AMENDMENTS TO APPENDICES I AND II OF THE CONVENTION

A. PROPOSAL

Inclusion in Appendix I of all species and populations of cetaceans other than those already included in Appendix I or which may be transferred immediately by decision of the fourth meeting of the Conference of the Parties, the catches of which are regulated by the International Whaling Commission, and for which the Commission has set zero catch limits for commercial whaling except for the West Greenland population (entry into force 1 January 1986)*.

B. PROPONENT

The Republic of Seychelles.

C. SUPPORTING STATEMENT

1. Taxonomy

11. Class: Mammalia

12. Order: Cetacea

13. Family: -

14. Species: -

15. Common Names: -

All cetacean species are now included in Appendix II and all those whose catching is at present regulated by the IWC are included in Appendix I, with the following exceptions:

Balaenoptera edeni (Bryde's whale; the tropical whale)
Balaenoptera acutorostrata (minke whale; piked whale).

It is understood that one or more other Parties have proposed the immediate inclusion of B. edeni in Appendix I and Seychelles is supporting that.

The status of some bottlenose whales with respect to the IWC's regulatory powers is at present uncertain. This matter is the subject of another listing proposal by Seychelles. Reference is made to the supporting document for that proposal which is to include the four species in the IWC definition of "bottlenose whales" on Appendix I immediately. For the purpose of the present proposal we therefore present justification only with respect to the piked (minke) whale. It is possible, however, that before this proposal, if adopted by the Parties to CITES, comes into effect other species will have become regulated by the IWC and zero catch limits set for one or more stocks of those species. It is envisaged that CITES Parties would take appropriate action with respect to any such species stocks at the proper time, perhaps by postal vote.

---

* This text is an amended version of the original proposal [see document Doc. 4.40.2 (Rev.)]. (Note from the Secretariat).

2. Biological Data

Details regarding the minke whale are given in the Annex. Biological data for bottlenose whales are given in a separate proposal by the Seychelles; of these the data for Hyperoodon ampullatus are relevant to the proposal at this time since it is the only one of four species catching of which is now regulated by the IWC (zero catch limit throughout its range - the North Atlantic). Data for the Bryde's (tropical) whale are contained in a proposal by another Party.

A general observation on habitat trends is necessary with respect to all these species. The diets of all of them include species of fishes and/or molluscs and crustaceans which are targets of intensive commercial fisheries. There is no evidence that their feeding is in any way deleterious to fisheries, nor that it would possibly become so as a result of their being protected and perhaps increasing slowly in numbers as a result. In some cases, however, the fish and shellfish species of commercial interest form substantial parts of the diets of these whales, in certain areas or at certain seasons. Reduction of the fish/shellfish stocks by fishing therefore probably reduces the carrying capacity of the marine environment for whales, and it can do so rapidly under modern fishing conditions. It is most unlikely that such an effect would itself threaten the survival of any species or population, but it would enhance the threat from continued whaling. In the North Atlantic these dietary items of the bottlenose whale and the minke whale have been very greatly depleted in recent decades. This is probably true also in the North Pacific. In the southern hemisphere there is as yet no evidence of severe fisheries depletions in temperate and polar latitudes. The expansion of the Antarctic krill fishery is, however, occurring rapidly and is likely to be intensive in certain parts of the region. In the longer run this is likely to impede to an unknown degree the recovery of baleen whales, from past whaling, in those areas. Bryde's whales in the tropics and sub-tropics are possibly already affected, particularly off the coast of Peru.

A general point is that the level of scientific research has been so universally low relative to what is needed to provide clear evidence of the status of whale populations, and the scientific methodology for assessing them has been shown recently to be so inadequate, that is not surprising that even for the better known species evidence of depletion and endangerment is inconclusive. The IWC itself has recognised now this situation, and such recognition played an important part in its arrival at the decision this year that commercial whaling should soon cease, until such time as depleted stocks have recovered and there is a good scientific basis for sustained whaling. A very important fact that should be taken into consideration by Parties to CITES is that it has been revealed that a real rate of decline of whale populations resulting in gross depletion in, say, ten years, could not be detected and demonstrated to be statistically significant in that period by present methods. Since the maximum theoretically possible rate of recovery of whale populations is very much slower than the usual rates of depletion, even under regulation, there is an exceptionnally good case for caution in exploitation of them, especially for the purpose of providing commodities for an international market with a very large

unfilled demand. All the species have a high individual value, and occur in international waters as well as in the areas of national jurisdiction of very many coastal states.

They are all thus vulnerable to the development of so-called "pirate" whaling by vessels flying flags of convenience and not subject to regulation of any kind. This threat is made more real by the ease with which surplus fishing vessels can be converted to small factory/catchers, operating pelagically, and the availability of existing catcher boats no longer required for more legitimate whaling operations.

3. Trade Data

Bottlenose whales yield oil which is similar to sperm whale oil, a dried meat which is considered suitable for human consumption only in one province of Japan, and processed meat for feeding pet animals and husbanded fur-bearers. All these products have entered international trade and/or been introduced from the seas beyond national jurisdictions but none are now so traded as far as is known. Bryde's and minke whales yield primarily meat for human consumption and nearly all current production is traded internationally, by all producers and consumers. These species also produce relatively small quantities of baleen oil, which is also primarily for human consumption in processed form, and is traded internationally. The quantities are less than the oil production from the more traditional whaling for the larger species of baleen whales, for four reasons:

- they are smaller than the other species individually and although substantial numbers are being caught currently these numbers are far less than in the heyday of whaling;

- with the main valuable product from baleen whales now being meat there is less rendering down and hence an oil production per whale less than it might otherwise be;

- these species contain a lower proportion of body fat than the larger species, by weight. This is particularly so for the tropical Bryde's whale which, because of its warm habitat and limited migrations, has less need for body insulation;

- the whaling methods in some areas, especially using small pelagic vessels for minke whales, are such that the prime meat is removed at sea and the rest of the carcase abandoned wastefully; onboard rendering facilities may be limited or absent. [In fact there is some doubt as to whether this is always in accordance with Article 19(b) of the IWC Convention which provides for the full processing of caught whales save specific exceptions].

Minke whales are caught to provide frozen meat for human consumption. They yield some baleen oil, which also enters international trade, as well as the usual whale by-products for various minor uses other than for human consumption as food. Minke whales are taken in the Antarctic by Japan and the U.S.S.R. in waters which are not under any generally recognised national jurisdiction. The meat from them is all consumed in Japan. It is not

clear whether all the oil is also so consumed or whether some of it at least is consumed in U.S.S.R. or even exported to other countries that are not bound by restrictions on such trade.

Other countries catching minke whales are Norway, Iceland, Brazil, Denmark (Greenland), the Republic of Korea. Most of the meat they produce enters international trade, but it is not possible to say exactly what proportion. Trade statistics do not distinguish between meats from different baleen whale species, nor do they identify the origin of the minke whales as to location of catch except when this can be deduced from the fact that certain countries cannot legally catch other species or cannot operationally reach more than one minke whale stock.

The Brazilian catch is taken entirely within waters under Brazilian jurisdiction; there is some local consumption, but most of the production, including virtually all the prime meat, is exported to Japan. The catch of the Republic of Korea, taken from the Sea of Japan - Yellow Sea - East China Sea stock, is, it is thought, taken mainly if not entirely in waters under jurisdiction of the Republic of Korea. The meat - some or perhaps all of it - is exported to Japan. The Icelandic catch is taken entirely from the Central North Atlantic stock and in waters under Iceland's jurisdiction. Some of the meat produced is exported to Japan and the rest is consumed locally.

The Norwegian catches are taken partly from the North Eastern Atlantic stock and partly from the Central North Atlantic stock. The meat from these two localities is not distinguished in production or trade statistics. A substantial proportion of the total Norwegian minke whale catch is taken in Norwegian waters, some in Icelandic waters and some from the high seas (and possibly from Danish-Greenland waters). Some of the meat is consumed in Norway, but much (possibly one half) is exported to Japan. Thus Norwegian caught minke whale meat enters international trade both by being exported and by being derived from whales taken outside national jurisdiction.

The Danish catch is taken from the West Greenland stock, by vessels operating from the Greenland coast. Some of the meat is consumed locally and some is exported to mainland Denmark. It is not recorded whether any of this production also reaches other international markets - Norway or Japan.

The total value of trade in meat from minke whales is not recorded. It now constitutes more than one half of the legal trade in baleen whale meat as well as much of the baleen oil production.

It is thought that in recent years minke whales were included in the catches taken by vessels flying the flags of non-member states of the IWC, and thus outside its regulatory powers and catch limits - notably by Taiwan and by "pirate" vessels operating in the Atlantic under various flags. Such production of meat from these as was not embargoed was exported to Japan. As a result of vigorous corrective action by IWC member nations this trade has temporarily ceased, but a renewal of it is a continuing threat, especially because ownership and destination - which presents serious problems of tracing illegitimate trade - and because the dwindling availability of legally caught whale meat has ensured that there remain large potential financial rewards from such activity.

Minke whales are taken from the Sea of Japan - Yellow Sea - East China Sea and the Okhotsk Sea - West Pacific stocks by coastal operations from Japan. These catches are thought to be taken entirely in waters under Japanese jurisdiction and the products to be consumed entirely within Japan. There is therefore no international trade involved in these operations, and they would not be directly affected by the proposed decision to list the species on Appendix I of CITES.

4. Protection Status

The IWC has established for minke whales catch limits of zero in 1983 for the Remainder of the North Pacific, for the Northern Indian Ocean and for the Atlantic Canadian East Coast stocks. For all other stocks catch limits have been established for 1982/83 or 1983, as appropriate; none of these are based on scientific assessments of the stocks in question, but simply on continuation of the approximate levels of past catches.

Minke whales, as other whale species, are protected in the Indian Ocean whale sanctuary established by the IWC in 1979. This extends southward to 55°S latitude. Minke whales may also not be taken by pelagic operations anywhere between the 40°N and 40°S parallels.

Many countries have adopted laws prohibiting the taking of minke whales (as of other species of cetaceans) in waters under their national jurisdiction, either by their own nations or by others. In addition a number of countries have prohibited the entry into their territories or the export from them, of products from whales, including minke whales.

At its 1982 meeting the IWC adopted, by the necessary three-quaters majority of voting members, a decision to set all catch limits for minke whales to zero as from the 1985/86 Antarctic season and the 1986 coastal whaling season. This decision was based on many considerations; one of them was the realisation that despite intensive research efforts over several years there has been a complete failure to provide a reasonably sound scientific basis for establishing catch limits which would not lead to reductions in stocks to less than optimal levels. Thus it is understood that commercial whaling would not resume until such time as such a scientific basis is available and as any stocks which are subsequently found to have been depleted have substantially recovered. In addition, in the specific case of the minke whale the Commission has decided that an alternative must be found to the present method of capture which is by use of a non-explosive harpoon which is considered to be inhumane.

5. Information on Similar Species

Minke whales are easily distinguished alive from other baleen whales. The meat is not so easy to distinguish though it can certainly be done by experts in this field. Meat from different stocks of the species cannot be distinguished. The oil cannot be distinguished from the oil of other baleen whales.

Bryde's whales are difficult to distinguish alive from sei whales (which are on CITES Appendix I); catch statistics are unreliable and much confusion continues to the present time. It is said that the

meat can be distinguished by experts from that of other species of baleen whale, but this, if possible, is only possible by highly technical means details of which have not been published. The oil is not, as far as is known, distinguishable from that of other baleen whale species.

Most stocks of Bryde's whales, some stocks of minke whale and one of the four species of bottlenose whales are protected by zero catch limits set by the IWC. The available scientific information about all of these, and also about all the stocks exploitation of which is at the moment permitted, is very much more sparse, weaker and generally inconclusive than is the relevant information about any of the species of whales that are currently listed on Appendix I of CITES. In this respect, and while market pressures and present management procedures prevail, they may be regarded as more threatened by unnoticed depletion than are the other species. It is the recognition that continued intensive commercial whaling in a situation of such ignorance will inevitably lead to threats to the productivity and well-being of populations that triggered the IWC decision the present proposal is intended to reinforce.

6. Comments from Countries of Origin

The minke whale occurs in the waters under the jurisdiction of most coastal countries. It is caught in the waters of only a few of them, as detailed above. It has not been possible in the time available to seek the views of all the countries concerned with respect to this specific proposal. However, an indication of the range of views is given by the following facts.

A large majority of member states of the IWC have decided that commercial whaling should cease in the near future, and therefore that trade in whale products should cease. However, none of the countries that at present catch minke whales supported the decision. Whether any of them will record objections to the decision in the statutory time period (ninety days after official communication of the decision) is not yet known.

A majority of the member states of the U.N. system have, through the 1972 Stockholm Conference and the Governing Council of UNEP continually re-affirmed their wish that commercial whaling shall for the time being cease.

The World Conservation Strategy, which is adhered to by many states as well as supported by most organisations concerned with the environment, call explicitly for a pause in commercial whaling until such time as it may be safely resumed on a scientific basis.

All policies for cessation, pause or moratorium assume that it will be several years, and possibly several decades, before the criteria for safe resumption of whaling are met. This implies that from some short time after the cessation a prohibition of trade in baleen whale products is desirable to reinforce the conservation decision, and particularly to impede illegitimate catching and trade.

A particular difficulty with regard to securing meaningful comments from countries of origin of whale products is that there is clearly a wide range of opinion within most if not all of them. Thus in all countries still engaged in commercial whaling there are significant

groups of persons and non-governmental organisations firmly opposed to continued whaling in the present circumstances. Furthermore, in several of them it is known that different departments of government have widely divergent views on this matter.

Then also it is a policy question that has taken the serious attention of political parties and within many countries parties that are in government at the present time and those that are out of it can have diametrically opposed views. In recent years there have been changes of government in a number of countries that have resulted in change of policy with respect of whaling. Even where there has been no such change reversals of attitude have occurred. A very important factor is the time lag between the latest considerations by the scientists - especially by the Scientific Committee of the IWC and the consequent review of policy by governments. The changes of view, on the basis of new data and analyses, by the Committee at its 1982 meeting were particularly dramatic, and it is not clear that the implications of these have yet effectively filtered to and been digested by governments. This was especially true with respect to the minke whale, for which hitherto unnoticed weaknesses in assessment for the North Atlantic and the Southern Hemisphere were revealed. Still less have the implications yet been fully digested by governments that are Party to CITES but not members of the IWC. Therefore the occasion of the Gaborone meeting itself may be a more appropriate time to evaluate the views of countries concerned, whether they be producers, traders or range states.

7. Additional Remarks

There is no positive evidence that any putative population of minke whales is endangered in terms of the literal interpretation of the Berne Criteria for CITES. On the other hand, given the total absence of scientific assessments for any minke whale stock we cannot reasonably assume that they are less endangered than are some of the stocks of other baleen whale species that now enjoy full protection by IWC and by inclusion on CITES Appendix I. The minke whale has been under intensive exploitation for only a short time in comparison with other baleen whale species, but in that time it has been subject to extremely intense exploitation in all oceans, in many cases by vessels which were constructed for the purpose of exploiting the other whales. In addition there has come into existence a new class of pelagic catcher/factory boat specifically designed and equipped to catch and process minke whales. The statistical data from these latter operations are very poor compared with the data available from some of the older types of operations, yet these small vessels are extremely mobile and thus able to move to different locations as soon as whales in one locality are depleted, posing an obvious threat to the stocks. These "small type whaling" operations are also in many cases wasteful in that the prime meat is taken from the whales at sea and the rest of the carcase is let go rather than being fully processed. This procedure is considered by some to be a generally contrary to the International Convention for the Regulation of Whaling, which calls for full utilization of whales taken, even of those taken under permit for scientific purposes.

So, the minke whale is certainly no less endangered than are some other species already listed on Appendix I of CITES. It is possible that the present regime of catch limits is leading to a continuing decline of some or all populations, and some scientists consider that this is highly probable. The continuation of the current level of catch for a further three years, as intended by the IWC unless strong evidence appears to justify significant reductions, will possibly mean that several minke whale stocks will be depleted by the time the zero catch limits are set in 1985/6 and 1986.

The IWC has taken a very reasonable approach to the cessation of commercial whaling in permitting a period of three years for the "rationalisation" and phasing out of the industries concerned. It would be equally appropriate and reasonable for the Parties to CITES to take a similar action ahead of time so that traders may not be faced with a sudden cut-off in their business. It is for that reason that Seychelles proposes that action be taken at the Gaborone meeting of Parties, rather than awaiting the following meeting in, presumably, 1985.

Finally, and perhaps most importantly, it is considered that the present proposal is in full conformity with the Resolution of the San José meeting of Parties, 1979, concerning Trade in Certain Species and Stocks of Whales Protected by the International Whaling Commission from Commercial Whaling. Under that Resolution it was recommended that Parties agree not to issue any trade permits (including certificates of introduction from the sea), under CITES for any specimen of a species or stock protected from commercial whaling by the IWC. It should be noted that this Resolution does not specify any conditions regarding such protection, and specifically has no reference to any particular reasons or criteria for protection established by the IWC. The decisions by Parties at the New Delhi meeting to place the sperm, fin and sei whales on Appendix I was in accord with the San José Resolution, and it also demonstrated considerable foresight by Parties in that only subsequently to their decision did the IWC itself decide to extend protection to some of the species stocks in question. Action as here proposed would again demonstrate the concern of Parties to use the CITES Convention as an effective instrument to ensure that certain populations of animals, which are highly valued in trade, and are for that reason and for biological reasons particularly vulnerable, shall not be further depleted until such time as there is reasonably good scientific evidence on which to base a rational exploitation regime. Such action is particularly appropriate with regard to species that are world wide in their distribution, that live mainly outside national jurisdiction, about which there is at present a high degree of ignorance as to their basic biological characteristics, and for the protection of which there exists a considerable and growing consensus among nations.

8. References

Reports of the IWC and its Scientific Committee, especially of the 1982 meeting.

"A World Review of the Cetacea" Nature Conservancy Council Great Britain, 1980.

"Sea Guide to Whales of the World". Lyall Watson, Hutchinson, London 1981.

"Porpoise, Dolphin and Small Whale Fisheries of the World". Edward Mitchell, I.U.C.N., 1975.

"Review of Biology and Fisheries for Smaller Cetaceans". Ed. Edward Mitchell, Special Issue of the Journal of the Fisheries Research Board of Canada, 1975.

"Mammals in the Seas". F.A.O. of U.N., Rome, Italy, 1978 (Vol. 1) and 1981 (Vol. 2).

The above references themselves contain extensive bibliographies the relevant entries in which have also been consulted in the preparation of this document.

"Field Guide of Whales and Dolphins". W.F.J. Morzer Bruyns, Amsterdam, 1971.

Biological data for the minke whale

21. Distribution: Minke whales are found in all oceans and adjacent seas.

The IWC Scientific Committee at present recognises 14 management stocks of the minke whale. The species is readily identifiable in life, being very much smaller than all other species of Balaenoptera. There has been a number of proposals for designation of subspecies but none of them have been universally accepted. Separation of a North Pacific form from a Southern Hemisphere/Antarctic form at subspecies level may be justified both on grounds of coloration, morphology, anatomy and biochemical results.

It is generally presumed that the Atlantic and the Pacific populations living north and south of the equator are biologically separate. There is no firm evidence that the minke whales found north of the equator in the Indian Ocean are biologically separate from those living south of it in that ocean, although one of the suggested subspecies was described from Sri Lanka and this is perhaps of a northern Indian Ocean form. For management purposes the IWC classifies the Northern Indian Ocean minke whales separately from the southern hemisphere stocks.

In the North Pacific as a whole the IWC recognises three stocks:

a. Sea of Japan, Yellow Sea, East China Sea;

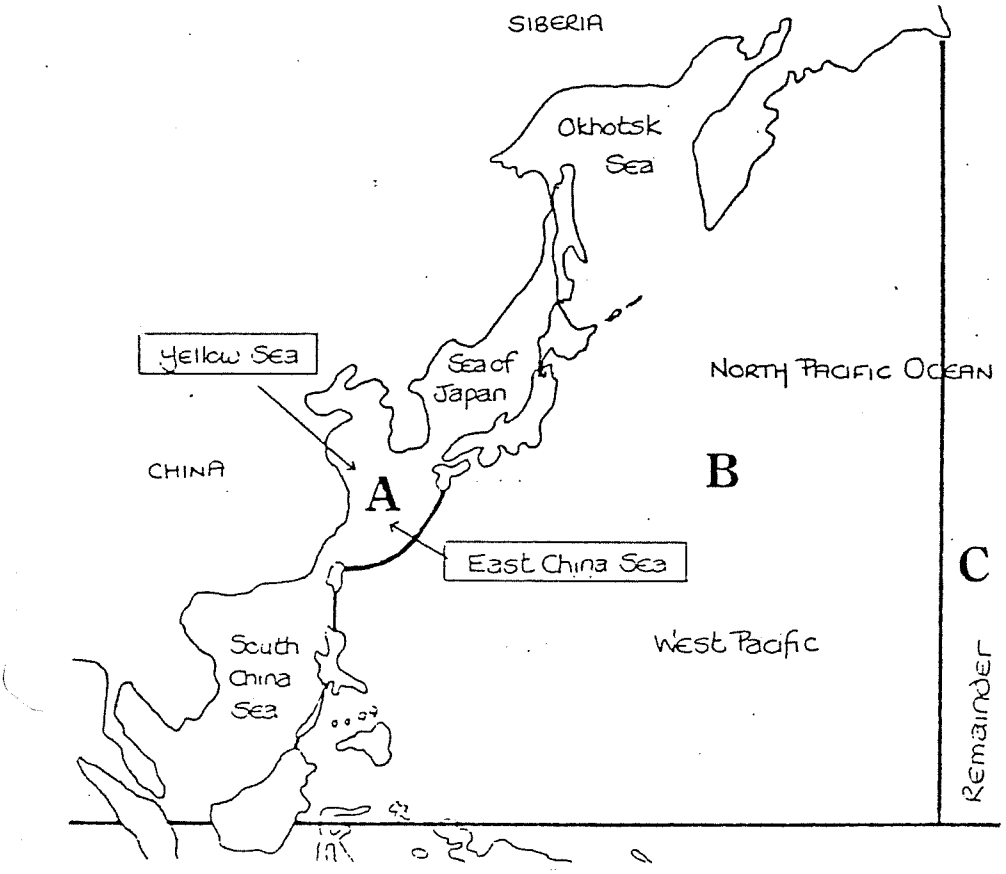
b. Okhotsk Sea, West Pacific;

c. "The Remainder" i.e. the Central and East Pacific.

At its 1982 meeting the IWC Scientific Committee set a boundary between stocks "b" and "c" at approximately 178°E longitude, but this boundary is arbitrary. The IWC map showing the boundaries of the western stocks is reproduced below. Although the IWC makes no specific reference to the South China Sea it is known that the minke whale occurs there, and the diagram suggests that the Scientific Committee regards them as forming part of stock "a". However, while whalers say that minke whales do not pass through the strait between Sakhalin and Hokkaido (La Perouse or Soya Strait), so the separation of the stocks "a" and "b" at high latitudes may be biologically justified, the same cannot be said for the separation between the whales in the South China Sea from those in the tropical and subtropical western Pacific.

The separation at northerly latitudes is said also to be justified by the "locations of past and present whaling grounds, size differences of animals taken, and temporal and spatial differences in inferred migration patterns" (Report of 1982 meeting of IWC Scientific Committee, in press.)

There is little scientific evidence that these distinctions and boundaries reflect in any way biological separations. Marking experiments have not so-far reavealed mixing between stocks "a" and "b". Biochemical studies have not revealed any differences than can be interpreted as indicating biological separation, and particularly not where such separation has been sought - between West Greenland and East Greenland (Central stock).



In the North Atlantic the IWC recognises four stocks:

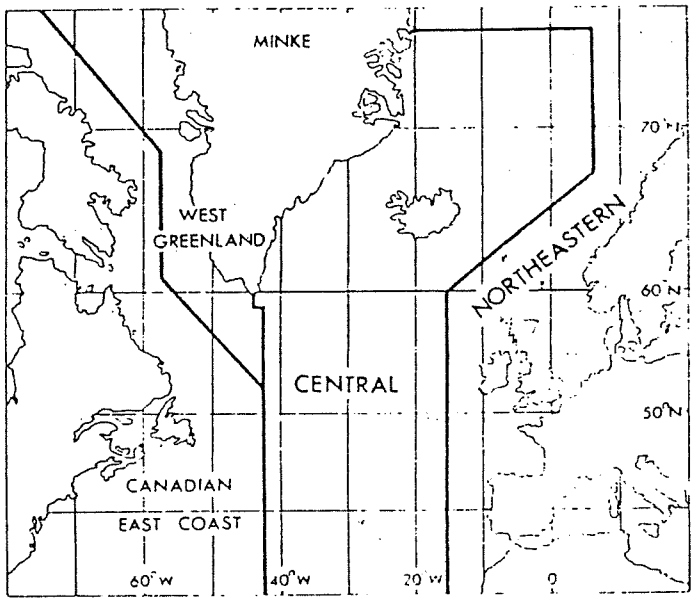
a. Northeastern;

b. Central;

c. West Greenland;

d. Canadian East Coast.

The boundaries of these are shown in the diagram below.



Watson has, in his most recent review of the available data, concluded that "There is immense variability in this species and it is likely that only the Antarctic form will be confirmed as a distinct and consistent variety". The IWC has in recent years adopted a system of defining six management stocks for the Southern Hemisphere, with boundaries along meridians corresponding with those used for other baleen whale species. There is no biological evidence that there are six separate populations or that if there are these meridians define well their boundaries. Information from recent marking experiments reveals that recaptures tend to be located westward of the position of marking, requiring that at least three of the present boundaries need to be re-defined.

Population studies indicate that there are probably less than six independent populations, and even the possibility that there is only one cannot be ruled out. In contrast with earlier data about the tropical and subtropical breeding areas of other baleen whales very little is known about the distribution of minke whales in lower latitudes. It has been assumed that there is an annual migration cycle as in the other Balaenoptera spp. (except B. edeni) but some aspects of the population data suggest that not all individuals migrate regularly between the Antarctic ice margin (very close to which all the "Antarctic" catching takes place) and more northerly waters; in fact a two year cycle is possible. Because of all these uncertainties, and the evident lack of biological information about this species, compared with that for Megaptera (humpback) and other balaenopterids, the population estimates given here will be for the Southern Hemisphere as a whole. There has been a suggestion that the minke whales currently being caught off the coast of Brazil are from a separate tropical stock but there is no convincing biological evidence for this hypothesis; they are generally assumed to be part of the stock or stocks of the South Atlantic generally.

22. Population: There is very great uncertainty about all population/ stock estimates of minke whales and about the trends in these. For many management stocks there are no estimates at all, although all except two of them (Atlantic - Canadian East Coast and North Pacific - "Remainder") are currently exploited commercially. The minke whale has been the subject of much attention in recent years by the IWC scientists because it is the basis for the main whaling industries since the protection of most other whale species. Special studies have been conducted at considerable expense especially sine 1976, but the results have been ambiguous and inconclusive; in fact the most recent studies have thrown doubt on what were until 1981 regarded as "facts" or at least well-founded theories. A summary of the situation with respect to population assessments is given below.

North Pacific

a. Sea of Japan - Yellow Sea - East China Sea

There are no population estimates for this stock. Catches per unit effort by the Republic of Korea show no trend over the past ten years; they have not, however, yet been satisfactorily corrected for changes in efficiency of operations so that a declining population trend cannot be excluded. There is no information about the present population level relative to that when commercial whaling began.

b. Okhotsk Sea - West Pacific

There are no population estimates. In 1979 the IWC Scientific Committee concluded that "there are no biological data available with which to assess this fishery (for minke whales by Japan)". No such data have since become available. The population has been exploited intensively at least since 1952; Japanese catches per unit effort do not indicate any trend in abundance over the past five years although a decline concealed by as yet uncorrected changes in efficiency cannot be excluded as a possibility. Even if it has not recently been declining the present population must be substantially less than it was in the early 1950's when annual catches were higher than they are now.

c. Remainder of the North Pacific.

There is no information about the size of this stock or any trends in it.

North Atlantic

a. Northeastern

A recent estimate of the available stock has been given, based on mark-recapture experiments, of 65,000, with confidence limits of 43,000 - 100,000. Many members of the IWC Scientific Committee however, at the 1982 meeting, expressed serious reservations about the validity of these, considering them to be biased upward, and possibly very much so. Recalculations gave central estimates ranging from 31,000 up to 91,000, under different assumptions. (These figures are all for the "recruited" stock; total stock figures are higher). No significant trends in abundance over the last ten years have been discerned in catches per unit effort, but for the usual reasons to do with efficiency the Scientific Committee agreed that "it would be problematical to use this data series for judging the stability of the stock". Thus it is not known whether or not the stock has been declining in recent years, nor what is the present stock size relative to the number before commercial whaling became intensive.

b. Central

The situation regarding assessments is similar to that for the Northeastern Atlantic, except that there are no population estimates from marking and also the several available series of catch per unit effort data show conflicting trends.

c. West Greenland

There are no stock estimates. In 1980 the IWC Scientific Committee reported that there were "not yet definitive biological data available with which to assess this stock ..." Since then some such data have been provided but in 1982 the Committee found they contained inconsistencies. It has also not been able to reconcile different trends in available sets of data for catches per unit effort. Although some members expressed "concern about recent possible declines in abundance", it is clear that there is no reliable information about population size, trends in that number, or the present population relative to that before the modern period of intensive whaling.

d. Canadian East Coast

Whaling ceased after 1972 and no information about it has become available since. There are no estimates of population size. It is not known how far it had declined from its initial abundance under the impact of earlier whaling, nor by how much, if at all it has recovered since whaling ceased.

Northern Indian Ocean

There is no information beyond the fact that minke whales are occasionally seen in this area.

Southern Hemisphere

Commercial whaling began in the Antarctic in 1971/2. The IWC Scientific Committee has made attempts to estimate the population(s) every year since 1974. In the mid-1970's a hypothesis emerged that prior to 1971 the minke whales had been increasing naturally for several decades, since their competitors the blue and fin whales especially had declined. This arose from the noting of certain anomalies in age compositions of the early catches and assumptions as to the value of the natural mortality rate in this species. The hypothesis was made more plausible by calculations as to the "surplus" of krill made available by the reduction in biomass of baleen whales and by observations that certain other consumers of krill in the Antarctic, notably seals, had increased in numbers.

Very intensive examination of the hypothesis during 1981-82 and at the 1982 IWC meeting did not lead to it being substantiated - in fact serious doubt has been cast on its validity and the IWC abandoned it as a basis for management decisions. Attempts to assess the trends in population sizes and the absolute numbers, from studies of catches per unit effort, were also abandoned. Thus the present situation is that there is no evidence that the populations had been naturally increasing and nothing is known about population trends since whaling began. It is very likely - some scientists say almost certain - that the numbers of minke whales are, at least in some areas, substantially lower than they were in 1971. Attempts have been made to estimate population sizes in certain areas from recent mark-recapture experiments, but the results have been judged to be unreliable. Estimates from systematic sighting cruises conducted in recent years indicate that the exploitable population of minke whales in the Southern Hemisphere may total about 300,000.

It will be realised from the above summary that there are no estimates of sustainable yields, current or maximum, for any stock/population of minke whales, nor knowledge about present population levels relative either to initial levels or "optimal" levels - i.e. those which would provide maximum sustainable yields.

23. Habitat: It has been mentioned that, although it turns out there is no substantive evidence for it, it is possible that the environmental carrying capacity for minke whales increased in the Antarctic in recent decades, as a result of a presumed increase in food supply. The opposite is the case in the Northern Hemisphere. There, minke whales largely feed on small fish, and the populations of many of these have in the last decade or so been greatly reduced by the development of fisheries. This has a bearing on the interpretation of attempts to estimate both

population numbers and sustainable yields, even though these have been largely unsuccessful. It is that all estimates from population models are derived from assumptions that the environment is otherwise unchanging during the period of whaling. If in reality there has been a decline in environmental quality, whether by depletion of food supplies or by other causes, then any assessments made will be biased optimistically upwards.

There is complete uncertainty about the geographical range of this species and any changes in it. It is suspected that the fact that no trends are detectable in Antarctic catches per unit effort may be a result of distributional changes. The catch rates reflect, if anything, the density of whales at the ice edge. It has been suggested that even if the population size is substantially reduced by whaling this density at the best feeding location will be maintained at the constant high levels, while densities and range behind the "front " will diminish. (Similar speculations have been made about other species and stocks of whales, the sperm whale in the North Pacific being an example, though with a different pattern of exploitation).

There is no information about the effects, if any, of various kinds of marine pollution on minke whales.