Reintroducing a Political Animal

What happens when the government moves sea otters around in California? Nobody is happy, including the otters, which try to swim home. Many attempts to relocate threatened species fail

Big Sur, California

TO PROTECT THE SEA OTTER from the ravages of man, government biologists are committed to scooping as many as 250 otters from their home waters off the jagged coast of Big Sur and flying them to an isolated island southwest of Los Angeles, where it is hoped the transplanted animals will establish a new and happy home. Unfortunately, the sea otters have not read the script.

Of the 63 otters carted to San Nicolas Island during the past 11 months, less than a fourth remain. The older and stronger animals swam back to the mainland. About half of the relocated otters have vanished. The rest went to Davy Jones's locker.

It seems that saving a threatened species can be a controversial and disheartening business, fraught with political peril and scientific strife. "Nobody realizes how frustrating these kinds of things can be.... Most reintroductions that are attempted, fail, and we never know why," says Galen Rathbun, a biologist with the U.S. Fish and Wildlife Service.

Despite such setbacks, the practice of reintroducing a species into a remnant of its former range has become a tool of choice among conservationists and wildlife managers. According to an unpublished survey by Michael Scott and Brad Griffith of the U.S. Fish and Wildlife Service and the University of Idaho, there are at least 500 reintroduction episodes each year in North America. Though the majority of these are aimed at establishing populations of game animals such as big horn sheep and wild turkeys (populations which are later culled by hunters), there are active or planned reintroductions for at least some of the 495 species listed as threatened or endangered in the United States. Particular attention is being paid to such glamorous subjects as bald eagles, red wolves, and sea otters. The U.S. Fish and Wildlife Service will spend about $30 million this year on activities related to species in peril.

No one wants to be against something as hopeful as the reintroduction of wildlife. For what could be wrong with alleviating some of the damage brought about by habitat destruction and exploitation? Thanks to reintroduction programs, for example, there are now 20 pairs of bald eagles nesting in Texas and eight red wolves loping through a swamp in North Carolina. But whether these costly and continuing reintroductions will succeed is unknown.

Biologists confess there are a number of problems with the practice. First of all, reintroductions often do not work. According to Scott and Griffith, of those reintroductions that can be judged, less than half succeed. For instance, the wildlife service has spent over $1.5 million since 1975 in a futile attempt to create a self-sustaining population of whooping cranes at Gray's Lake in Idaho. This spring, there were only 16 whooping cranes in the flock. None of the cranes have produced offspring, despite 13 years of encouragement, reports Jim Lewis, project coordinator for the wildlife service.

Says Tom Cade of the Peregrine Fund in Boise, Idaho: "Reintroductions are last-ditch and desperate efforts.... They can work, but they take lots of time and lots of money."

Certainly, a few reintroductions are working. Cade's falcons are a case in point. Nearly 2500 peregrines have been released into the wild since 1975. On the East Coast, there are now between 65 and 75 territories populated by captive-reared and released falcons. Says Cade: "In a few more years, we'll be back to where the population was before DDT took them down."

Yet, a continuing problem with reintroductions is that biologists must often contend with manipulating a dwindling species they do not fully understand. Wild animals in wild settings have a way of upsetting the best laid plans. Even though a great deal is known about the natural history of the peregrine falcon, for example, who could have guessed that falcons reintroduced into the wild would actually prefer eating pigeons and living in cities like Baltimore? As for the otters, the wildlife service never believed that so many otters would leave San Nicolas Island.

By all accounts, little has gone according to the elaborate Recovery Plan written for the sea otter. For starters, catching an otter in a dip net is not like plucking dead guppies out of an aquarium. Government biologists recently discovered that if a sea otter has been caught once, it is extremely difficult to catch again, particularly when the otter has a government-issue radio transmitter surgically implanted in its belly. Some otters have become so wary that the biologists have resorted to dispatching teams of Navy-trained scuba divers outfitted with special bubbleless rebreathers to sneak up on the otters while they are asleep. Even so, of the 30 otters sporting a surgical implant, only three could be recaptured and sent to San Nicolas. Once out at the island, all three eventually disappeared, thereby completely foiling a major experiment designed to com-

Jeff Foott, courtesy of U.S. Fish and Wildlife Service

Not a happy otter. *Galen Rathbun of the U.S. Fish and Wildlife Service uses a dip net to catch a young otter off the coast of Big Sur.*

pare the life-styles of mainland otters and transplanted otters.

In all, about half of the otters have vanished from San Nicolas Island. Upon release, one confused animal immediately began swimming in the direction of Hawaii. He has not been seen since. Most of the older otters also left. The lucky ones made it back to their breeding territories along the mainland, a remarkable swim across 200 miles, and a journey that is teaching the biologists something about the strong fidelity felt by otters for a particular home range.

At least ten otters are confirmed dead, the victims of stress or drownings or foul play. A few months ago, one of the relocated otters washed up near Point Mugu in southern California. She had a bullet in her head and chains wrapped around her body. Says Rathbun: "It looked like a gangland slaying."

Killing sea otters is nothing new, but the death of one of the reintroduced animals illustrates how emotional such a program can be. Like the gray wolf and the bald eagle, the sea otter has come to represent far more than just a unique set of genes. "The sea otter is a symbol," says Robert Brownell, a fish and wildlife service biologist heading the otter reintroduction program.

To the fishermen of California, the otters are seen as direct competitors that consume such commercial delicacies as pink abalone, red sea urchins, and spiny lobsters. To the oil industry, which hopes to drill wells off the coast of central California someday, the otters represent a potential stumbling block, since their federally protected status could hamper development. To the animals' advocates, otters are dewy-eyed and cuddly creatures that must be defended at all costs. And to the government biologists charged with protecting and managing the species, sea otters are proving to be fascinating and exasperating wards of the state. Says James Estes, a fish and wildlife service biologist at the University of California at Santa Cruz: "We were never trained to work in an arena where everything is controversial and everything is political."

The range of the sea otter, *Enhydra lutris*, was once the entire northern arc of the Pacific Rim, from Hokkaido in northern Japan, through the Kuril Islands and the Kamchatka Peninsula in the Soviet Union, across the Aleutian Islands of Alaska, and down the west coast of North America to the middle of the Baja Peninsula. But unfortunately, the otter's dense and supple pelt was much admired, particularly by the Chinese, who had an almost maniacal craving for the otter's fur, which they used as trim on their coats. A log entry from the Russian fur ship *Ilmen* notes that in 1815 Captain

The Otter-Urchin-Kelp Scenario

The reintroduction of sea otters to an isolated island off the coast of Los Angeles may provide researchers with a tidy laboratory in which to peel apart the complex and much debated interplay of otters, urchins, and kelp forests.

Since 1980, marine ecologists have been monitoring intertidal pools and subtidal habitats at San Nicolas Island by screwing stainless steel eyebolts into the sea floor and returning periodically to the same swaths of rocky benthos to record whatever happens to be there, be it encrusting algae, finfish, urchins, or kelp. Now for the first time in recent history there are also some otters to look at.

It is well known that sea urchins often wander about—albeit very slowly—to graze upon the holdfasts of kelp. Heavy overgrazing upon the macroalgae by the herbivorous echinoids have created denuded "urchin barrens." Think of urchins as a kind of goat of the sea.

It is also understood that sea otters have voracious appetites and are capable of ingesting about one-fourth of their body weight a day. Otters, like sushi gourmands, have a great fondness for the gonads of sea urchins. In the economies of foraging, urchins provide a valued and accessible prey item, since the otters need only dive to the bottom and pick them up—unlike an abalone, for example, which often requires repeated dives and use of a big rock to beat upon the creature until it loosens its hold.

The question, then, is do sea otters maintain the kelp forests by consuming the urchins that consume the kelp?*

James Estes and Glen VanBlaricom of the U.S. Fish and Wildlife Service in Santa Cruz suspect that otters have a profound and direct impact on kelp forests. Estes and his colleagues find support for the hypothesis by comparing areas with and without sea otters, by examining the historical records, and by mimicking otter predation with experimental patches of sea floor where all the urchins have been removed by man.

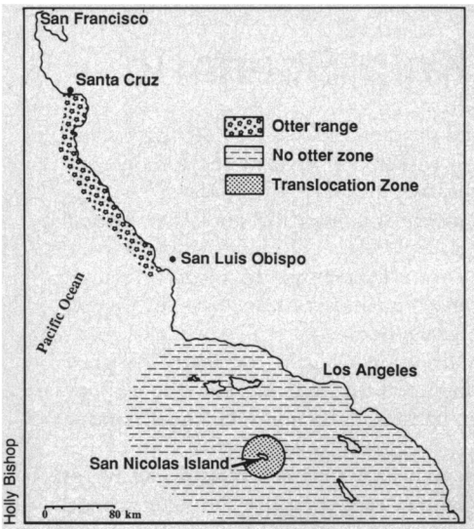
Estes says that in southeastern Alaska, for example, a population of otters moving into a new area has an immediate impact on urchins, followed by a rapid recovery of kelp. In cases where the urchins have been removed by researchers, Estes and Christopher Harrold of the Monterey Bay Aquarium report that "community structure in the experimental plots shifted from urchin barrens to algae dominated assemblages, whereas unmanipulated control plots remained unchanged."

But Michael Foster of Moss Landing Marine Laboratories in Moss Landing, California, disagrees with Estes and argues that the sea otter is not a "keystone" predator, but "another brick in the wall" in a highly complex system that is often in flux. Foster and David Schiel of the Fisheries Research Centre in New Zealand reviewed data from 220 sites in California outside the otter's range and found that deforestation by sea urchins is the exception rather than the rule. Dense forests of kelp often exist side by side with urchin barrens. Why? Foster believes that the otter-urchin-kelp hypothesis is overly simplistic and that other factors such as water motion, light, nutrient levels, and substratum are as important as sea otters.

The story has another twist. Urchins have two ways to make their living: they can actively graze or they can sit in crevices and wait for pieces of kelp to drift by. Harrold and Daniel Reed of the University of California at Santa Cruz found that "the intensity of grazing was independent of sea urchin density." What counted most was the amount of kelp that drifted by. In *Ecology* the two report: "At the beginning of the study the biomass of drift algae in the barren site was not sufficient to keep urchins well fed (as indicated by their low gonad indices). As a result, they actively grazed the substratum, preventing the establishment of macroalgae. . . . Once drift algae became available to the urchins, they switched from an active, grazing mode of feeding to a sedentary drift-feeding mode."

Harvesting kelp is $50-million-a-year business in California, while kelp forests also support a rich community of marine life, including a number of commerically exploited fish. To some extent, conservationists have sold the otter to resource managers and fishermen as an animal that could increase the vigor of the kelp forests, thereby encouraging a whole cascade of events. Out at San Nicolas Island, firmer answers may be forthcoming. ■ **W.B.**

**The Community Ecology of Sea Otters*, edited by G. R. VanBlaricom and J. A. Estes (Springer-Verlag, Berlin and New York, 1988).



Holly Bishop

Boris Tarasov and his crew obtained 955 otter skins during the 7 months they were stationed at San Nicolas Island. The bounty did not last for long. A diary entry from a Santa Barbara fur hunter noted that there were so few otters out at San Nicolas Island in the 1850s that it was hardly worth the trip.

By the turn of the century, the sea otter was so greatly exploited that some thought the species was extinct. By 1914, the California population is estimated to have been reduced to no more than 100 otters.

Since then, the otters have made a remarkable recovery. Today, there are more than 100,000 otters living in the Aleutian Islands of Alaska and 1,650 living in California, where the animal's range has slowly spread from Big Sur to include 200 miles of coastline from San Luis Obispo in the south to Santa Cruz in the north.

Yet despite such gains, the wildlife service considers the California sea otter population in a precarious position because more than 100 million barrels of oil travel through the sea otter's range each year. To protect the otters, the service called for the establishment of a second population of animals as a way of hedging the bet against devastation from a single spill.

Located about 70 miles southwest of Los Angeles, San Nicolas Island belongs to the Navy's Point Mugu Pacific Missile Test Area. Though the island is off-limits to civilians, its rich waters are actively fished. Pinning down the dollar value for the lost revenues due to the relocation of otters is a tricky thing. Gross annual loss of the shellfisheries is estimated to be between $106,000 and $264,000, according to the California Fish and Game Department. But Steve Rebuck, a spokesman for the group Save Our Shellfish, calls these figures "a joke. . . . The numbers are ten times that amount." Rebuck represents the anger and distrust felt by commercial fishermen in California when he refers to the entire otter project as "a hoax."

This ill will has led to a series of compromises between conservationists and the fishing industry. It was agreed that the otters could have San Nicolas Island but the rest of southern California south of Point Conception would be maintained as a "No Otter Zone." Any otter found in southern California is to be captured by a kind of otter-SWAT team and returned either to San Nicolas Island or the mainland population.

"It must be said: this is not a conservationist's dream. It's a compromise and like all compromises there are things we don't like about it," says Rachel Saunders, staff biologist for Friends of the Otters, a powerful 4500-member organization which follows with keen interest anything to do with threatened otters.

Neither are the fishermen happy. "The No Otter Zone is a bunch of baloney," says Rebuck, who contends that the mainland of southern California would never support many otters anyway because of the area's wide sandy beaches and lack of otter chow.

It may not matter. In the long run, the No Otter Zone may prove a difficult artifice to maintain. It is one thing to snatch a few truant otters that stray from San Nicolas Island. It is another to stop the mainland population's inexorable push south. Already a large group of males is within 70 miles of the No Otter Zone at Point Conception.

"All indications are that the mainland otters will continue to disperse and if you have to contain them, you're going to have to cull them. But to even suggest culling otters in California right now would be insane," says Estes. Instead, there is talk of sterilization and of implanting a birth control device in female otters similar to the ones used for deer. Also, the California Department of Fish and Game is experimenting with taking otters from the southern portion of their range and moving them to the northern edge, a kind of shell game that cannot last forever.

As for the success of the otter reintroduction at San Nicolas Island, it is far too early to tell. "If I was a betting man, I'm not sure which way I'd go," says Estes. The government is betting about $300,000 a year on the effort. Certainly, the biologists were surprised and dismayed to watch the island population dwindle. But the otters that remain seem to be happy, says Rathbun. It often takes years before a population is self-sustaining.

Starting next month, the government biologists will begin to capture as many as 70 otters to add to the small group left at San Nicolas. This time they will take mostly juveniles, which appear less likely to leave.

At the very least, the sea otter has taught biologists something about the difficulty of manipulating nature. Says Rathbun: "Sometimes, in my more private moments, I wonder what we're really doing for the critters."

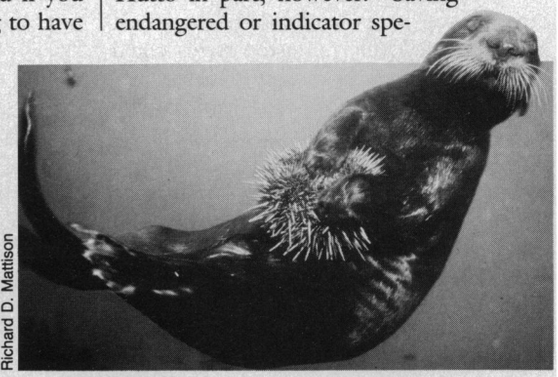
Some scientists are asking a similar question on a more general level by challenging the wisdom of allowing conservation efforts to be driven by a single endangered species rather than an entire ecosystem.

"We've become so focused on preserving a species here and a species there that we are losing sight of the habitat," says Richard Hutto of the University of Montana in Missoula. Hutto believes this narrow focus by the government on "management indicator species" is obscuring the real importance of preserving what Hutto calls "the integrity of patterns and processes" of an ecosystem. Says Hutto: "The species-dominated approach gives us the illusion that we can keep growing and keep destroying and then just mitigate the damage later with a reintroduction. . . . It's arrogance."

Cade of the Peregrine Fund thinks that Hutto may be missing the point. "When you save a predator, everything that the predator needs to survive, goes along with it," says Cade. This approach has been called "trickle-down conservation" by some researchers.

Many conservationists would agree with Hutto in part, however. "Saving endangered or indicator species is not the same as preserving biological diversity," notes Scott of the wildlife service and his colleagues in a reply to Hutto's critique in the pages of *Endangered Species Update*. Pragmatists though, Scott and his fellow authors point out that "it is easier to argue for funding to save a charismatic species than to save the abstractions we call ecosystems. It is no accident that there are only 13 insects among the 967 taxa listed in 1988 as threatened or endangered by the U.S. Fish and Wildlife Service."

■ WILLIAM BOOTH


Richard D. Mattison

Preferred prey. *An otter brings an urchin to the surface.*