

many or more weed seeds and as much or more sugar than conventional plots. For example, plots sprayed with glyphosate early in the growing season yielded up to 38 times more weed seed and at least as much sugar as conventional plots. Plots sprayed with

glyphosate in the middle of the growing season yielded about as much weed seed and about one-tenth more sugar than conventional plots.

This means that GM beets could help farmers optimize sugar yield and conservation benefits as desired. "With-

out [sugar] yield loss, they can enhance weed seed banks and autumn bird food availability, compared with conventional management, or provide early season benefits to invertebrates and nesting birds," say May and his colleagues. 🐦

Restoration Mistakenly Helps Pest Gulls



Yellow-legged gull (*Larus michahellis*). Photo by Elena Villuendas

Martínez-Abraín, A. et al. 2005. Unforeseen effects of ecosystem restoration on yellow-legged gulls in a small Mediterranean island. *Environmental Conservation* 31(3):219-224.

Habitat restoration can have unexpected and unwanted effects. New research shows that restoration efforts on a small Mediterranean island helped a gull that was already superabundant and that preys on two at-risk seabirds.

"When designing a conservation project, you have to be concerned with the side effects your actions can cause, especially in places such as the Medi-

1. Instituto Mediterráneo de Estudios Avanzados at the Consejo Superior de Investigaciones Científicas, Universitat de les Illes Balears

terranean, where the human hand has shaped natural systems for thousands of years," says Alejandro Martínez-Abraín of IMEDEA (CSIC-IUB)¹ in Palma de Mallorca, Spain, who, with five coauthors, reported this work in the September 2004 issue of *Environmental Conservation*.

Benidorm Island has long been overgrown by prickly pear cactuses (*Opuntia maxima*), which were introduced from the New World in the mid-1500s, and has more recently been overrun by tourists, who can easily reach the 6.5-hectare island because it is only 3 km from the mainland. This habitat deg-

radation is no problem for the yellow-legged gull (*Larus michahellis*), which has thrived to the point that it is considered a pest locally. But these changes are a big problem for two species of at-risk seabirds that the yellow-legged gull preys on, the European storm petrel (*Hydrobates pelagicus*) and Audouin's gull (*Larus audouinii*). Benidorm has one of the largest remaining colonies of European storm petrels in the western Mediterranean and a captive-rearing program for Audouin's gulls.

The island was designated a European Union Special Protection Area for birds in 1990, and the best way to restore it seemed to be a three-pronged approach of controlling the prickly pear, the tourists, and the yellow-legged gulls. Since 1999, about 200 metric tons of prickly pear have been removed, and tourists have been restricted to the main trail. In 2002, the researchers pricked the eggs in one-third of the yellow-legged gull nests.

Much to their surprise, however, the researchers found that the gulls ended up doing even better than before. The colony grew from about 300 pairs to 400-600 pairs, and the number of fledglings per pair increased by 75 percent (from 0.4 to 0.7). What went wrong? The researchers attribute the colony's growth to the fact that tour-



ists were no longer running all over the island, thus giving the gulls more nesting habitat. The higher number of fledglings may arise from the fact that the chicks in untouched nests had bigger territories and so were less vulnerable to being eaten by adult gulls.

The researchers have since brought the yellow-legged gull's fledgling numbers back down by pricking more eggs, although such cullings are controversial. It turns out that removing the prickly pear could also help control these pest gulls, which prefer to nest in

the cactuses' shade. Either way, restoring Benidorm remains a work in progress. "Gulls are long-lived, and all these management activities are of no use unless applied at a large scale and during a long period of time," says Martínez-Abraín. 🐼

Loophole in Leatherback Turtle Conservation



Leatherback turtle (*Dermochelys coriacea*) in Skidegate Inlet, British Columbia, Canada. Photo by Laurie Gordon

James, M.C., C.A. Ottensmeyer, and R.A. Myers. 2005. Identification of high-use habitat and threats to leatherback sea turtles in northern waters: new directions for conservation. *Ecology Letters* 8:195-201.

Protections for the critically endangered leatherback turtle (*Dermochelys coriacea*) don't go far enough. Whereas the focus has been on protecting migrating sea turtles from longline fisheries in the open ocean, new research shows that many North Atlantic leatherbacks spend their summers feeding in coastal and shelf waters off Canada and New England, where they are also vulnerable to fisheries.

"Unless conservation efforts expand to coastal and shelf areas, present efforts alone will not be sufficient to

save the species," say Michael James, Andrea Ottensmeyer, and Ransom Myers of Dalhousie University in Halifax, Nova Scotia, in the February 2005 issue of *Ecology Letters*.

The largest turtles, with a length of nearly 2 m, leatherbacks live in every ocean, and their numbers have declined sharply worldwide over the last 20 years. This decline has been blamed largely on fishing gear, particularly the longlines that can entangle and drown sea turtles in the open ocean. However, longline fisheries are comparatively well-monitored and, until now, little was known about threats from other fisheries in the leatherbacks' Northern Atlantic range.

James and his colleagues satellite-tagged 38 leatherbacks off Nova Scotia over five summers (1999-2003) and found that turtles typically left in October, migrated south to tropical waters, and then returned to Nova Scotia in June, where they spent the summer feeding on jellyfish in continental shelf and slope waters. "The extended time periods during which leatherbacks use these northern areas place special emphasis on the need to protect turtles there," say the researchers.

To see what threats leatherbacks might face in their summer feeding grounds, James and his colleagues assessed 83 reports of the turtles' interactions with fishing gear in shelf waters off eastern Canada. Nearly all of these turtles were tangled in buoy lines, and nearly 20 percent of them were dead. Moreover, these reports probably underrepresent leatherback interactions with fishing gear in their summer feeding grounds because shelf fisheries are rarely monitored. This study "is breaking new ground," says Sebastian

Troëng, Scientific Director of the Caribbean Conservation Corporation in San Pedro, Costa Rica. "Bycatch in coastal and shelf fisheries may represent an even greater threat to leatherback survival than the more well-known threat of bycatch in oceanic fisheries." 🐼

