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Whales and Whaling

The U.S. Federal Water Pollution Control Act (Clean Water Act) of 1972 established a permit system by which anyone wishing to dredge or fill a wetland must apply for permission to the U.S. Army Corps of Engineers. The act also required an accounting of wetland loss in five-year reports, the first of which appeared in 1984 and reported that the continental United States had lost over half of the wetlands present at American independence, a loss rate of 60 acres per hour. Following these reports, wetland protection became a major electoral issue in the 1988 U.S. presidential election, which was marked by George H.W. Bush's extensive use of the campaign slogan "no net loss of wetlands." The U.S. government has assessed the status of wetlands since 1956, and claims that in 2004 there were 107.7 million acres (43.6 million hectares) of wetlands in the conterminous United States, 95 percent of which are freshwater and five percent of which are estuarine or saline.

International wetland conservation efforts are structured around the Ramsar Convention on Wetlands, signed February 2, 1971, in Ramsar, Iran. Signatory countries pledge to designate at least one Wetland of International Importance and to adopt policies and programs that promote wetland ecosystem health and awareness. In late 2006, there were 153 signatory nations and 1,629 wetland sites totaling 145.6 million acres (58.9 million hectares). The North American Waterfowl Management Plan (NAWCA) implements the Tripartite Agreement on wetlands between the United States, Canada, and Mexico, which directs funding and research on wetlands throughout the continent. Both the Ramsar Convention and the NAWCA focused originally on wetlands as bird habitat, but have expanded their scope considerably.

SEE ALSO: Clean Water Act (U.S. 1972); Swamp Land Acts; Water; Watershed Management; Wetland Mitigation.

BIBLIOGRAPHY. William Mitch and James Gosselink, *Wetlands* (Van Nostrand Reinhold, 1993); National Research Council, *Wetlands: Characteristics and Boundaries* (National Academy Press, 1995).

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WHALES BELONG TO the mammalian order Cetacea (whales, dolphins, and porpoises), which in turn is divided into two extant groups, Mysticeti (baleen whales) and Odontoceti (toothed whales). The former group includes most of the large or "great whale" species, such as the blue whale and humpback whale, all of which are filter feeders. These latter whales use baleen plates (mostly made of the protein keratin) in place of teeth to sieve prey species out of seawater. The mysticete whales breathe through two closable blowholes, as opposed to one blowhole in the toothed whales. The odontocetes include the other "great whale," the sperm whale, and a variety of other families of cetaceans including beaked whales (family Ziphiidae), dolphins (family Delphinidae), and porpoises (family Phocoenidae). The moniker *whale* historically refers to a large cetacean and is not a biological term. Indeed, several "whales" such as killer whales and pilot whales are, in fact, dolphins.

Humans have utilized cetaceans since prehistory. In Europe, the Anglo-Saxon and Nordic peoples conducted hunts for large baleen whales, primarily coastal species such as the now extinct Atlantic gray whale, from at least the 9th century. Indeed, whales were so much a part of Nordic life that several laws were drawn up in the middle ages as to the ownership and disposition of whale carcasses. Whaling also took place in Japanese waters since at least the 3rd century C.E. by "driving"—that is, trapping whales and dolphins in small bays where they were then killed.

Whaling as a commercial activity began with the French and Spanish Basques in the middle of the 11th century, who hunted North Atlantic right whales, bowhead whales, and Atlantic gray whales. Much of the Basque whaling was originally concentrated around the Atlantic coasts of Spain and France; however, as whales became scarce in the Bay of Biscay, whalers expanded their area of activity and were hunting in Canadian waters as early as 1526. Commercial whaling operations by the Dutch and English began in 1610, often using experienced Basque whaling men on their crews. The Danes followed suit shortly after. Colonists of New England began whaling in the early 17th century,



although Native Americans had been practicing whaling since before the arrival of Europeans. Germans began whaling in 1694, but Dutch and British fleets dominated the industry in the 17th century, with the British taking the lion's share in the 18th century.

These whaling activities again focussed on North Atlantic right whales and bowhead whales in arctic and subarctic Atlantic waters. Indeed, the right whale gains its name because it was considered to be the "right" whale to hunt—it was slow, primarily found in coastal waters, it had a thick blubber layer that yielded much oil, and when the animal died it did not sink. Although records and archaeological evidence are scarce, the Atlantic gray whale is believed to have been rendered extinct during this period, with whaling possibly being the final straw for a perhaps already vulnerable species.

Early Basque whalers used every part of the whale, from the consumption of the meat, to the use of the feces as an orange-colored dye for clothing. However, the main product of commercial whaling was whale oil, which was used not only for lighting but also in industrial processes such as soap making. Baleen was also utilized, and in many respects this "whalebone" was the plastic of its time, being strong yet flexible. Many European whalers indeed concentrated on whalebone as a resource, particularly when the ladies' fashions of the day enlarged the market for whalebone-reinforced garments. In other nations, whalebone was used to make household tools, such as brooms in Barbados.

EXPANSION OF COMMERCIAL WHALING

As commercial whaling progressed, the focus shifted to collecting only the most profitable oil and whalebone. The most famous description of commercial whaling is Herman Melville's 1851 novel *Moby-Dick*. The book describes sperm whale hunting, which began in 1712 and had its heyday between 1740 and 1880. The head of the sperm whale contains a fine oil known as spermaceti, which was used to lubricate clockwork and delicate machinery in particular. The stomachs of sperm whales also occasionally contained lumps of a waxy substance called ambergris, also a valuable commodity. It was

used as a fixative in the production of perfumes and was literally worth more than its weight in gold. Sperm whale meat was considered inedible and was rarely consumed by whaling crews.

The method used to catch whales in this era involved setting down a number of rowed catching vessels. When close enough to the whale, the harpooner—a practitioner of an extremely skilled, valued, but dangerous profession—would hurl his harpoon into the side of the whale, where its swiveling head would lodge firmly. The wounded whale would then try to escape or dive. However, the harpoon would be attached by rope to the catching boat, which would then act as a buoy, and be dragged along by the fleeing whale in what became known as a "Nantucket sleigh ride."

Eventually the whale would become exhausted or fatigued due to blood loss, and the catcher boat could approach more closely, when it would finish off the whale with a number of strikes from a long, thin whaling lance. This type of catching technology limited the size, species, and locations of whales that could be caught. However, in the mid-19th century, the development of steam-powered whaling ships and catching boats, grenade-tipped harpoons, and cannons to fire them meant that larger and faster whales could now be caught, including species such as blue, fin and sei whales. The methods used to kill whales have remained largely unchanged for the last 150 years. The age of "modern" industrial whaling was born.

MODERN AGE OF WHALING

Typically, many species of hunted whales were brought back to a shore-based whaling station where they were processed and the blubber was rendered. In 1925, another technological innovation, the invention of large, ocean-going factory ships, meant that whales could be processed at sea, and operations were no longer tied to shore bases. This opened up new regions for intensive exploitation, in particular the waters of the Southern Ocean around Antarctica. Other technological innovations such as larger vessels, spotter planes, and the use of sonar to detect whales and drive them to the surface increased the ability of whalers to catch animals.



By 1931, in recognition of the fact that some whale species were in decline and of the potential impacts that this might have on the whaling industry, the main whaling nations negotiated and signed the Convention for the Regulation of Whaling. Due to depletion of the species, bans on whaling were introduced for bowhead whales (1931), southern and northern right whales (1935), and Pacific gray whales (1937).

This convention eventually led to another agreement, the 1946 International Convention for the Regulation of Whaling, which formed the International Whaling Commission (IWC) in that same year. The IWC is now recognized internationally as the competent authority for the management of whale stocks. Under the IWC, more whaling bans were introduced for humpback and blue whales (1966) and sei whales (1979; except in Iceland). Finally, in 1982 the IWC voted to introduce a temporary moratorium on all commercial whaling, which came into effect in 1986. This moratorium was put in place to allow depleted whale stocks to recover and to allow the development

of a better and more effective whaling quota system that would result in a sustainable whale catch. It is important to note that the IWC whaling ban only covers commercial hunting of baleen whales (except the pygmy right whale) and sperm whales. It does not stop scientific or subsistence whaling and hunting, commercial or otherwise, of all other cetaceans not controlled by the IWC.

CURRENT WORLD STATUS

Up until the date of the moratorium, over two million whales had been killed through commercial whaling, with many species such as the blue, fin, humpback, and sei whale becoming endangered. Even since the whaling moratorium came into effect, over 25,000 whales have still been killed. When the moratorium was enacted, Norway took a reservation on (opted out of) the ban and is not bound by the moratorium. It resumed commercial whaling in 1993, and in recent years Norwegian whalers have been taking approximately 550–700

The International Whaling Commission

The International Whaling Commission (IWC) was established on December 2, 1946. Since the 1980s it has been the primary mechanism for the ending of commercial whaling around the world. The IWC is a voluntary agreement with organizational headquarters in Cambridge, England, and has 70 member nations that meet annually to discuss limits on whaling. From the 1960s, it imposed quotas on the number and type of whales that could be caught with the aim of allowing the whale stocks to replenish—at the time some species were being hunted almost to extinction. Some countries, notably the Soviet Union, secretly flouted these quotas by massively under-reporting the number of whales killed. Gradually the main whaling nations of Japan, Norway, and Iceland found themselves outnumbered by the anti-whaling countries.

In the 1980s, the IWC voted to end commercial whaling, allowing it to take place on two grounds:

Scientific whaling and whaling by aboriginal peoples. Norway started commercial whaling again in 1994, but at massively reduced levels, and Iceland started again in September 2006. The Japanese have never stopped whaling, claiming scientific research purposes. However, critics have seen the research as merely an excuse to continue operating whaling fleets while the meat goes to restaurants and retailers.

In recent years, the Japanese have been persuading Pacific and Caribbean countries to join the IWC and support their attempts to lift bans on commercial whaling. Conservation groups claim that Japanese overseas aid to poor countries in the Caribbean, the Pacific, and Africa has been directly tied to these countries' support in the IWC. There has also been criticism of the eight landlocked countries that are members of the IWC: Mali and Mongolia supporting the resumption of whaling, with Austria, the Czech Republic, Luxembourg, San Marino, Slovakia, and Switzerland opposing whaling. The IWC continues to maintain a moratorium on all commercial whaling.



northern minke whales a year, although a quota of over 1,000 animals was proposed for 2006.

Japan also hunts whales, even though its government agreed to the whaling moratorium. They do this by using a provision in the convention that allows whales to be killed for scientific research. After samples of blubber and stomach contents are taken from killed whales, meat is processed and sold in Japanese markets for human consumption. Japan currently hunts northern minke, Bryde's, sperm, and sei whales (151, 50, 10, and 50, respectively, in 2003 and 160, 51, three, and 100, respectively, in 2004) in the North Pacific and Antarctic minke whales (443 in 2003, 441 in 2004) in the Southern Ocean for scientific purposes. There are currently proposals to double the take of minke whales in the Southern Ocean and also to add fin whales, and eventually humpback whales, to the list of species being hunted in the Antarctic scientific whaling program. In 2003 Iceland also started a scientific whaling program, catching 37 animals in 2003 and 25 in 2004.

The sale of whale meat in Japan and Korea has some controversy attached; for example, genetic analyses have discovered the meat of endangered blue whale and protected J-stock minke whale being sold illegally. In addition, whale meat sales have provoked some environmental health concerns: Recent research has shown that meat being sold for human consumption in Japan had extremely high levels of mercury. Average contamination levels in meat were 22 and 18 times higher than health regulation limits permitted by the Japanese government, with some samples exceeding these limits by up to 200 times.

Another aspect of whaling is so-called aboriginal whaling. This is a type of hunt that is allowed by the IWC for aboriginal, indigenous, or native peoples that have a nutritional and cultural need for whale meat, with all products of the hunt to be consumed locally. Currently there are subsistence quotas allocated for Bering Sea bowhead whales (used by American and Russian natives), eastern Pacific gray whales (also used by American and Russian natives), Atlantic humpback whales (used in St. Vincent and the Grenadines), and north Atlantic fin and minke whales (used by Greenland natives). A hunt by the Makah Tribe of Washington State has not been conducted in recent years due to domestic legal issues. Although less controversial than commercial and scientific whaling,

there are also some problematic issues with respect to aboriginal whaling in some areas; for example, the bowhead hunt by Alaskan natives occurs despite the bowhead whale being considered endangered under the U.S. Endangered Species Act.

Since the 1980s nations with a voting history of pro-conservation or antiwhaling tendencies, such as the United States, most European countries, New Zealand, and Australia, have been in the majority. However, in recent years the number of countries with a pro-commercial whaling stance has increased at the IWC, as have calls to lift the commercial whaling moratorium on populations that are considered to be showing signs of recovery. In the meantime, in Western countries there is strong and increasing societal opposition to a resumption of commercial whaling; in 1999, a survey found that less than one-fifth of Americans supported whaling of even abundant whale species, with 70 percent stating that they were opposed to the killing of whales on moral grounds. A similar survey in Scotland reported that 96 percent of the members of the public interviewed were opposed to whaling.

SEE ALSO: Endangered Species; Endangered Species Act (ESA); Indigenous Peoples; Mercury; Overfishing.

BIBLIOGRAPHY. T. Endo et al., "Mercury Contamination in the Red Meat of Whales and Dolphins Marketed for Human Consumption in Japan," *Environmental Science and Technology* (v.37, 2003); S.R. Kellert, *American Perceptions of Marine Mammals and Their Management* (School of Forestry and Environmental Studies, Yale University, 1999); William S. Perrin, Bernd Wursig, and J.G.M. Thewissen, eds., *Encyclopedia of Marine Mammals* (Academic Press, 2002); N. Scott and E.C.M. Parsons, "A Survey of Public Opinion in Southwest Scotland on Cetacean Conservation Issues," *Aquatic Conservation* (v.15, 2005); J.R. Twiss, Jr., and R.R. Reeves, eds., *Conservation and Management of Marine Mammals* (Smithsonian Institution Press, 1999).

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