Wildlife refuge system: Refuge for whom?

In 1903, prompted by the slaughter of birds for the millinery trade, President Theodore Roosevelt created the first National Wildlife Refuge to protect pelicans, egrets and herons. Today there are 90 million acres in the National Wildlife Refuge System, representing most of the ecosystems found in the United States. Charged by law with protecting wildlife, the refuge system has adopted a patchwork of practices, with considerable numbers of the refuges allowing hunting, trapping, timber cutting, grazing, farming and even oil and gas development, in addition to use for public recreation.

Amid an intensifying debate over such practices, the U.S. Fish and Wildlife Service (FWS), which manages the refuge system, is now beginning a major evaluation of its policies. After a series of public hearings and a call for written comments between now and May 3, it plans to prepare an Environmental Impact Statement (EIS) on the operation of the refuge system. Environmental groups see this evaluation as their opportunity to pressure the service to curtail "consumptive" activities on the refuges. Organizations representing recreational hunters and trappers are also testifying to preserve their use of the areas.

"We are interested in the changing public concept of what the refuge system should be," says Noreen Clough of FWS. She says conservation groups are demanding new focuses of wildlife management, for example on nongame species of animals or on biological diversity. Some environmentalists oppose the deliberate protection of any animals, except threatened or endangered species, at the expense of others.

The preparation of an EIS is a routine procedural matter, says a spokesperson for the FWS. The last statement was done 10 years ago, when the system contained less than half its current acreage. But John Grandy of the Washington, D.C.-based Humane Society of the United States says the evaluation is also the result of a lawsuit brought by his organization challenging all sport hunting programs on the wildlife refuges.

"Refuges are no longer regions of sanctuary," says Jennifer Lewis of the Humane Society. According to FWS records, she says, more than 400,000 refuge animals each year are killed by hunters and trappers, and millions of birds there are killed by poisoning attributable to lead shot. In addition, hunting disrupts other recreational uses of the refuges.

Clough, however, describes the current hunting policy, which permits hunting on 250 of the 434 refuges, as "a legitimate management tool on many refuges." Otherwise, she says, certain populations would grow too large for the habitat. "It is also a legitimate recreation," she says, "where it can be performed without detriment to other populations and where adequate funds are available."

The economic activities, such as timber cutting and farming, are primarily spin-offs of the management policies, Clough says. For example, arrangements are made with lumber companies to thin a forest to enhance the habitat for certain species, and farmers of refuge lands are required to leave a proportion of their crops to feed the waterfowl.

In recent years, the FWS has been encouraged by the Department of the Interior to obtain money from economic activities to offset the costs of the refuges. "The activities are permitted when they are not incompatible with the other purposes of a refuge," Clough says.

Environmental groups say the current emphasis on hunting and economic activities is inappropriate and destructive to wildlife and its habitat. They point to several refuges where the FWS staff has recommended decreased grazing or haying, yet the activities have instead increased.

The environmentalists object especially to the oil and gas activities, which have no management value. These activities destroy wildlife habitats through road, well and pipeline construction, oil and gas leaks, and residual pits filled with brine or drilling muds, says Amy Skilbred of Defenders of Wildlife in Washington, D.C. Gas wells now threaten the habitat of endangered red-cockaded woodpeckers on a Louisiana refuge, she says, and the Department of the Interior is considering a land exchange that would introduce oil and gas drilling into the calving area, on a refuge, of the world's major caribou population.

The variety of activities permitted on refuges reflects, in addition to management strategies, the different ways by which the lands were acquired, says the FWS. Some refuges were created with specific provisions for sport hunting or preservation of particular species. In most cases where there is oil and gas exploration, Clough says, the land has been donated by an owner who retains mineral rights and thus later can build oil and gas wells on the refuge.

"We welcome the EIS's review," says Skilbred. "We believe that [it] will help to put the system back on the road toward achieving the goal of wildlife and habitat conservation and enhancement."

— J.A. Miller

Leg 107: Seafloor spreading, sinking

The Tyrrhenian Sea is that small ocean basin in the Mediterranean that looks as though it's forever being kicked around by Italy. It kicks back now and then with earthquakes and volcanoes, so it's known to be a geologically active area. But scientists on Leg 107 of the Ocean Drilling Program were surprised to find just how active an area it has been over the past 5 million years or so.

As the *JOIDES Resolution* crisscrossed the sea early this year from the coast of Sardinia southeast to the toe of Italy, scientists were looking at the evolution of the basin from two perspectives: They were investigating the history of the young passive margin, or continental edge, on the northwest side of the basin; and they were reconstructing the way the basin has opened at sites in the southeast over several million years.

The passive margin (there is no plate boundary at that point) of the Tyrrhenian provided an opportunity to study a structure common to oceans throughout the world. "It turns out that in the classic places [where] people look at passive margins, like off the coast of New Jersey, the passive margins are old. . . . [T]he earliest part of the history is very deeply buried and hard to get to by drilling," says Kim Kastens, co-chief scientist on the leg and a marine geologist at Lamont-Doherty Geological Observatory in Palisades, N.Y. The Tyrrhenian margin, she says, "was younger and didn't have very much sediment, so we could get all the way down, deeper into the history of opening." The scientists recently made public some of their Leg 107 findings.

Drilling at three sites brought up evidence that the margin rifted and sank at different times in different places. On the upper Sardinian margin, the core showed a "textbook example" of a transition from a continental to a marine environment as the crust subsided. Overlying the marine sediments, the scientists found "evaporites," sediments laid down during the dessication of the Mediterranean about 5 million years ago. At sites on the lower Sardinian margin, the crust apparently didn't subside as early: The depositions of that age indicate a lake or open-air environment.

"What we wanted to demonstrate is that [the history of such a passive margin] can be a complicated story," says staff scientist Christian Auroux.

Drilling at the Tyrrhenian's two deep basins also indicated that the locus of seafloor spreading apparently jumped from the Vavilov Basin, about halfway down the coast of Italy, into the Marsili Basin to the southeast. The proof of that came when scientists dated basalts brought up from Vavilov Basin at about