precision. Estimates of population trends alone are not adequate.

### 3. Causes and Solutions

#### *Conclusions*

(1) The incidental capture of cetaceans appears to be almost universal in drift and set gillnets, and a common occurrence in some trap fisheries. Wherever cetaceans and gillnets are found in the same area, at least some cetaceans are caught.

(2) However, there is no universal cause or solution to the incidental capture of cetaceans in fishing gear. The precise nature of the interaction varies from area to area, fishing gear type to fishing gear type, species to species, culture to culture, and any combination of these.

(3) Small cetaceans have sensory abilities which can detect the webbing and rigging of gillnets and other

passive fishing gear. Encounters with nets may occur as they forage or engage in other activities which increase the chances that they will fail to detect nets. Less is known of the sensory abilities of large cetaceans.

There are a variety of environmental, social and sensory conditions which may interfere with detection of nets. Additional study on the role such factors play in entrapment of cetaceans is necessary.

(4) Even if the cetaceans detect nets, a variety of behavioural factors contribute to the entrapment or entanglement. These include curiosity, exploration and perception, escape reactions and social organisation.

(5) There is almost no behavioural information on how and when entanglement of cetaceans occurs. There is little quantitative information on how many animals in the vicinity of a net become entangled, or on how many entangled animals escape. There are few quantitative data on many of the factors which cause entanglement or which might provide solutions. Basic information on entanglement must be collected as a matter of urgency. More rigorous scientific procedures must be followed in experiments so that causes and solutions can be properly evaluated.

(6) As noted in (2) above, at this time there is no practical, universal modification of fishing gear which can be suggested to solve all problems of incidental entrapments of cetaceans. In urgent cases, such as that of the vaquita, there may be no alternative but to ban the fishery.

(7) Some fishing gear modification and management regimes do provide potential solutions and can be suggested for specific fisheries where entanglements of cetaceans occur. In all cases careful assessment and monitoring of the effectiveness and impact of modifications introduced to lower incidental catches of cetaceans must be made.

(8) There are a number of promising research areas which may lead to reduction of incidental catches

of cetaceans and which should be further explored; these include time/area restrictions on fisheries, adjustment of gear strategies and selectivity of gear, and the enhanced detection of gear. Management techniques for dealing with the incidental take of cetaceans which are most promising at this time are time/area restrictions and area closures.

(9) In most areas fishermen are unaware of the extent and impact of cetacean entanglement. Fishing communities should be made aware of this and involved in the process of finding solutions. Methods to accomplish this should be carefully researched and evaluated.

#### *Recommendations*

In addition to the specific research recommendations included in the body of the report, the Workshop agreed to the following recommendations.

(1) It is **recommended** that research on causes and solutions of entanglements focus on those fisheries where urgent action is required. This should be achieved by organising local workshops including scientists, engineers, fishermen, managers, and others.

(2) It is **recommended** that particular priorities for research are:

(a) behavioural factors which predispose cetaceans to entanglement including those immediately prior to and during entanglement;

(b) monitoring time and area closures;

(c) gear strength and strategy adjustments and alternative gears;

(d) environmental and ecological factors influencing these behaviour patterns.

(3) It is **recommended** that studies on solutions to cetacean bycatch be conducted in such a manner that bycatch of other species is also considered.

(4) It is **recommended** that significant technological changes within fisheries be preceded by an assessment of their impact.