Seabirds of Hawaii

Natural History and Conservation

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To Mom and Dad

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16 CONSERVATION ON THE ISLANDS

It was my first overnight on Eastern Island, Midway. I would have preferred a bed back on Sand, but it was not safe to navigate a small boat alone on the lagoon after collecting food samples late into the night. The starlit North Pacific sky seemed friendly enough, but I decided to camp in an abandoned bunkhouse to avoid sudden squalls. Well ensconced on a cot after a day of furious physical activity and a few bedtime swallows of zinfandel, I entered a deep and dreamless sleep. Near midnight I awoke with a start. Vaguely aware that a mass of squirming matter had landed between my legs and was surveying my lower body, I reached for my flashlight. The interloper scurried to the floor to join dozens of its rodent brethren. For the rest of that night and on all subsequent trips I slept exposed on the pier and took my chances with the rain. One experience that harrows the soul is enough. But where can a nesting petrel go? Many important Hawaiian seabird colonies have been designated as parks, refuges, natural area reserves, or sanctuaries. Federal, state, and county statutes protect wildlife from human activities with varying degrees of success, but what protects a small bird in its burrow when the hungry rat arrives?

Many of the most blatant forms of abuse to seabirds have stopped. Young albatrosses on Laysan are no longer dipped in boiling water to permit their down to be stripped off. Sooty tern eggs are not collected by the million for sale in the markets of Honolulu, as they are in the Seychelles, nor is subsistence egging a problem, as it is in the Caribbean. Fledgling shearwaters are not canned for sale as mutton birds or processed for pharmaceuticals, as they are in Australia and New Zealand. Modern threats to Hawaiian seabirds tend to be insidious, and protection efforts must respond accordingly.

Threats

Terrestrial threats to seabirds include three broad and overlapping categories: alteration of habitat, disturbance by humans, and the introduction of alien predators, insects, and vegetation.

Alteration of Habitat

The alteration of a species' habitat often eliminates appropriate sites for its nests. Most seabirds colonize only specific locations, and although such species as terns may relocate, biologists do not know how to encourage them to do so. Large portions of Midway, Kure, and French Frigate Shoals have been altered by construction activities. Although the enlargement of Tern and Sand islands created nesting habitats for some species, the vast surface area occupied by roads, housing, and runways removed many nest sites. Midway was proposed as a site for the disposal of nuclear wastes in the 1970s, which no doubt would bring renewed activity and disturbance to an important colony in addition to the more obvious millennia-long problems. Antennas and other structures near nesting grounds interfere with flight. Thousands of Laysan albatrosses, sooty terns, and red-tailed tropicbirds died after collisions with antenna wires on Eastern Island in the mid-1960s. Lights from coastal hotels and street lamps attract and disorient fledgling seabirds on Kauai and other main islands, resulting in death for Newell's shearwaters, dark-rumped petrels, Harcourt's storm-petrels, and wedge-tailed shearwaters. On Oahu, carcasses of dead seabirds are common on both the windward and leeward approaches to the Pali and Likelike tunnels each autumn.

Aircraft frequently collide with birds when airports are constructed near their colonies. Great frigatebirds hang in huge spiraling columns above their colonies and roosting sites, posing hazards to aircraft. Some attempts to control air strikes have resulted in the loss of habitat or reductions in populations. The U.S. Coast Guard crushed more than 30,000 sooty tern eggs on Tern Island in March 1976 in an attempt to drive nesting sooties from the runway. During control programs on Sand Island between 1954 and 1964, tens of thousands of Laysan albatrosses were asphyxiated and much of the nesting habitat near the runways was destroyed. If Laysans continue to establish colonies in the main islands, control efforts near airports may become necessary for public safety.

Disturbance by Humans

Disturbance of colonies during the breeding season can reduce productivity. Eggs and nestlings of surface- and shrub-nesting species become exposed to the sun or to predators when adults are flushed from their nests. Petrels and shearwaters may be trapped or killed when their burrows are crushed underfoot, especially in the Northwestern Hawaiian Islands and Manana, where sandy soil

renders burrows extremely fragile. Uncontrolled visitors to Laysan or Lisianski could cause widespread destruction of nesting burrows and bring steep population declines.

Human disturbance takes many forms. Midway was severely disrupted during World War II, when breeding grounds were used daily and nest sites of all ground- and shrub-nesting species were usurped. Except for an area around the cable compound, virtually the entire surface of Sand and Eastern was smoothed for roads, filled for underground installations, paved for runways, or covered by buildings. Many shearwaters and petrels were killed in their burrows, and those that escaped were actively persecuted when 15,000 soldiers lost sleep because of the birds' nocturnal moaning. Marines and construction men armed with two-by-fours and rods of reinforced steel clubbed thousands of albatrosses to death. Construction and Navy activities on Midway continue to disturb seabirds today, although the Navy seems to be increasingly sensitive to wildlife conservation.

The use of Kaula as a U.S. Navy and Marine Corps bomb target since 1952 has greatly disturbed a potentially important colony. Mere sonic booms can cause sooty terns to desert their colonies, and waves of explosions on nesting islands no doubt have eliminated such sensitive species as blue-gray noddies altogether. Stray bullets from marines at the gunnery range at Ulupa'u Crater in the Kaneohe Marine Corps Air Station sometimes kill red-footed boobies, which are found with bullet wounds in the chest and abdomen. Kahoolawe is used as a naval gunnery site, but except for a few tropicbirds and black noddies, it has few nesting seabirds (Table 5). Probably populations on Kahoolawe would increase if bombing were to stop.

Some unintentional disturbance stems from increasing education, affluence, and experience. Well-meaning tourists and biologists may fail to realize the damage they wreak when they enter sensitive areas. Much of such disturbance is recorded on tourists' film and in the data of biologists, who then draw questionable conclusions about poor breeding success. A single disturbance early in a nesting season may severely affect a booby or frigatebird colony. Parents may abandon nest sites, causing losses of eggs and young from predation, heat exhaustion, cold, or injury. Later in the nesting cycle disturbance may result in starvation of young that become displaced from nests. Sooty or gray-backed tern chicks that are flushed into adjacent territories may be pecked to death by neighbors. Bristle-thighed curlews or Nihoa finches may consume uncovered eggs.

The inaccessibility of most Hawaiian colonies benefits seabirds. Nevertheless, intruders venture even into the remote Northwestern Hawaiian Island colonies. The crew of an unknown U.S. Navy ship landed on Nihoa without permission in the 1960s and left a sign memorializing their visit. In the early 1960s, the Navy engaged in an unauthorized amphibious landing on Pearl and Hermes Reef and left several mementos on Southeast Island: a six-meter observation tower, fifty rusting oil drums, and tracks that persisted for years.

Introduction of Alien Species

The introduction of alien predators, insects, and vegetation to colonies is the most serious long-term threat to Hawaiian seabirds. Aliens may bring severe imbalances in simple island ecosystems. Ten of the eighteen seabirds on Christmas Island nest only on lagoon islets that are free from feral cats. After Mark Rauzon and David Woodside eliminated feral cats from Jarvis Island (a federal wildlife refuge near the equator), populations of seabirds increased dramatically there. Goats introduced on South Trinidad so denuded the island that they eliminated the nesting habitat of a huge colony of red-footed boobies. Shipwrecked pigs on Clipperton reduced vast populations of sooty terns, brown boobies, and the largest colony of masked boobies in the Pacific to a handful of nonbreeders. Dogs, mongooses, pigs, rabbits, and rats pose serious problems for Hawaiian seabirds, especially on the main islands. Dogs hunt down and kill nesting Laysan albatrosses and wedge-tailed shearwaters on Kauai, and feral pigs eat Laysans on Niihau. Mongooses have eliminated ground-nesting birds on Oahu, Hawaii, Maui, and Molokai. Rabbits overgrazed vegetation on Laysan and Lisianski during the early decades of this century, creating desert-like conditions and eliminating most nesting habitat for species that nest in shrubs and bushes.

Norwegian, black, and Polynesian rats have evolved to associate with humans. Norwegian rats arrived in Hawaii by 1838, a few decades before black rats. Polynesian rats probably arrived in the main islands with the Hawaiians some 1,500 years ago, and it seems inescapable that ancient Polynesians once visited Kure and introduced rats there. No island group reached by early Polynesians escaped colonization by Polynesian rats. Norwegian rats weigh about 400 grams; black and Polynesian rats weigh about one-third as much and are far more agile climbers. Wherever Polynesian rats are found, storm-petrels are rare or absent, even though they may be abundant on neighboring ratfree islands.

Rats are a special pest to birds on tropical oceanic islands. Natural predators are absent, there are no inclement seasons to reduce rat populations periodically, and native birds lack innate defenses against such wily interlopers. Rats do most of their work by night and can remove an egg from a nest in seconds. Individual rats may learn to prey on seabirds even when the entire population does not. Petrels are especially vulnerable because the parents leave their defenseless chicks alone in their burrows soon after they have hatched. Whenever a seabird breeding cycle coincides with a peak in rat populations or a low in food supply, rats can wreak havoc on a colony. George C. Munro recognized in 1945 the problems that rats could cause on Midway:

> A program of rodent control has been undertaken at Midway but unless rats are exterminated the Bonin petrel will be affected, Bulwer's petrels entirely killed out on the islands and the lovely white terns seriously endangered.

He was right about the first two.

Rats can do considerable damage to a colony even if each rat consumes only a

few eggs a year. Because they are agile, rats can exploit a wider range of seabirds than other predators. They enter crevices and burrows in search of eggs or young, destroy nests on the ground, and may even raid cliff sites. Rats today occupy all main islands and many offshore islets, including Popoi'a, Moku'auia, and Mokoli'i. In the Northwestern Hawaiians, rats so far are restricted to Midway and Kure, where populations can reach one hundred per acre. The next introduction is merely a human error away. Refuge manager Eugene Kridler found rat poison on the wreck of a Japanese fishing vessel that broke up on the reef at Laysan in 1969. After the fishermen were rescued, they swore that no rats were aboard. Whatever the truth was, none got ashore.

Mongooses are weasel-shaped carnivores that undoubtedly have severely restricted the range of all ground-nesting birds on Oahu, Maui, Molokai, and Hawaii during the past century. They range inland up to at least 2,500 meters, so that only the highest reaches of Maui and Hawaii potentially escape their carnage. The introduction of mongooses to Kauai could have devastating effects on Newell's shearwaters. It is probably hopeless to attempt to exterminate an established mongoose population on a main island.

Introduced insects bring new diseases to isolated bird populations that have developed few immunities. Mosquitos are vectors of avian pox and malaria. An exotic mosquito on Midway is implicated in the transmission of pox, a viral disease that causes extensive facial lesions and death in albatross and red-tailed tropicbird nestlings. Pox has even cropped up on Newell's shearwaters on Kauai, probably transmitted by mosquitos from alien birds. Avian malaria, introduced to Hawaii around 1900, contributed to the demise of many endemic birds, possibly including seabirds, in the main islands. Because most declines of native bird populations occurred before the turn of the twentieth century, rats and mongooses are probably the primary culprits. Exotic insects also indirectly affect seabirds by reducing nesting habitat. Alien scales have infested and weakened Lisianski's beach magnolia, which may now be more likely to die during winter storms or drought. Many stands of beach magnolia have died off on Laysan, allowing sand movements that destabilize burrows and shrubs.

Alien vegetation may eliminate nesting habitat for ground-nesting species. Golden crown-beard, a hardy tall annual, is spreading over the central plain at Kure and eliminating breeding habitat for Laysan albatrosses and masked boobies. Other aggressive exotics on Eastern Island, Midway, have diminished open areas where masked boobies, sooty terns, and other species nest. An alien sunflower (*Bidens alba*) is common in disturbed areas of Sand Island, Midway, and provides habitat for the mosquitos that spread avian pox. Many Laysan albatrosses that nest near the sunflower stands contract pox.

Federal Laws and Policies

Governments have the resources to own and manage large tracts of important wildlife habitat. They also have the means by which to regulate the use of land

they do not own provided such regulation is reasonably related to public health, safety, or promotion of the general welfare. It is inescapable that an important way to protect seabirds ashore is to acquire and manage the land they utilize. It is also expensive. The ownership of key development rights and the regulation of land use are cheaper means to the same end. The Nature Conservancy's leasing of 218 acres of Newell's shearwater nesting habitat at Kaluahonu Preserve, Kauai, indicates that conservation and management of seabird colonies are not the exclusive domain of government agencies.

Many federal laws protect Hawaiian seabirds. Since the 1960s many federal statutes have sought to ensure that wildlife conservation is considered in the federal planning process; the most important statutes are discussed here. Others, such as the Clean Air Act, the Clear Water Act (which provides for the protection of wetlands), the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), and the Resource Conservation and Recovery Act, also are potentially important tools in wildlife conservation.

Federal Lands

The federal government manages seabird colonies in Hawaii in national parks and national wildlife refuges and on military bases. The federal government owns about one-tenth of the land in Hawaii, a proportion considerably smaller than in other western states. Neither the U.S. Forest Service nor the Bureau of Land Management manages any land in Hawaii. Parks are special-purpose lands, and accordingly are far less susceptible to disruption by commercial development than multiple-use lands. National park status provides the maximum protection available under federal ownership. The National Park Service Act provides that parks are to conserve wildlife to leave it "unimpaired for the enjoyment of future generations."[1] In addition, federal courts have held that the secretary of the interior has a public trust duty to protect park resources. Haleakala National Park contains most of the known dark-rumped petrel nest sites in Hawaii. The National Park Service has sponsored studies of the biology of dark-rumped petrels and has engaged in programs to protect their nest sites from predators.

The paramount federal agency for seabirds is the U.S. Fish and Wildlife Service. It manages the Hawaiian Islands National Wildlife Refuge, which includes the Northwestern Hawaiian Islands and Kilauea Point. The National Wildlife Refuge System is the only extensive system of federally owned lands that is managed chiefly for the conservation of wildlife. As multiple-use lands, however, refuges are a far cry from the inviolate sanctuaries they were originally conceived to be. The National Wildlife Refuge System Administration Act restricts the transfer, exchange, or other disposal of refuge lands.[2] The authority

[1] 16 U.S.C. § 1 (1988).
[2] 16 U.S.C. § 668dd (1988).

of the secretary of the interior to exchange lands remains unclear, but a federal court in Alaska rejected Secretary James Watt's attempt to exchange St. Matthew Island, a pristine seabird colony in the Bering Sea, for waterfowl habitat in the Yukon delta in order to allow the Atlantic Richfield Company to use St. Matthew to develop submerged oil and gas fields nearby.[3]

A refuge may be used for any activity that is compatible with the major purposes for which it was established. Unlike national parks, refuge units have rarely been designated by statute, and consequently it may be unclear why an individual refuge was established. This problem has been solved for the Hawaiian Islands National Wildlife Refuge by the development of a master plan that sets forth its goals and objectives.[4] One fundamental goal is the protection and enhancement of seabirds. Access to the fragile Northwestern Hawaiian Islands is restricted through a special-use permit system that requires approval in writing before any monitoring or research project may be undertaken.

The Hawaiian Islands National Wildlife Refuge has been under formal consideration for wilderness designation since 1969, but Congress has yet to make a decision. The U.S. Fish and Wildlife Service applies wilderness management procedures to the refuge pending Congress's decision, so that commercial activities and permanent installations are prohibited there. Seven of the large islands and atolls were designated research natural areas in 1967; the designation requires the preservation of their natural features and processes and restricts intervention to activities connected with research and education. Refuge managers have substantial discretion and authority to provide conditional-use permits for a wide variety of activities at Hawaiian refuges. It would be naive to believe that such discretion is not influenced by the prevailing political climate in the agency, in terms both of national politics and, more important, of the personalities of the current refuge managers.

The Kaneohe Marine Corps Air Station, Oahu, and Midway Naval Air Facility contain important seabird colonies. Both the Marine Corps and the Navy have elected under the Sikes Act Extension[5] to enter into cooperative agreements with the U.S. Fish and Wildlife Service and the Hawaii Department of Land and Natural Resources to carry out programs for the conservation and protection of seabirds on their bases. The U.S. Fish and Wildlife Service proposed to manage Midway as an overlay refuge in the 1970s, and in 1988 the Navy finally agreed to such an arrangement. Johnston Atoll has a similar overlay refuge status and is principally managed by the Defense Nuclear Agency. Conservation programs on military bases are always subject to the ill-defined and essentially unappealable doctrine of national security, which base commanders sometimes invoke as a means to preclude civilian scrutiny of potentially controversial activities.

[3]National Audubon Society v. Hodel, 606 F. Supp. 825 (D. Alaska 1984).

[4]U.S. Fish and Wildlife Service, *Hawaiian Islands National Wildlife Refuge Master Plan*, FES no. 86/11 (Washington, D.C., 1986).

[5]16 U.S.C. § 670a (1988).

National Environmental Policy Act

Effective wildlife conservation requires more than the acquisition of habitat and the regulation of hunting. The National Environmental Policy Act is an important statute for Hawaii's wildlife even though it mentions neither wildlife nor seabirds.[6] It ensures that each federal agency will consider the environmental impacts of its proposed actions before becoming committed to them. The effect is primarily procedural. The Supreme Court of the United States has ruled that the National Environmental Policy Act "merely prohibits uninformed—rather than unwise—agency action."[7] A court cannot substitute its judgment for that of an agency and generally defers to it when the agency has more expertise on the subject at issue than the court. A "hard look" standard of review is sometimes evoked: a court determines whether the agency took a hard look at the alternatives before reaching its decision. If an agency fails to identify the source of its facts and justify its decisions, or considers factors that it is forbidden to consider, a court does not hesitate to set the decision aside as arbitrary, capricious, or an abuse of discretion. A federal agency's interpretation of a statute that it has been entrusted to administer is given additional weight if Congress has left gaps in the statutory scheme for the agency to fill.[8]

The National Environmental Policy Act sets forth a policy to "promote efforts which will prevent or eliminate damage to the environment and the biosphere." Its critical provision is the requirement that a detailed environmental impact statement be prepared for every major federal action that significantly affects the quality of the human environment. The statement must take a systematic, interdisciplinary approach to problem solving and discuss the possible adverse effects of proposed actions and any reasonable alternatives. Alternatives to proposed actions must be included and any irrevocable commitments of resources, such as the use of wildlife habitat, must be identified.

The National Environmental Policy Act has enlarged the authority of nonresource agencies, including the Department of Defense, to encompass environmental protection. It requires resource agencies such as the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to review the environmental decisions of other federal agencies. One hidden benefit has been the elimination of the worst projects (such projects are no longer formally proposed) and the omission of objectionable portions of others, which are changed during the planning process to mitigate adverse environmental consequences. Its notice requirements allow interested citizens and organizations to comment on draft environmental impact statements, thereby allowing wide participation and increased expertise in planning. In many cases the need to prepare an environmental impact statement brings individuals and organizations together for cosponsorship to achieve a consensus in regard to priorities.

[6] 42 U.S.C. §§ 4321–47 (1988).
[7] Robertson v. Methow Valley Citizens Council, 57 U.S.L.W. 4497, 4502 (1989).
[8] Chevron U.S.A., Inc. v. Natural Resources Defense Council, 467 U.S. 837 (1984).

Any major federal action that might have a detrimental effect on a seabird colony would be scrutinized in an environmental impact statement. Conservationists and biologists would have an opportunity to propose alternatives that might mitigate or eliminate damage or to persuade an agency to abandon the project. Environmental impact statements are required for ongoing programs as well as for specific projects. The U.S. Fish and Wildlife Service prepared a statement for the Operation of the National Wildlife Refuge System in 1976 and planned to update it by 1991. By its nature the National Environmental Policy Act provides some judicial review and public intervention in the administration of wildlife programs.

A major failing of the National Environmental Policy Act is an absence of any requirement to prepare retrospective evaluations of past environmental impact statements to compare predicted with actual consequences. Although some agencies might be embarrassed by the revelation of past errors, the information obtained would vastly improve predictive techniques for future projects.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act was the first federal attempt to limit the killing or taking of migratory birds.[9] Although the impetus for its passage was the desire to solve problems with such species as ducks and geese, it established a year-round "close season" for all migratory birds except game birds. Seabirds and their nests and eggs cannot be taken, killed, or sold without a permit. The Migratory Bird Treaty Act implements treaties with Great Britain (on behalf of Canada), Mexico, Japan, and the USSR and requires the secretary of the interior to protect the birds listed in the four conventions. By regulation, all of the twenty-two species of seabirds that nest in Hawaii are protected, notwithstanding the fact that several are nonmigratory in the strict biological sense.[10] The treaty with Japan is unusual in requiring protection of the ecological balance of unique island environments. The U.S.–Soviet treaty prohibits the "disturbance of nesting colonies" and directs both nations to establish and manage preserves. Despite such provisions in the recent treaties with Japan and the USSR, the Migratory Bird Treaty Act remains very similar to the original 1918 act and has not been amended to include the additional features. Whether the treaties are self-executing and thus do not require implementing domestic legislation is an open question.

The U.S. Fish and Wildlife Service administers the Migratory Bird Treaty Act on both private and public land. Scientists who wish to collect seabirds as part of a research program must first obtain a permit. Because "taking" is broadly defined by regulation, the agency has fairly wide authority to protect seabirds; the regulation should, among other things, prohibit disturbance to breeding

[9] 16 U.S.C. §§ 703–12 (1988).
[10] 50 C.F.R. § 10.13 (1989).

colonies and accidental killing by pesticide sprays.[11] Hawaii is administered by the U.S. Fish and Wildlife Service's regional office in Portland, Oregon. Because the region encompasses six states, including California, Hawaii's problems are often lost in the shuffle. The regional office has established a marine bird policy for all refuges, which includes the goals of maintaining the population levels of all marine birds and removing all introduced predators from their colonies.

Endangered Species Act

The Endangered Species Act provides a powerful weapon to protect species that the federal government has designated as endangered or threatened.[12] All federal agencies, not just those whose mandate is conservation, must carry out programs to conserve listed species. Loss of habitat is the root cause of the endangered status of most island-dwelling creatures, and many activities that cause such losses are directly undertaken or indirectly authorized by federal agencies. Such activities fall within the ambit of the statute. Although the Endangered Species Act also provides for the designation of critical habitat (areas essential to the conservation of a species), critical habitat has not been designated for any Hawaiian seabird. Dark-rumped petrels and short-tailed albatrosses are listed as endangered species[13] because they are in danger of extinction throughout all or a significant portion of their ranges. Newell's shearwaters are listed as threatened because they are likely to become endangered within the foreseeable future. As a threatened species, Newell's could be protected by "regulations that are necessary and advisable" to provide for their conservation, but no such regulations have been issued. Region One of the U.S. Fish and Wildlife Service has informally designated sooty storm-petrels as a sensitive species and monitors their status for possible protection under the Endangered Species Act. The U.S. Fish and Wildlife Service has issued a recovery plan for dark-rumped shearwaters and Newell's shearwaters, but unfortunately it was not accompanied by an environmental impact statement.[14]

Dark-rumps and short-tails are fully protected by the act and cannot be sold or taken. The statute broadly defines "taking" to encompass harassment, harm, pursuit, capture, collection, shooting, and killing. Just as important, the regulations define "harm" to include significant modification or degradation of habitat. As the State of Hawaii has twice learned to its chagrin in *Palila* v. *Department of Land and Natural Resources*, state actions that degrade the feeding, roosting, or nesting habitat of an endangered species can be enjoined by a federal court.[15] The Endangered Species Act allows taking if it is incidental to the

[11] 50 C.F.R. § 10.12 (1989).

[12] 16 U.S.C. §§ 1531–44 (1988).

[13] 50 C.F.R. § 17.11 (1989).

[14] U.S. Fish and Wildlife Service, *Hawaiian Dark-Rumped Petrel and Newell's Shearwater Recovery Plan* (Portland, Ore., 1983).

[15] Palila v. Hawaii Department of Land and Natural Resources [DLNR], 471 F. Supp. 985 (D. Hawaii 1979), *aff'd*, 639 F.2d 495 (9th Cir. 1981); Palila v. DLNR, 649 F. Supp. 1070 (D. Hawaii 1986), *aff'd*, 852 F.2d 1106 (9th Cir. 1988).

carrying out of an otherwise lawful activity such as forestry, clearing land, or fishing. However, no incidental take permit may be issued without the submission of a conservation plan, which must include means to mitigate the harm caused by the taking of an endangered species.

There is a great deal of confusion concerning the importance of designating critical habitat. The designation has operative significance under the Endangered Species Act only through a process by which each federal agency consults with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to ensure that any action the agency authorizes, funds, or carries out does not jeopardize the continued existence of any endangered or threatened species or result in the destruction of critical habitat. Because the destruction of critical habitat would necessarily place any endangered species in jeopardy, the formal designation of critical habitat does not seem to have profound legal significance; yet it has practical significance. Critical habitat identifies for agencies, judges, and corporate executives the precise locations where activities will definitely run afoul of the Endangered Species Act. The location of a new highway, airport, or military installation is much more likely to be changed at an early stage in the planning process, before large resources have been committed to a particular plan, when the proposed site has been designated a critical habitat. The statute is so broadly construed that even federal loan guarantees may trigger the process of consultation with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. If either agency issues a biological opinion that a proposed action jeopardizes an endangered or threatened species, the sponsoring agency must adopt reasonable and prudent alternatives to avoid the adverse effects.

Most of the known dark-rump nests in Hawaii are located within Haleakala National Park, Maui. Though it is unlikely that the National Park Service would allow activities that would directly jeopardize the dark-rumps' nesting habitat, the Endangered Species Act requires extensive review and public comment if such actions should be proposed. It also allows citizens' suits to compel the agency to comply with the statute's requirements. Short-tails come ashore occasionally on federal lands in the Northwestern Hawaiian Islands but probably do not face any immediate threats except possibly harassment on Midway. Newell's shearwater nests in the mountains of Kauai are threatened primarily by introduced predators that need no permit to enter a Newell's colony. Hence the Endangered Species Act has limited value on land to Hawaiian seabirds today. If new dark-rumped nest sites were discovered, however, the act's critical habitat provisions could be employed to provide additional protection.

State of Hawaii Laws and Policies

Seabirds are potentially protected by a wide variety of Hawaii statutes, many of which roughly parallel those of the federal government. The State of Hawaii also exerts powerful control of land development through its land use planning

statutes, which, when properly applied, provide substantial protection to all wildlife. Some of the most pertinent of the many state statutes and policies are considered here.

State Lands

The state is the largest landowner in Hawaii, holding over a third of the land. The federal government turned over most of its land to Hawaii when it became a state in 1959, retaining primarily military land, the national parks, and the refuges. The state is responsible for seabird colonies in wildlife sanctuaries and forest reserves. None of its seventy-four parks or eighteen natural area reserves (communities of natural flora and fauna) is known to contain a seabird colony. However, Ka'ena Point Natural Area Reserve on Oahu has roosting Laysan albatrosses that need protection, and dark-rumped petrels may nest in the Hono O Na Pali Natural Area Reserve on Kauai. Over the objections of some local fishermen, the Board of Land and Natural Resources has designated thirty-nine islets, islands, and rocks as the Hawaii State Seabird Sanctuary to conserve, manage, and protect seabirds.[16] It is prohibited to remove, disturb, injure, kill, or possess any seabird at any sanctuary. The Department of Land and Natural Resources does not generally restrict access to the sanctuary, but a permit is required for Moku Manu, Manana, Mokuho'oniki, and Kure.

The state manages vast amounts of forest reserves in the mountainous interiors of the main islands. Within these holdings are colonies of Newell's shearwaters, Harcourt's storm-petrels, white-tailed tropicbirds, and dark-rumped petrels. Owing in part to difficulties in obtaining access and consequent lack of knowledge, the Department of Land and Natural Resources does little if any active seabird management in its forest reserves.

Statewide Land Use Planning

The State of Hawaii intensely regulates the use of land and has the most comprehensive land use controls in the United States. Unlike any other state, Hawaii has enacted its plan as a statute.[17] Among the state plan's many objectives are the exercise of an overall conservation ethic in the use of Hawaii's natural resources and effective protection of Hawaii's unique and fragile environmental resources. The state plan provides broad guidelines for state activity, but its use is limited because it also contains a long list of economic and development goals that inherently conflict with environmental goals without providing any means of reconciliation.

The Hawaii Land Use Act zones all public and private land in the state into

[16]Title 13, DLNR, subtitle 5, Forestry and Wildlife; pt. 2, chap. 125 (Sanctuaries) (September 23, 1981).

[17]Hawaii Rev. Stat. § 226 (1985).

four land use districts: urban, rural, agricultural, and conservation.[18] Land can be reclassified by application to the Land Use Commission, but any reclassification must conform to the state plan. Conservation land is further classified into four subzones of descending degrees of protection: protective, limited, resource, and general. The six-member Board of Land and Natural Resources has general powers to oversee all land held by the state and specific authority to grant or deny applications for the use of conservation land, which accounts for almost half of the state's land. The members of this powerful board are appointed by the governor primarily on the basis of political connections rather than any expertise in the management of natural resources.

Following the enactment by Congress of the Coastal Zone Management Act[19] of 1972, Hawaii adopted the Hawaii Coastal Zone Management Act[20] as a comprehensive regulatory scheme to protect the environment and resources of Hawaii's coastal areas. Land along the coast has faced and continues to face the most intensive development pressures. The state's declared policy is to preserve, protect, and, where possible, restore the natural resources of Hawaii's coastal zone. Most seabird colonies are located in the coastal zone and fall within the ambit of the statute's protections.

The implementation of the Hawaii Coastal Zone Management Act is delegated largely to the four counties that administer the procedures governing the issuance of permits to develop land within "special management areas," defined as the first hundred yards landward of the shoreline. The counties are required to designate as special management areas locations that require extraordinary protection, including essential habitat for wildlife, on county maps. No major development may be approved within a special management area unless the county finds it will have no substantial adverse environmental or ecological effect, except when such adverse effects are clearly outweighed by considerations of public health and safety. A permit to use a special management area may not be granted unless a public hearing is held at which interested individuals may testify. It seems unlikely that any county could find that a proposed development would cause no substantial adverse environmental effect if it imperiled one of the few remaining seabird colonies in the main islands. The Hawaii Coastal Zone Management Act grants broad standing to any person to challenge in court a county's findings or its compliance with the statute's objectives.

The City and County of Honolulu, in which many of Hawaii's coastal seabird colonies are located, has prepared a development plan for the Northwestern Hawaiian Islands and the islands of windward Oahu. It seeks to preserve and protect the environment and wildlife of those islands, emphasizing protection of the resources together with controlled use for educational, research, and

[18]Ibid., § 205.
[19]16 U.S.C. §§ 1451–64 (1988).
[20]Hawaii Rev. Stat. § 205A (1985).

recreational purposes. There would be extensive input by the public and oversight by the City Council before any special management area permit could be issued for a proposed development at any seabird colony. As a practical matter, the land use control laws in Hawaii make it extremely difficult for detrimental projects at coastal seabird colonies to be approved.

Hawaii Environmental Policy Act

The Hawaii Environmental Policy Act generally parallels its federal counterpart and addresses major activities that have state but no federal involvement. Proposed actions that fall within its scope include the use of state and county lands and funds, and any action that requires a permit for the use of a special management area or conservation district.[21] The responsible agency for such actions must at a minimum prepare an environmental assessment to determine whether a full-blown statement is necessary. An environmental impact statement is required for actions that would have a significant effect on the environment, including those that are contrary to Hawaii's environmental policies or would irrevocably commit natural resources. No project may go forward until the statement has been accepted.

Whenever a statement is required under both federal and state environmental policy acts, federal and state agencies cooperate to reduce duplication and frequently issue joint statements. Like the federal statute, the Hawaii Environmental Policy Act is primarily procedural, and its chief virtue is the public examination of the adverse environmental effects of proposed projects. It cannot by itself prevent the state government from undertaking an environmentally disastrous project, but it can be used to halt a project for procedural irregularities. Any state project that would directly harm a seabird colony would probably require an environmental impact statement. Interested individuals, organizations, and agencies would have an opportunity to suggest ways to mitigate the project's worst effects or oppose its approval altogether.

Hawaii Wildlife Protection Statutes and Policies

The State of Hawaii has enacted a variety of statutes to protect all wildlife. The legislature has declared that all indigenous wildlife is an integral part of Hawaii's native ecosystems and is part of the living heritage of Hawaii. It is unlawful for any person to take, possess, sell, or transport any nondomesticated member of the animal kingdom except pursuant to regulations issued by the Department of Land and Natural Resources. By regulation, the department may issue permits only for scientific or educational purposes for which collecting is essential.

The Hawaii Endangered Species Act provides some additional protection to

[21]Hawaii Rev. Stat. § 343 (1985).

any species listed as endangered or threatened by its federal counterpart or any indigenous species that the Department of Land and Natural Resources has listed because its continued existence is jeopardized by destruction of habitat, disease, or similar factors.[22] In addition to the seabirds that the federal government has listed as endangered or threatened, the department has designated as endangered white terns on Oahu and Harcourt's storm-petrels throughout their range in Hawaii. The Hawaii statute focuses exclusively on prohibiting the direct taking of endangered species. It lacks provisions to protect habitat or to command state agencies other than the Department of Land and Natural Resources to conserve and protect endangered or threatened species. Hence it is simpler and far less useful than the federal act.

The Department of Land and Natural Resources set forth its seabird policies in its 1984 wildlife plan.[23] The plan assigns its highest priority to endangered and threatened seabirds and species that are important to the fishing industry. The department seeks to remove or control the factors that limit the survival of threatened and endangered seabirds. Although the plan suggests that all seabird colonies be monitored at least once each year, the department has never done a single survey on many of the islands in the state seabird sanctuary. The plan also advocates the removal of rodents from seabird sanctuaries and encourages human use except where visitors are detrimental to seabirds or their habitats.

Efficacy

How well do the laws work? Statutes that establish preserves and outlaw taking have aided the remarkable recovery of populations that seemed destined for extinction not so many decades ago. Yet the mere designation of sanctuaries and control of direct use of seabirds leaves many important terrestrial conservation problems unaddressed. Few Hawaiian seabirds today are intentionally killed, and no commercial enterprise consumes any part of a seabird.

The key to any statutory framework that protects wildlife is enforcement. Here the record is all too often poor. The Northwestern Hawaiian Islands are difficult to patrol and seem almost as remote today as they were at the turn of the twentieth century. Fortunately the isolation that hampers enforcement also protects the wildlife. Less understandable is the poor enforcement at the state seabird sanctuary. A single patrol boat could effectively monitor visitors to the colonies offshore Oahu, and occasional inspections at islets offshore Kauai, Maui, Molokai, Lanai, and Hawaii are warranted. The costs of such patrols would not be large. Their absence is a result of the general inattention of the Department of Land and Natural Resources to the conservation of marine resources.

[22]Ibid., § 195D.

[23]State of Hawaii, Department of Land and Natural Resources, *Hawaii Wildlife Plan* (Honolulu, 1984).

The destruction of nesting habitat is a major threat to Hawaiian seabirds, and current laws and policies are mixed in this regard. State and federal agencies have been successful in designating large and conspicuous seabird colonies as parks, refuges, or sanctuaries. Undoubtedly small colonies in the forested mountains of the outer islands need similar protection from logging, grazing, agriculture, and other human activities, but they have not been located. Where passive management is sufficient, seabirds are protected. Many colonies, however, need intense and active management programs to control or eliminate mongooses, rats, and dogs. The elimination of rats from seabird colonies, especially the islands offshore Oahu, has received insufficient attention.

Agency wildlife programs are only as strong as their funding. They vary with the interests of the personnel involved, especially on military bases, where programs may change radically to accommodate the interests of an individual base commander. Committed individuals who work in the wildlife agencies cannot be faulted for the low funding levels and inadequate staffing that hamper their best efforts. In an era when the federal government is generally cutting back its services, the state has not signaled any clear intention to pick up the slack. The *Hawaii Wildlife Plan* is an eloquent statement of policy, yet like so many state statutes, plans, and policies, it is poorly implemented. It includes no funding levels and no dates by which the Department of Land and Natural Resources must reach its stated goals. No wonder that progress in meeting its goals is limited.