



Sea Otters

*The "truth" about this marine mammal
...and the future of West Coast
shellfishing.*

THAT'S THE BEGINNING—when you start seeing broken shells," Rudy Mangué declares. "First one shell, then five... suddenly sea otters are there and the resource is gone."

Rudy Mangué, a commercial abalone diver in California for over 20 years, describes a sight he knows from experience. He was there during the 1960s when otters expanded along California's central coast, foraging the state's most productive abalone grounds, reefs that had produced nearly 2 million pounds of sea snails a year for 50 years. He saw the central coast abalone fishery collapse.

California Department of Fish and Game marine biologists documented the decline of abalone then; they've recorded the decline of other shellfish since. They attribute the loss directly to sea otter predation, but a lot of people still don't believe the evidence.

FISH OF THE MONTH

JACK AMES, CDF&G

Otter predation on Dungeness crab and clams became evident in northeastern Prince William Sound, Alaska, around 1976. A herd of otters moved into the Orca Inlet area in 1979, and during three years of research, one biologist documented individual otters eating, on average, over 80 clams and 22 Dungeness crabs daily. In a bay where otter numbers ranged from 25 to 180, he estimated that the herd ate 370,000 crabs in one year, altering their habits to forage nocturnally, when Dungeness are active.

The Alaska Department of Fish and Game closed the Orca Inlet Dungeness fishery for the first time on record in 1980. Once an important harvest area, it remains closed, and state resource managers think a continuing lack of harvestable crab will keep it closed. They feel the evidence warrants sea otter management in areas to prevent new conflicts as the otter population expands, a policy shellfishermen embrace. But John Burns, ADF&G marine mammal coordinator, warns, "There is growing opposition to the thought of managing marine mammals—especially sea otters. The argument is not one of resource management; it's one of emotions."

Charming Predators

Indeed, people can relate to otters, the smallest, most "human" of all marine mammals. Sea otters are charming, lovable; their dramatic comeback arouses public sympathy. But they are also efficient, opportunistic predators. That paradox has ignited perhaps the gnarliest controversy in the history of wildlife management—a classic battle over animal rights.

After sea otters were hunted to near extinction during the fur trade, shellfish mushroomed to virginal levels in the otter's diving range (extending 55 fathoms deep, although most foraging occurs inside 20 fathoms). Human shellfisheries developed on the abundance. Now that otters have returned (mainly in California and Alaska), who gets the shellfish? The obvious answer is to share, but biologically and politically it's not that simple.

Lacking blubber, otters rely on their dense fur and a high food intake, about 25 percent of their body weight daily, to survive in the ocean. (An average adult eats over 2 tons of shellfish a year.) In food-rich areas, otters feed selectively on preferred prey, apparently picking large items first. Depleting those, they diversify their diet, foraging progres-



A display of broken abalone shells gathered near Point Conception illustrates the characteristic sign of otter foraging.

sively down the food web until food becomes scarce. Because otters seem to have no major natural predators themselves, food scarcity may be the biggest factor limiting population growth when a herd reaches equilibrium density. Food depletion causes die-offs or spurs emigration to new areas. And emigration is the biggest threat to shellfisheries.

As food competition increases, subdominant male otters are forced to the ends of their established range. These "migrant front" groups, often numbering over 100 animals, colonize unoccupied habitat where prey is abundant. Eventually female otters spread into the vacated male areas, the population builds, and the cycle repeats, wavelike.

Large male otter groups sharply reduce shellfish numbers; recruitment of other otters into the area keeps prey abundance depressed. So while otters don't remove all shellfish, they preclude nearshore shellfisheries because human harvest is regulated by size limits, season and gear restrictions, even sex of the species. Otters take every shellfish they can catch.

Migrant front foraging eliminated shellfisheries in Prince William Sound and California. Sea otters have been seen eating nearly every shellfish species man harvests, an impressive list. As the otter population expands, what's the shellfishing forecast? That's still an open question, depending on species, depth range, area, biologists' opinions—and ultimately, public sentiment.

Otters and Alaska's Big Three

In Alaska, shellfishing is second only to salmon in fishery importance. Commercial landings for the "big three"—king, tanner, and Dungeness crab—totaled 98.7 million pounds, val-

ued at \$139.6 million ex-vessel, in 1983—a bad year. There are also smaller fisheries for scallops, razor clams, and abalone, among others. But established otter populations are competing with commercial and personal-use shellfisheries in parts of the Aleutian Islands, the southern Kenai Peninsula, Prince William Sound, and Southeast Alaska. Future conflicts are expected around the Kodiak Archipelago, the Alaskan Peninsula, the Gulf of Alaska, and Southeast.

Now numbering over 150,000 animals, Alaskan otters are nearing historic population levels along a coastline reputedly longer than the circumference of the earth. "Sea otters have expanded into most of their original range," says Karl Schneider, ADF&G sea otter biologist. "A lot of the coast is isolated and most of the problems aren't high-profile now," he adds, "but they probably will be in a few years."

Since the closure at Orca Inlet, sea otters have begun expanding east into the Controller Bay area, jeopardizing other viable Dungeness and clam fisheries. The 412 otters translocated to several sites in Southeast during the late 1960s now number about 1,800. Biologists predict the population may reach 9,000 in the next decade and reoccupy the entire outer coast.

The otter population at Kodiak Island is also growing; rafts of 300-400 otters inhabit some bays on the west side. Future expansion will likely impact the most productive shellfishing grounds, on the east-southeast side. Overall, Kodiak may be the single most important shellfishing district in Alaska; it contributed 52 percent of the statewide tanner crab and 40 percent of the Dun-

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geness harvest in 1983. (The district was closed for red king crab.)

Wherever otters forage in number, sedentary, shallow-water shellfish like abalone, sea urchins, and clams will sharply decline. Harder to pinpoint is the otter's long-term effect on mobile species. Dungeness crab abundance, for example, normally swings widely on natural cycles, making the impact of otter predation more difficult to predict. However, Dungeness inhabit the otter's diving range for much of the year, and biologists have documented evidence of otter predation. They expect future conflicts.

"A significant part of the tanner crab population inhabits the otter's depth range year-long," says Jerry McCrary, ADF&G shellfish research supervisor. "And red king crab under 4 years old live nearshore all year." Adults move deep in fall and winter, then return to the shallows in spring to molt, congregating in huge molting balls. Biologists as well as fishermen have seen otters eating red king crab, especially during spring. But, notes McCrary, king and tanner crab stocks have declined for several reasons. After years of abnormally warm ocean temperatures, cod and pollock populations have mushroomed and are preying on crab. Biologists think this may be causing a greater impact than otter foraging. "We haven't ruled out sea otter predation," McCrary adds, "but we haven't really discussed it, either."

So the jury is still out on at least two of Alaska's big three. Red king stocks are so depressed that most historically productive districts were closed in 1983. Added to other factors, otter predation won't hasten their recovery. Now sup-

planting reds in the marketplace, blue and brown king (less valuable economically) are deep-water crab, apparently unaffected by otter foraging. But fishing effort on Dungeness has increased in the last few years. As more fishermen diversify, they may have to rely on stocks suffering increased otter predation. Says Don Calkins, ADF&G sea otter biologist, "If we're going to have a commercial fishery, we'll have to do something about otters."

Protective Custody

However, the state now lacks management authority. The 1972 Marine Mammal Protection Act transferred jurisdiction for all marine mammals to the federal government. The U.S. Fish and Wildlife Service has protective custody of sea otters and is mandated to return otters to Optimum Sustainable Population levels. Because Alaskan otters are near Optimum Sustainable Population, Alaska can legally recover management — if the state files an application and adopts federal management requirements. To say the least, return of management is a lengthy, complex — and controversial — process.

"It has become a public policy issue," says ADF&G's John Burns. In Alaska, the sea otter problem is wrapped into a much larger debate over state marine mammal management, involving 10 species. None of the 10 are regulated under current federal law; some native and protectionist groups want things to stay that way.

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— Carol Fulton, spokeswoman for Friends of the Sea Otter

However, Sam Harvo, university professor and member of Alaska's Board of Game, points out, "Many marine mammals can be harvested for their own value. That's the approach we have to take. We need to exercise environmental sanity." Says Ancel Johnson, head of USF&WS Alaskan marine mammal research, "Sea otters and shellfisheries are mutually exclusive. People will have to make a decision. I think Alaska will have zonal management within the next decade, but management will be hard for some people to take — including me." (USF&WS supports the return of state management in Alaska. It is exploring federal management options, requiring amendment of the Marine Mammal Protection Act, in case the state bid fails.)

Long pursuing return of management, ADF&G is now staging meetings to test public feelings; the series should be completed by the end of 1984. The consensus will direct the governor's decision to file or not file the application.

Past that point, if the process gets that far and the application is approved, there will be Optimum Sustainable Population hearings, budget hearings, regulatory hearings. Majority opposition at any one of those could block progress. "We could strangle ourselves jumping through all the hoops," declares Lew Pamplin, director of ADF&G's Division of Game. "The real shouting will start with the formation of management regulations. Interest groups will have an opportunity to influence regulations adopted by the Board of Game."

Regarding sea otters, acceptable numbers and the how-to's of management have yet to be set. Decisions must be made on which areas to preserve for otters, which to reserve for shellfishing, and how to remove otters from shellfishing areas while still following Optimum Sustainable Population requirements set by the MMPA. Regulations will also be required for the other marine mammal species, although the state can opt to manage some and not others, if need be. "From a resource standpoint, to maintain a balance among a multitude of resources, it's important for Alaska to regain management," Pamplin says. "But personally, it's bound to give me more headaches." John Burns adds, "The areas, numbers, and impacts are more vast in Alaska, but the controversy over sea otters is the same as in California."

California's Threatened Otter

With one noteworthy exception: The management ball is now in Alaska's court; the state can choose to play or pass. In California, state sea otter management is still decades, maybe light years, away. "Southern" sea otters are listed as "threatened" in the Endangered Species Act (ESA). The 1977 ruling declared them an isolated population potentially jeopardized by a major oil spill that might eliminate most of the herd. It was a major victory for Friends of the Sea Otter, the California otter's own special-interest group. This listing automatically classes southern otters as "depleted" under the MMPA. And that changes the ball game.

Ranging over a 230-mile stretch of the central coast, California otters number about 1,300-1,500, roughly 10 percent of the state's historic population. CDF&G agents advocate zonal management: separate otter refuges and shellfishing zones. But under federal law, CDF&G cannot restrict otters to protect shellfisheries while the herd is depleted. To recover otters to Optimum Sustainable Population, USF&WS wants to translocate about 150 from the central coast, establishing new breeding colonies to allay the oil risk. And that's the crunch: where to put more otters in a state with too many people and no unused space? (Since southern otters once ranged the entire West Coast, why must a translocation be restricted to California?)

Compounding the problem, USF&WS has not yet defined Optimum Sustainable Population—how many otters in how many places are enough to remove the threat? CDF&G officials want zonal management guarantees before they agree to cooperate.

The ongoing debate has polarized protectionist against resource user. Now also implicated are expanding oil recovery efforts and new evidence indicating that maybe 50 or more otters a year may be drowning in gillnets, possibly stalling otter population growth. (CDF&G is contemplating emergency gillnet closures inside 15 fathoms in parts of the otter range, which would preclude a local halibut fishery.)

Resource users question the accuracy of the Endangered Species Act listing (nobody has proved that a major spill would impact the entire otter range). The Friends and USF&WS biologists support elevating the California herd to "endangered" status (in immediate danger of extinction). State and independent biologists disagree with the tone and content of USF&WS research, and vice versa. And in the impasse, after almost a decade of Endangered Species

Act protection, USF&WS has made little real progress in recovering southern sea otters.

Translocation Debate

"Things won't move until USF&WS declares where and when to translocate," says Bob Hardy, project leader of CDF&G's sea otter research team. Bill Shake, regional director of the USF&WS Endangered Species Office, responds, "We want to translocate, but the when, where, and if are still subject to public input."

The Friends advocate San Nicolas Island, gateway to the Channel Islands, as the first translocation site. USF&WS has already spent several years and about half a million dollars on baseline research there. Under pressure, USF&WS also commissioned a mapping study to identify other potential sites on the West Coast. Only four emerged: the northern Olympic Peninsula in Washington, the southern Oregon coast between Port Orford and Brookings; the northern California coast near Fort Bragg; and, of course, San Nicolas Island.

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—Congressman John Breaux, chairman of the Subcommittee on Fisheries and Wildlife Conservation

Southern Oregon lands over 20 percent of the statewide Dungeness catch; if otters emigrate north to Coos Bay, they could impact 50 percent of the fishery. Washington's Olympic Peninsula could support the largest number of otters; shellfishing conflicts are low (although a native Indian gillnet fishery operates seasonally). But expansion outside the translocation zone would jeopardize important shellfisheries, including a growing mariculture industry fostering several species in Puget Sound.

And the Washington site already has a small colony of Alaskan otters, translocated around 1970 and now growing rapidly. Several scientists think introducing California otters would benefit the gene pool; others suggest that Alaskan otters could replace California's herd in the event of disaster, thus eliminating the need for translocation. However, USF&WS biologists argue that interbreeding now might lessen the southern otter's "uniqueness," a finding that scientific tests will never completely prove or disprove.

In any case, Oregon and Washington resource managers want management guarantees before they support translocation. CDF&G opposes a translocation to Northern California. The Fort Bragg area sustains legions of sport abalone divers, a locally important Dungeness fishery, and northward otter expansion could jeopardize California's most productive Dungeness harvest grounds. (Technically, USF&WS can translocate without state approval, but federal officials prefer state cooperation.) So all roads lead back to San Nicolas Island, lying about 55 miles off the Southern California mainland, the focus of the southern sea otter controversy.

Shellfishermen and the oil industry feel reintroducing otters to the Channel Islands via San Nicolas is both illogical and, ironically, dangerous for otters. Oil recovery and tanker traffic are greater in Southern California than anywhere else on the West Coast. Even the mapping project, which rates San Nicolas with the best-documented habitat and lowest fishing conflict, finds the island to have the highest relative oil risk. (USF&WS biologists disagree.)

Representing shellfishing interests, a group called Save Our Shellfish argues that San Nicolas otters would eventually reach the other Channel Islands and curtail most Southern California shellfishing, including viable fisheries for sea urchins and spiny lobster (which

inhabit the shallows several months a year) as well as abalone. Eliminating those fisheries, all centered in Southern California, would deny recreational opportunity and put hundreds of commercial fishermen out of business.

San Nicolas itself is one of the few growth areas left for the commercial abalone fishery, a unique fishery that has already lost its most productive grounds to sea otters. The Channel Islands are the abalone industry's Waterloo. Although the advent of modern dive gear has spurred abalone declines through fishing pressure, not sea otters (reinforcing protectionists' claims that otters weren't responsible in the first place), commercial divers have begun a reseeding program that looks promising.

"We can restore the abalone resource if we just get out and farm it," says Earl Ebert, director of CDF&G's shellfish research laboratory. Indeed, open-ocean mariculture is a growing industry in Southern California with unlimited potential. But its future will be jeopardized if sea otters become established. Save Our Shellfish advocates think introducing otters in Southern California is just inviting future trouble.

“T*he biggest drawback to San Nicolas may be its questionable carrying capacity. Would 300-400 more otter be enough to remove the threat?”*

—Bob Hardy, CDF&G

Carol Fulton, spokeswoman for the Friends, calls the fears of the shellfishing industry “greatly exaggerated.” Urging a San Nicolas translocation, she adds, “Surely it’s not asking too much to reserve one small island of hope for the sea otter.”

Fishermen and the oil industry feel the probability of otter expansion is no more exaggerated than the Friends’ fear that a major oil spill is imminent and would wipe out California’s sea otter herd. Certainly the oil issue inflames an already heated conflict. Says Congressman John Breaux, chairman of the Subcommittee on Fisheries and Wildlife Conservation, “The sea otter is being used as a vehicle to stop oil development. A tanker spill is a greater risk and we must do all we can to prevent that. But why does there have to be a translocation? That’s just moving the problem around.”

Ecological Integrity

USF&WS biologists counter that sea otters are essential to the integrity of the ecosystem. And, they suggest, otters can have positive economic benefits. By removing kelp-grazing sea urchins, otters promote macrocystis kelp growth (the commercially harvested species, reputedly a \$20 million annual industry). By restoring kelp, otters may also enlarge fish stocks available to fishermen.

Other scientists have found that many environmental factors—like storms and pollution—also influence kelp abundance. Bottom topography appears more important than kelp to most fishes. State biologists think the USF&WS scenario oversimplifies immensely complex, still unverified ecological relationships. USF&WS scientists themselves qualify their findings, but sea otter protectionists promote USF&WS arguments as the gospel truth.

“Sea otters make drastic changes to the ecosystem,” says CDF&G’s Bob

Hardy. “But we don’t agree that we need otters to have a healthy balance. ‘Healthy’ is a value judgment. USF&WS focuses its research to make sea otters look good. Its responsibility is to recover otters and that’s being hindered by a part of the public that values shellfish.” He adds, “The biggest drawback to San Nicolas may be its questionable carrying capacity. Would 300-400 more otters be enough to remove the threat?”

“The Channel Islands offer much better habitat than other areas,” asserts Ron Jameson, sea otter biologist for USF&WS. Agency scientists also feel that otters would tend to remain at an island site like San Nicolas. “Evidence indicates that a broad expanse of water acts as a barrier,” Jameson explains. However, sea otters crossed wide

stretches of ocean to recolonize Alaska. They once thrived throughout the Channel Islands. In past translocations, some otters remained nearby, others dispersed. Although USF&WS thinks translocated otters would stay put, given all the variables, shellfishermen and the oil industry fear they won't.

Truth and Compromise

So the arguments continue. Added to the when, where, and if are legal issues which must be settled. For instance, one issue is the containment of otters at a site after translocation, in other words, preventing their dispersal. But no one yet knows how to corral sea otters—without shooting them, a socially unacceptable alternative in California.

And there's still the Optimum Sustainable Population-zonal management question. With gillnet closures, the central coast herd will likely begin migrating again, north and south. Rudy Mangué and other commercial divers are now finding broken shells around Point Conception. San Miguel Island, among the northern Channel Islands, is a one-day otter swim away. Conceivably, while bureaucrats fiddle, sea otters could recolonize the Channel Islands on their own.

Hounded from all sides, USF&WS still has not picked a translocation site; the final decision may rest with the secretary of the interior. The agency hopes to make a go—or no go—determination by the end of 1984, and USF&WS biologists are preparing a draft translocation plan for interested groups to review. "The best anyone can expect is that all the information is laid out on the table," says USF&WS recovery plan coordinator Carl Benz. USF&WS officials hope the affected parties can hammer out a compromise among themselves.

In both California and Alaska, the controversy's key word is compromise. Protectionists think otters' needs should come first, yet there's a tremendous demand for shellfish. Shellfishermen don't deny the otter's place in the ecosystem, they just want reasonable management to preserve their livelihoods—and a valuable food source.

Arguments about overfishing *vs.* otter predation notwithstanding, biologists agree that nearshore commercial shellfisheries and sea otters cannot coexist in the same place. So somebody's going to lose some shellfish. The question remains, who?

by D.B. Pleschner

Sea Otter Range and Potential Translocation Zones

