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# New defenders of wildlife

*Practicing conservation and protecting habitat are not usually considered parts of the military's job description*

James Bailey stands on the banks of Romney Creek, a broad but short tidal stream that flows through the US Army's Aberdeen Proving Ground and into the Chesapeake Bay north of Baltimore. Here, on a sunny fall day, an eastern deciduous forest sheds its autumn leaves quietly not far from a site where Army engineers test weapons, munitions, and other military equipment.

A short distance upstream, some 30–40 roosting bald eagles eye the water for signs of fish. Downstream, great mounds of dried guano on Pooles Island in the Chesapeake Bay attest to the 600 pairs of great blue herons that nested there over the summer. At a nearby pond, some 2000 ducks and other migrating waterfowl rest on cool fall nights.

"If we weren't here, this land would be all marinas and condominiums," says Bailey, an Army wildlife biologist at Aberdeen. Instead, Aberdeen's 79,000 acres hold a healthy deer herd, beaver ponds, turkey vultures and black vultures, red-tailed and marsh hawks, and the largest bald eagle population on the northern Chesapeake. "We are a de facto wildlife sanctuary," Bailey says.

When one thinks of natural lands with abundant wildlife, protected endangered species and research opportunities, images of national parks, wildlife refuges, and other preserves usually come to mind. One rarely thinks of military bases, like Aberdeen.

Yet, the US Department of Defense (DOD) manages more than 25

million acres of land nationwide. Among government agencies, that amount of area is second only to the Department of the Interior. Within that department, the Bureau of Land Management holds 270 million acres, the US Fish and Wildlife Service (USFWS) has 92 million acres of national wildlife refuges, and the National Park Service has 83 million acres of national parks.

Some DOD facilities encompass more land than most national parks or wildlife refuges. Eglin Air Force Base near Pensacola, Florida, for example, totals 464,000 acres. The Naval Air Weapons Station at China Lake, California, has 1.1 million acres, and the Army's White Sands Missile Range in New Mexico 2.2 million acres. The latter is equal in size to Yellowstone National Park in Wyoming, the largest park in the continental United States.

"We've got more endangered species per acre than any other federal land management agency," says Philip Pierce, an Army natural resources officer in Arlington, Virginia. "Our bases are islands of protected species. They probably hold more species today than when we acquired them."

The reason: Most land on military bases remains largely natural. More than 90% of the 850,000 acres at the Army's Yuma Proving Grounds in southwestern Arizona is undeveloped. At Avon Park, Florida, the Air Force uses only 3000 acres of a 106,000-acre base and bombing range south of Lake Kissimmee. And, at Fort Sill in Lawton, Oklahoma, where the Army artillery trains, 86,000 of the base's 94,000 acres are wild.

Large expanses of land are needed

as safety or security zones, says Lieutenant Colonel Tom Lillie, an Air Force program manager for natural and cultural resources at the Pentagon. They are also needed, the Army's Pierce adds, to train troops in environments similar to those US forces might face in future wars.

## Limiting access on bases

Not only is land preserved on military bases, but public access is often limited. "Military installations are not national parks or zoos," says Junior Kerns, a wildlife biologist at the Yuma Proving Ground. "We can close off areas without going through public hearings."

Military personnel may also be prohibited from entering environmentally sensitive areas on bases. At Camp Pendleton, the Marine Corps' amphibious warfare training center halfway between Los Angeles and San Diego, a sign warns people to keep out of a particular beach "by order of the base commander." One-fifth of all California least terns, an endangered subspecies, nest from May to August at Pendleton along the coastal estuary where the Santa Margarita River flows into the Pacific Ocean. The sign is obeyed because "marines are used to taking orders," explains Slader Buck, natural resources manager at Pendleton.

On the other hand, natural does not mean unused, especially where ground troops operate. "All of our land may be used for training," Buck says of Pendleton's 126,000 acres, the last large reservoir of California chaparral and coastal scrub between Mexico and Los Angeles. "That's our mission. We're not a national park. It's not vacant land to us."

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by Jeffrey P. Cohn

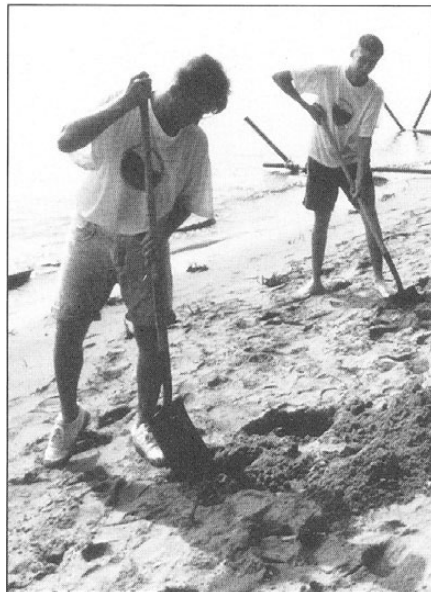
Nor does natural, in most cases, mean pristine. Some bases, like the Army's Fort Benning near Columbus, Georgia, were once heavily logged. Others, like the Rocky Mountain Arsenal near Denver, now a thriving national wildlife refuge, contain leftover chemical wastes and toxic pollutants. Elsewhere, troops conduct training maneuvers, drive tanks and other heavy vehicles over the ground, fire live artillery shells, and drop bombs.

Still, large, mostly natural lands with restricted human access and abundant wildlife in a variety of habitats from coast to coast provide diverse opportunities not only for wildlife conservation, but also research. "Our military bases are natural laboratories," says the Army's Kerns, president of the National Military Fish and Wildlife Association, a group for DOD wildlife biologists.

For years, the only DOD money available for wildlife conservation and research came from selling logging, farming, or grazing rights on military lands. The Sikes Act of 1960 extended that concept by authorizing DOD to collect fees for hunting and fishing on military bases. The act also required DOD to cooperate with USFWS and state wildlife agencies.

In 1991, Congress created the Legacy Resource Management Program. Until recently, the legacy program provided \$50 million a year to fund projects aimed at managing wildlife and other natural, anthropological, or cultural resources on military lands. It had been viewed as a "godsend," Kerns says, because it provided money that was specifically targeted to wildlife research. (At press time, the program was facing budget cuts from Congress of 80%.)

Even with funding for research and conservation programs, DOD has sometimes had problems with managing natural resources. In 1992, three civilian Army employees at Fort Benning were charged with conspiracy to violate the En-



Beach planning at Spesutie Island. Photo: US Army, Aberdeen Proving Ground.

dangered Species Act, a felony. They had designated some of the base's extensive pine forests for clear-cut logging, including habitat for the endangered red-cockaded woodpecker.

Under the terms of a pretrial agreement, two of the employees were fined. One was reassigned to other duties, and the other retired. Charges against the third were dropped. Although the Fort Benning case involved civilians, it "sent a message through the military [that] this is not the way to do business," says Philip Laumeyer, a field supervisor in the USFWS's Brunswick, Georgia office.

Another case involved the commander and another officer at Fort Monroe in Hampton, Virginia. They were officially reprimanded in 1994 for ordering base workers to destroy yellow-crowned night heron nests. The birds were not harmed, but their nests were knocked down because heron droppings defiled lawns, roads, and cars. The birds are not endangered, but they are protected under the Migratory Bird Treaty Act.

Beyond civil penalties, such reprimands can affect an officer's military standing. "It could end a career, especially during times of downsizing," Kerns says. "Officers can't afford even a hint of blemish on their record."

Most military personnel now seem

to understand the need to obey wildlife laws. "We hammer home the message that you need to consult with us," says Tom Campbell, a biologist at the Navy's China Lake weapons station. "Some don't like it, but they have bit the bullet. We have the commander's support, so people pay attention."

## Navy changes practices

The attention shows in conservation and research projects on military bases from coast to coast and sometimes beyond. For starters, the Navy redesigned its tugboats and other small craft. The change came after a female manatee and her calf were killed by a ship's propellers at the Navy's submarine base at Kings Bay, Georgia. The new design adds metal shields to prevent the manatees from being drawn into ship propellers. No manatee is known to have been killed by propellers since the Navy made its changes.

The Navy's conservation efforts at Kings Bay extend into the Atlantic Ocean. Navy biologists are working with the Coast Guard and federal and state wildlife agencies to protect a right whale calving area off the Georgia and Florida coasts. Navy biologists survey the whales and monitor their movements. The information is then fed to local shippers and recreational boaters to help them avoid collisions at sea.

## Habitat conservation is underway

Habitat conservation and restoration has become a major focus at other military bases as well. At Barksdale Air Force Base in Shreveport, Louisiana, for example, base land managers built controls and a pump on existing canals to reflood drained wetlands along the Red River. The result: Approximately 2000 acres of recreated wetlands now attract 6000 nesting white ibises, little blue herons, and other wading birds to an area that had few

if any before.

Some 2300 miles away, the Navy protects 225 acres of old-growth forest at the Jim Creek Radio Station north of Seattle. The area, a key communications link between naval shore commands and US submarines at sea, holds one of the Pacific Northwest's last stands of virgin Sitka spruce, Douglas fir, cedar, and western hemlock.

Yet other large trees are the focus of a habitat restoration project at Dare County Air Force Bombing Range in North Carolina. Forester Scott Smith has planted Atlantic white cedar trees on a 15-acre test plot in an attempt to reestablish the species. Only 10% of Atlantic white cedar habitat, which once stretched along the coast from New Jersey to Louisiana, remains. Smith hopes eventually to restore 5000 acres, including 2000 acres of white cedar, on formerly clear-cut land at the Dare County range.

Elsewhere, near Lawton, Oklahoma, the Army has set aside 2000 acres around an artillery firing range at Fort Sill. The protected area contains the largest chunk of ungrazed tall-grass prairie in the West, says James Gallagher, an Army wildlife biologist. The preserve provides habitat for white-tailed deer, scissor-tailed flycatchers, and the largest wintering population of northern harriers in the United States.

Habitat protection is particularly difficult at Fort Sill and at Fort Knox, the Army's tank headquarters, south of Louisville, Kentucky. At both bases, heavy tanks, howitzers, rocket launchers, and other vehicles chew up the ground, dig deep ruts, and add to soil erosion. At Fort Knox, where forests rather than prairies prevail, the heavy equipment and weapons also bowl over trees and bushes.

The Army has launched active land-restoration programs at both sites. Bulldozer crews have restored natural contours on 1000 acres at Fort Knox since 1991, says Albert Freeland, the base's chief environ-

mental manager. Ditches, some eight feet deep, have been filled, and trees and other native vegetation have been planted.

### Working with individual species

Besides protecting and restoring habitat, DOD biologists also are concentrating on individual species. For instance, the Navy is recreating habitat for the endangered red-cockaded woodpecker at the Naval Weapons Station at Charleston, South Carolina. The small black-and-white birds, named for the males' red head tufts, usually nest in cavities in the trunks of mature pine trees. However, the birds have disappeared from large areas in the southeastern United States because pine forests have been heavily logged.

Navy biologists have affixed 16 nest boxes, modified to keep other birds away, to pine trees. The boxes replaced tree cavities lost when mature pines were destroyed during Hurricane Hugo in 1989. The biologists also have drilled holes in trees to give the woodpeckers a head start in building a nest cavity, which can take two years to complete, and they have planted pine seedlings on 385 acres to promote new growth.

The woodpecker's habitat is also protected at Fort Benning and at a dozen other military bases. One base where red-cockaded woodpeckers appear to be doing well is Fort Bragg near Fayetteville, North Carolina. Home of the Army's 82nd Airborne Division, Fort Bragg trains 40,000 troops a year. The fort also houses approximately 300 woodpecker clusters, a series of pine trees inhabited by groups of birds.

At Fort Bragg, nearly a dozen biologists study and monitor red-cockaded woodpeckers, especially during breeding season, says Army wildlife biologist Alan Schultz. To aid the woodpeckers, the biologists burn undergrowth and remove hardwood trees that make the habitat unsuitable for the pine trees the

woodpeckers need for nesting. They also band the birds for population and genetic studies. Fort Bragg biologists keep tracked vehicles out of cluster sites and have closed some firing lanes to protect the birds.

To protect a butterfly species, the Navy halted construction on a pipeline at a fuel depot in San Pedro, California, 25 miles south of downtown Los Angeles. In 1994, workers discovered the Palos Verdes blue butterfly there. Thought extinct in the early 1980s when their last known habitat was bulldozed, naval biologists at San Pedro have found 270 PV blues, as the butterfly is known. Navy biologists are surveying the fuel depot for other butterflies, monitoring the population, and restoring the coastal scrub habitat that the species requires, says Dawn Lawson, a Navy botanist.

Further south, wildlife biologists at Camp Pendleton are helping conserve the least Bell's vireo. Once common in riparian forests from northern California to Baja, the least Bell's vireo was listed as endangered in 1986 when the population dropped to only 300 pairs in California. Now, the bird is making a comeback at Pendleton.

For 15 years, marine biologists and land managers have protected the Santa Margarita River and its riparian woodlands, says Pendleton's Buck. More important here, they have also trapped and removed brown-headed cowbirds, which are recent arrivals in California.

Female cowbirds lay their eggs in vireo and other birds' nests, fooling the latter into raising cowbird chicks often at the expense of their own. The least Bell's vireo numbers at Pendleton have risen from 14 in 1980 to an estimated 350 today, nearly half the species total US population.

The Marine Corps also provides money and habitat for a study of how habitat changes and fragmentation affect mountain lions in rapidly urbanizing areas adjacent to Camp Pendleton in southern California. Paul Beier, assistant professor of

wildlife ecology at Northern Arizona University in Flagstaff, spent four years studying Pendleton's pumas.

Approximately 20 mountain lions wander nearly 1300 square miles of woodlands, chaparral, and coastal scrub that characterize Pendleton and the Santa Ana Mountains to the east. Beier has found that the big cats rapidly adjust to the burning of chaparral and coastal scrub at Pendleton caused by exploding bombs and artillery shells. The mountain lions may temporarily lose the cover they need to ambush deer and other large prey, but they switch readily to raccoons, beaver, opossums, and other small animals.

Beier also learned that corridors connect separate mountain lion habitats around Pendleton. The corridors, one of which is on the base, are especially important for young mountain lions, which use them to disperse from their mother's home range. The young lions can find and use the corridors, he learned, if they contain sufficient woody cover, road underpasses, and only low-density development.

Further inland, in California's Mojave Desert, four military bases—the Navy's China Lake, the Marine Corps' Twentynine Palms, Edwards Air Force Base, and the Army's National Training Center at Fort Irwin—total 2.6 million acres of some of the nation's best desert habitat. They protect the desert tortoise, one of the three land tortoises in the United States. The animal is a threatened species. North and west of the Colorado River, desert tortoise numbers have dropped due to habitat loss, the destruction of its burrows by off-road vehicles, and a fatal upper respiratory disease spread by pet tortoises freed by well-meaning owners.

"We want to protect the tortoise and its habitat," says Roy Madden, a natural resources officer at Twentynine Palms, a 600,000-acre Marine desert training facility. "It's an important species in the desert. Military training and tortoise re-

covery are not mutually exclusive."

The Marine Corps has set aside 6000 acres for desert tortoises and adopted a management plan for the rest of Twentynine Palms. The designated site contains the highest tortoise density on the base. Off-road vehicles are prohibited, speed limits of 25 miles per hour have been set, and aerial bombing sites have been moved. Madden has also begun a four-year, \$40,000 test project aimed at reestablishing native plants and restoring tortoise habitat.

East of Twentynine Palms, the Air Force has designated 60,000 acres at Edwards as critical desert tortoise habitat. Mark Hagen, a natural resources manager, surveys the base to identify areas requiring tortoise management and to locate burrows. He uses the information to remove any of the reptiles living near pads used to test rocket engines. The tortoises are carefully returned to their burrows following the tests.

Similarly, the Navy has established a 200,000-acre protected zone for desert tortoises at China Lake. Not only must vehicles stay on marked roads, biologist Tom Campbell says, but all work within the area is closely monitored and restricted to approved places. When necessary, Campbell also monitors weapons tests to ensure any effects on tortoise habitat are minimal and any leftover explosives or other debris are cleaned up afterwards.

Meanwhile, back at Aberdeen Proving Ground, the bald eagles are the subject of research on the importance of the base for recovering endangered species. On contract with the Army from 1983 to 1992, James Fraser, a professor of wildlife sciences at Virginia Polytechnic Institute in Blacksburg, studied eagles along the northern Chesapeake Bay. During that period, he followed some 300 eagles and radio tagged 154, including 22 at Aberdeen.

Fraser learned the Chesapeake acts as a meeting ground for three separate bald eagle populations. One comprises birds that breed or were

hatched along or near the bay. A second group includes eagles that migrate to the bay each fall from northern New England and eastern Canada. The third is the birds that come north each spring, then return south in the fall.

More important, perhaps, Fraser found that bald eagles prefer the undeveloped forests and shorelines still available at Aberdeen and some other sites along the Chesapeake. They avoid places used by people, such as areas around roads, buildings, and marinas. At Aberdeen, the eagles prefer areas downrange from artillery and tank firing zones because, he says, "shooting keeps people away."

### Will the legacy continue?

Whether such research and conservation efforts on military bases continue depends on the budget-slashing atmosphere in Washington. Republicans in Congress have criticized nonmilitary programs in DOD, and, insiders say, the legacy program remains unpopular with some military leaders because it forces them to spend time and money on nonmilitary activities.

At the same time, some military bases lack enough biologists and resource managers to run research programs. At White Sands Missile Range in New Mexico, the Army currently has only three natural resource managers for the base's 2.2 million acres. "There are so many projects that we have been unable to do," says David Anderson, White Sand's land manager.

Nevertheless, the outlook for research and conservation on military bases remains good. "We still have the habitat," says Buck. "We don't have anything you can't find elsewhere, we just have more of it. We have wild places that don't exist for many species on the outside." □

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