

## **On Catching (or Not Catching) Whales: A Case Study**

### History

The International Whaling Commission (IWC) was created in 1946 by the International Convention for the Regulation of Whaling, which was signed in that year. This treaty came about as the result of concern that whale stocks were not being utilized by the whaling industry in an efficient way. Since whales are harvested from international waters, international regulation was deemed necessary to address the conflicting concerns of the many countries involved.

According to the IWC charter,

The Commission may amend from time to time the provisions of the Schedule by adopting regulations with respect to the conservation and utilization of whale resources, fixing: (a) protected and unprotected species; (b) open and closed seasons; (c) open and closed waters, including the designation of sanctuary areas; (d) size limits for each species; (e) time, methods, and intensity of whaling (including the maximum catch of whales to be taken in any one season); (f) types and specifications of gear and apparatus and appliances which may be used; (g) methods of measurement; and (h) catch returns and other statistical and biological records.

In response to the near extinction of several whale species during the 1970's, the IWC declared a general moratorium on the harvesting of whales, which took effect in 1986. The United Nations supported the resolution by requiring all its member states to cooperate with the commission in obeying and enforcing its recommendations. This, in effect, gave the IWC a virtual international monopoly on whaling: ignoring internal disputes between member nations, it could (more or less) unilaterally exercise its powers as laid down in their charter.

However, beginning in the early 1990's, controversy over this moratorium has erupted, in large part because of petitions, presented by indigenous arctic tribes, asking for the right to hunt whales again. In addition, countries with industrial whaling fleets, such as Japan, have continued to exert pressure on the IWC to lift the ban, arguing that the ban is economically inefficient and unfair to countries that rely on the sea for much of their food. The result was the adoption, in 1994, of the "Revised Management Procedure" (RMP) which called for a committee to design a whale harvesting program that would satisfy the whaling industry in the short term while maintaining population levels for future generations. And while whaling today is still generally prohibited (except for "scientific" purposes) it seems likely that some species will be opened to commercial hunting in the near future.

### One Possibility: A Controlled Catch of Minke Whales

The minke whale is one of the species that is being considered for hunting in the near future. The current population of minke whales in the Northwest Pacific Ocean and Okhotsk Sea is estimated by the IWC scientific committee to be about 30,000. Marine

biologists hypothesize that, given current conditions, the number of minke whales (denoted by  $W$ ) is changing in size according to the finite difference equation

$$W_{t+1} = W_t + .2(10^{-5})W_t(100,000 - W_t) - 1500 - C_t$$

Where  $t$  (time) refers to an integral number of years,  $W_t$  refers to the whale population at year  $t$ , and  $C_t$  refers to the whale catch of year  $t$ . If the right-hand side of the above equation should become negative for some  $t$ , the value of  $W_{t+1}$  must be replaced by zero. Under the idealization of the model, harvesting ( $C$ ) for a year  $t$  takes place at the end of the year (December 31 of year  $t$ ) and the population ( $W$ ) for the same year  $t$  is measured at the beginning of the same year (January 1 of year  $t$ ).

With these two pieces of information, it is possible to project the current minke population into the future for any possible catch size. The problem now facing the commission is this: "How can we use our powers (as designated in the charter and enforced with the help of the U.N.) to assure high present value to the whaling countries while keeping the catch level sustainable, so that whale species will not be hunted to extinction through time?"

Now suppose that you are a decision-making consultant to the IWC, hired to help analyze the situation. How would you proceed?

The IWC has been around for 52 years. Japan and Norway

By hunting whales in the Southern Ocean Whale Sanctuary, Japan is in violation of articles 65 and 120 of the United Nations Convention on the Law of the Seas, (UNCLOS =96 adopted in 1982) which requires all states to cooperate with the International Whaling Commission (IWC) in the matter of whale protection. Each year the IWC passes a resolution condemning Japan for whaling in the Sanctuary and calls on it to stop its whaling program.

The IWC formally declared the Southern Ocean around Antarctica a whale sanctuary in 1994, and the area has been off limits to commercial whaling ever since. Despite this, Japan has a target to kill 440 Minke whales inside the Sanctuary this year, and the whale meat produced during the hunt will be sold on the open market in Japan.

Japan's whaling in the Southern Ocean Sanctuary is part of a strategy to overturn international agreements to protect whales. Japan, with the support of Norway, is actively lobbying to lift the current ban on the international trade in whale products at the International Meeting of Convention on the International Trade in Endangered Species (CITES) to be held in Nairobi, in April 2000. Japan has also embarked on a concerted effort to convince over a dozen developing countries to become members of the International Whaling Commission (IWC) and vote with Japan to resume large scale commercial whaling world- wide in exchange for foreign aid from the Government of Japan.

Charter of IWC:

1. The Commission may either in collaboration with or through independent agencies of the Contracting Governments or other public or private agencies, establishments, or organizations, or independently

(a) encourage, recommend, or if necessary, organize studies and investigations relating to whales and whaling;

(b) collect and analyze statistical information concerning the current condition and trend of the whale stocks and the effects of whaling activities thereon;

(c) study, appraise, and disseminate information concerning methods of maintaining and increasing the populations of whale stocks.

2. The Commission shall arrange for the publication of reports of its activities, and it may publish independently or in collaboration with the

International Bureau for Whaling Statistics at Sandefjord in Norway and other organizations and agencies such reports as it deems appropriate, as well as statistical, scientific, and other pertinent information relating to whales and whaling.

#### Article V

1. The Commission may amend from time to time the provisions of the Schedule by adopting regulations with respect to the conservation and utilization of whale resources, fixing: (a) protected and unprotected species; (b) open and closed seasons; (c) open and closed waters, including the designation of sanctuary areas; (d) size limits for each species; (e) time, methods, and intensity of whaling (including the maximum catch of whales to be taken in any one season); (f) types and specifications of gear and apparatus and appliances which may be used; (g) methods of measurement; and (h) catch returns and other statistical and biological records.

Useful links:

For a text of the 1946 Charter of IWC, go to  
<http://ourworld.compuserve.com/homepages/iwcoffice/Convention.htm>

For the most recent (1998) IWC resolutions on whaling, go to  
<http://ourworld.compuserve.com/homepages/iwcoffice/Schedule.htm>

To browse the IWC homepage, go to  
<http://ourworld.compuserve.com/homepages/iwcoffice/>

Enumeration of all relevant decision criteria:  
<http://ourworld.compuserve.com/homepages/iwcoffice/Estimate.htm>

At the 1982 meeting the IWC had agreed to a pause in commercial whaling (or to use popular terminology, a 'moratorium') from 1986. The amendment to the regulations had included a clause that 'the Commission will undertake a comprehensive assessment of the effects of this decision on whale stocks and consider modification of this provision and the establishment of other catch limits'.