

By John Slown, AICP

Taking Refuge



U.S. Fish & Wildlife Service

**Imagine a dry-as-dust
land baked by 118
degree summer heat,
crossed by a single
road, and facing
25,000 trespassers
each year.**

Jake Bacon, Arizona Daily Sun

On its 100th anniversary, the Wildlife Refuge System is coping with a constellation of issues. Some 94 million acres are at stake.

Throw in the most severely endangered large mammal in North America and thousands of acres of designated wilderness. That's the planning context for the Cabeza Prieta National Wildlife Refuge southeast of Yuma, Arizona.

The U.S. Fish and Wildlife Service is preparing a new 15-year facility master plan—a Comprehensive Conservation Plan (CCP) for the refuge—and expects to finish a public review draft by the end of this year. That plan must take into account that Cabeza Prieta, though only one of 541 refuges nationwide, is one of the largest and faces some of the most difficult challenges.

Especially challenging is the effort to save the Sonoran pronghorn. The Cabeza Prieta refuge is taking the lead in the recovery effort for this subspecies of the American pronghorn—the “antelope” in the old Western song, *Home on the Range*. This pronghorn is the fastest land animal in North America; it uses its speed, combined with eyesight comparable to a person with six-power binoculars, to evade predators. Major contributors to the Sonoran pronghorn's decline are the





The endangered Sonoran pronghorn is protected in the Cabeza Prieta National Wildlife Refuge in Arizona.

fences, railways, irrigation canals, and highways that fragment its habitat.

The Sonoran pronghorn is capable of ranging widely and likely could move to wetter areas during regional droughts before barriers were built. Until last year, the U.S. sub-population of Sonoran pronghorn had varied between 100 and 300 since modern surveys were initiated in 1994. But during the extreme drought year of 2002, the population plummeted to between 18 and 35 animals.

Facing a crisis, the refuge and managers of adjacent public lands are now engaged in emergency measures, including creating forage plots, areas of desert irrigated to mimic rainfall in a wetter than average year. The short-term goal is population stabilization.

Later actions will include transplanting breeding stock from the larger, but also endangered, Mexican sub-population to prevent genetic degradation from inbreeding.

The refuge occupies some 860,000 acres. It was established in 1939 by an executive order of President Franklin Roosevelt "for the conservation and development of natural wildlife resources." Although desert bighorn sheep (a separate species from the pronghorn) are not specifically mentioned in the executive order, the field notes of the federal biologists who surveyed southern Arizona and California in the 1930s and other documents show that conservation of desert bighorn sheep was the central purpose behind setting up the refuge.

The state of Arizona very strongly supports

maintaining a healthy population of desert bighorn sheep on the refuge and cooperates with the refuge to manage a limited hunt (one to eight permits per year) based on the sheep population. That population is now estimated at 353 in the refuge and 6,000 statewide.

An act of Congress in 1990 designated 93 percent of the refuge as protected federal wilderness. This wilderness designation raises questions about long-practiced management actions for both the Sonoran pronghorn and the desert bighorn sheep. Since the 1960s, the refuge has been hauling water to natural and developed water holes during dry times of the year. In an average year, the wilderness gets only three to nine inches of rain.

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In Alaska, Oil is Still the Issue

The debate over whether or not to open the Arctic National Wildlife Refuge to oil and gas exploration centers on one thing. It's all about a way of life.

Gwich'in Athapascan Indians say that drilling in sensitive caribou calving grounds would disturb a caribou herd they depend on for food and therefore curtail an ancient subsistence way of life.

But Inupiat Eskimos who have benefitted directly by the economic boom of Alaska North Slope oil production want paychecks available for coming generations.

"I'm thinking about my grandchildren," says Herman Aishanna, an Inupiat and supervisor for North Slope Borough municipal services in Kaktovik, a small community (pop. about 275) in the refuge. "I don't want them to have to go Fairbanks for jobs. The caribou is not going to die off or anything. We hunt that herd, too."

President Bush's 2004 budget proposal, now being considered in Congress, estimates that lease sales in the refuge would generate \$2.4 billion by 2005. Alaska would get half that amount, the federal government the other half. Part of the revenue would go toward developing alternative energy sources.

This is the third time the Bush administration has brought forward this proposal, and Alaska's congressional delegation has tried for years to legalize exploration in the Arctic refuge. Past efforts were unsuccessful, and last month, once again, the U.S. Senate voted to strip funding out of the federal budget.

The refuge, now commonly referred to as ANWR, was created in 1960 by an executive order of then Secretary of the Interior Fred Seaton, who called it the Arctic National Wildlife Range. His intent was to protect the wildlife, wilderness, and recreation value of 8.9 million acres of arctic land. In 1980 Congress enacted the Alaska National Interest Lands Conservation Act, which renamed the area a refuge and expanded its land mass to its current 19 million acres. It is the nation's northernmost wildlife refuge and one of the largest.

Located in northeastern Alaska, ANWR is bordered by the Beaufort Sea on the north and the Canadian

border on the east. It is about 200 miles from Fairbanks. At its widest point, the refuge measures about 200 miles from east to west. The entire North Slope covers about 89,000 square miles, including parts of ANWR. About half the refuge falls within the jurisdiction of the North Slope Borough.

The 1980 law set aside eight million acres as wilderness and specifically called for the protection of the Porcupine caribou herd, used by Alaska Natives for food. The herd forages in the refuge for food, and in one section along the coastal plain, caribou cows birth their calves in the spring.

North Slope oil was discovered in 1968, but the birthing area falls in what is known as the 1002-Area, where interest in potential oil and gas exploration has been intense since at least 1906. Within the 1002's 1.5 million acres, oil creeping up through the soil seemingly holds promise of vast wealth underneath. A 1998 U.S. Geological Services report suggests that between 4.3 and 11.8 billion barrels of oil might be recoverable.

"That's a lot of oil," says Mark Myers,

director of the Alaska Division of Oil and Gas. Work in ANWR could continue for 30 years, he says. "It could be several hundred barrels a day to up to a million," Myers adds. "It could be staggering."

Currently, nearly one million barrels of North Slope crude flow daily through the 800-mile trans-Alaska oil pipeline, making up about 17 percent of the nation's oil production. At its closest point, the pipeline is within a couple of miles of ANWR's western border.

Opening ANWR could mean more money for the state's general fund. Currently, the state receives \$1.2 billion to \$2 billion a year from royalties, taxes, and fees on oil production. ANWR could produce more, says Larry Persily, the state's Deputy Commissioner of Revenue. "It could be hundreds of millions to the state," he says. "If there is a lot of oil, then we'll make a lot of money."

North Slope oil production has been declining. The reduction, coupled with volatile oil prices, mean that the state government could face a budget shortfall of about \$500 million for fiscal year 2003, Persily says. The North Slope Borough, which is funded by property taxes paid by oil companies, also has seen a decline in revenue, says Mayor George Ahmaogak. In the last three years, \$15 million has been cut from the borough's budget, and \$18 million will be cut over the next three years, Ahmaogak adds.

While the North Slope Borough's current budget of \$127 million may seem high for services for the 10,000 people that live and work in Alaska's far north, Ahmaogak points out that the cost of living is also high. A gallon of milk can cost up to \$8.

The North Slope Borough Assembly last year passed a resolution supporting the opening of ANWR, Ahmaogak says. "The resolution still stands," he says. Right now about 1,200 people work for the borough and another 2,300 people work as contractors. The borough provides water, sewer, trash, police and fire protection, and other services for eight communities. About \$23 million of the borough's budget goes toward education.

But Athabascan Gwich'in who live in communities hundreds of miles from North Slope oil fields and steadfastly defend an ancient way of life



Should the Arctic National Wildlife Refuge be open to oil drilling? Native Americans who depend on caribou (above) say no; those who depend on revenue from oil production say yes.

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that depends on wild game, flora, and fauna for food say that culture shouldn't be sacrificed for fleeting monetary gain. They fear oil production will disturb pregnant caribou cows, and herd numbers will decline. Once there are no caribou and no more oil, how will families live then, they ask.

"We refuse to sacrifice our way of life and culture for six months of oil, which won't be available for 10 years," says Faith Gemmill, speaking for the Gwich'in Steering Committee. "President Bush and his administration need to honor the inherent sovereign human rights of the Gwich'in and not promote unsustainable energy development, which would devastate our way of life."

In 1988 the steering committee was established to "insert cultural survival as a major issue in the debate" over opening ANWR to oil and gas exploration. About 7,000 Alaskan and Canadian Gwich'in live near the Porcupine herd, which numbers about 123,000.

About 95 percent of Alaska's coast is open to exploration, the Gwich'in point out. ANWR represents five percent of that area. The oil in the refuge would not significantly impact oil prices nor decrease our dependence on foreign oil, they say. "America does need a sound national energy policy, but we simply can't drill our way to lower prices or energy independence," the web page says.

Support has come from environmental groups and, indirectly, from the National Academy of Sciences. A draft report issued by the Academy last month says that North Slope oil extraction has impacted both plant and animal life in the area. (See www.nas.edu.)

Environmentalists have long argued this was the case. This year, as in past years, legislation has been introduced in Congress to designate the coastal plain as wilderness. The Wilderness Society, a national environmental group, recently released results from a poll noting that 62 percent of 1,015 polled Americans support a ban on drilling in ANWR.

In Alaska, the Northern Alaska Environmental Center has been working to keep oil and gas production out of ANWR. "We should be focusing our energies on promoting alternative energy," says Deb Moore, the Arctic coordinator for the Fairbanks-based center. "ANWR is still a symbol to the American people of a place untouched by development." *Diana Campbell*

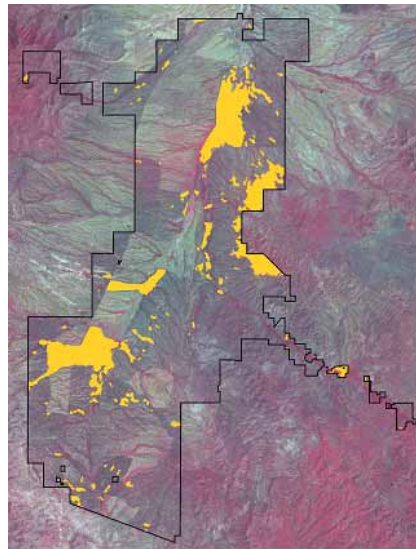
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Wilderness advocates in and outside the Fish and Wildlife Service have lobbied to stop water hauling and remove developed water holes. In their view, these are violations of the Wilderness Act's general prohibition of motorized and mechanized transport, or permanent structures. Wildlife interests, including hunting groups, have lobbied heavily to continue or increase water hauling.

The refuge argues that the developed waters and water hauling conform with the act's exceptions for activities needed to administer the area as wilderness. In this view, wildlife supported by the enhanced waters are wilderness resources, and changed conditions (habitat fragmentation, introduced disease) necessitate the measures.

Complications

There are also border problems. Cabeza Prieta National Wildlife Refuge shares about 50 miles of border with the Mexican state of Sonora. Stepped up border enforcement in urban areas has channeled undocumented immigrants and narcotics smugglers into more remote areas such as the refuge.



Buenos Aires National Wildlife Refuge, in south central Arizona, from a Landsat ETM satellite image acquired August 21, 2001. The image is displayed as red, green, and blue (RGB) image bands 4,3,2, similar to a color infrared photograph. The black line is the refuge boundary and the yellow areas represent areas of potential land-cover change. Changes in woody vegetation cover that occurred between 1986 and 2001 were quantified and interpreted using historic and current high resolution ortho-photography.

Sensors placed on known crossing routes by the U.S. Border Patrol record 4,000 to 6,000 illegal crossings per month during the busy migrating months of April, May, and June. As the sensors only record at discrete points, the actual number of crossings is likely higher. This volume undermines the refuge's wilderness character and wildlife habitat. Refuge Manager Roger DiRosa estimates that between 20 and 30 abandoned vehicles litter the refuge at any given time, although staff attempts to remove them as quickly as possible. Vehicle tracks endure in the arid Sonoran Desert, and debris accumulates as foot travelers discard excess items.

"We should remove 'pristine' from the lexicon—this refuge is no longer pristine," DiRosa says.

The increase in narcotics smuggling also raises potential danger to refuge staff and visitors. A park ranger at Organ Pipe Cactus National Monument, abutting the refuge on the southeast, was recently shot and killed by a narcotics trafficker during enforcement operations. Refuge biologists, who frequently work in the back country and carry no weapons, favor working in casual clothes rather than their Fish and Wildlife Service uniforms, to avoid being mistaken for law enforcement personnel.

Other federal jurisdictions surrounding the refuge are the Barry M. Goldwater Range (operated by the Air Force and Marine Corps) and Bureau of Land Management property. Farther east, the Tohono O'odham Reservation, one of the largest Native American reservations in the U.S., extends nearly to Tucson. Refuge planning requires coordination with these neighbors. At a recent public meeting in Yuma, a member of the County Board of Supervisors testified that "anything you [the service] do is okay, so long as you don't hurt the Marines."

Other pressures

While most refuges do not face major international border issues, resource conflicts are nothing new to the National Wildlife Refuge System. This system, administered by the Fish and Wildlife Service, is the largest collection of lands and waters dedicated to wildlife and habitat conservation in the world. It includes more than 94 million acres in 541 refuges.

From local planning issues such as recreational beach access at Forsythe National Wildlife Refuge in New Jersey to the national policy debate over opening refuge wilderness to oil exploration in Alaska, managers face demands that conflict with, or distract from, their primary role of fostering wildlife and habitat conservation. A well prepared com-



Paul Kroegel, Pelican Island's first warden.

100 Years of Wildlife Conservation

The first national wildlife refuge was created on March 14, 1903, by President Theodore Roosevelt. Pelican Island, a small island in Florida's Indian River, which supported the only remaining nesting colony of brown pelicans, became the first "federal bird reservation." Paul Kroegel, a local resident known for his commitment to protecting birds, became the first refuge warden. He was paid \$1 per month by the federal government and \$7 per month by the Florida Ornithological Society.

Although it may be difficult to imagine today, when white-tailed deer and Canada geese are considered lawn and garden pests in many U.S. suburbs, America's native wildlife was in decline during the late 19th and early 20th centuries. A 1916 U.S. Department of Agriculture news release announcing the creation of the Pisgah National Forest in North Carolina, previously a private estate, touted plentiful deer, wild turkeys, and pheasants—in contrast to the "hunted out" condition of the Southeastern mountains in general. The depletion of wildlife had many causes: widespread habitat conversion to agriculture, unregulated hunting, and, in the case of many water birds, extensive market hunting for plumage used in the millinery trade.

By the end of his presidency in 1909, Teddy Roosevelt had set aside 53 Biological Survey Reservations from the public domain. He neatly summed up his wildlife conservation ethic this way: "Wild beasts and birds are by right not the property merely of the people who are alive today, but the property of unknown generations whose belongings we have no right to squander." His vision has grown to include 541 refuges encompassing more than 94 million acres.

prehensive conservation plan assists management in focusing resources and programs on achieving the purposes for which the refuge was established and the system's mission.

Tom Baca, Southwest region planning coordinator, recently attended a meeting of refuge managers. Having polled managers, he reports that "managers involved in CCP preparation find it a real pain, but those with completed plans appreciate their assistance in refuge management."

An all-around approach

Comprehensive planning for the National Wildlife Refuge System is fairly new. Although the system was established in 1903, the first planning positions were not created until the 1960s. Lynn Greenwalt was hired as a refuge planner in 1962, and later became director under Presidents Ford and Carter. He remembers early plans focusing primarily on physical facilities such as boundary fencing, adequate employee housing, and modest visitor facilities.

"It took a long, long time to convince people like congressmen that something more than a boundary fence was needed," Greenwalt said recently. With scarce resources and remote locales, refuge managers were largely autonomous in their management decisions. Although some national planning guidelines existed, refuge planning was largely driven by individual refuge managers.

The National Refuge System Improvement Act Amendments of 1997 mandated a comprehensive conservation plan for each refuge and established a deadline of 2012 for completion of those plans as well as a renewal schedule. The act also established in law the system's key principles, many of which had long been defined only by agency policy or corporate culture.

Most importantly, the act clarified that wildlife come first at refuges; it established six priority public uses that should be provided when possible. These uses are hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. A compatibility determination for every public use proposed is included in the CCP, as is a vision statement for the refuge with goals and objectives for achieving the vision.

This statement of the priority public uses has helped to keep public use focused on the system's wildlife conservation emphasis. Non-priority public uses are typically allowed if they are compatible and support one of the priority uses, such as horse-packing for hunting access or camping to facilitate wildlife watching where off-refuge alternatives are not available.

The 1997 act, as well as subsequent service director's orders, also specified that the states are the service's special partners in conservation and thus deserve an active role in CCP development.

A nationwide emphasis on planning followed in the wake of the 1997 law. Regional offices enlarged their planning staffs and obtained larger budgets for planning. In August 2000, the service hosted a national planning conference.

Remote sensing

As planning progressed, certain trends emerged. One was a lack of high-quality baseline refuge geographical data. This is being addressed by remote sensing scientists who are developing standardized baseline GIS map layers. A review of existing spatial data on each refuge slated for a CCP during the preplanning stage can identify needed data layers. These typically include vegetation data from recent infrared aerial photos; developed facilities such as water control structures, visitor centers, roads, and maintenance shops; and political boundaries in and around the refuge, available from U.S. Census TIGER maps.

Landsat images are generally too small scale for use in mapping refuge resources, but they can be helpful in documenting large-scale regional changes such as wildfires and feedlot development around the refuge. Digital elevation models, for which standard protocols are under development, could provide important slope and aspect information from satellite data.

Once initial baseline data are captured, a GIS package can be developed for use by the planner and the refuge manager to create a plan implementation and monitoring system. Tying existing databases used at refuges, such as seed production density and bird use records, to the GIS program can enhance its power as a management tool. By rephotographing areas over time, managers can see changes that occur in response to refuge management and external forces.

Aerial photography, long employed by the service for monitoring waterfowl and other wildlife populations, can thus be vital to effective refuge planning and plan implementation. According to Patrick Donnelly, Southwest region remote sensing scientist, "The perspectives that we can obtain through satellites and airborne infrared digital cameras offer a significant bridge to understanding what's going here on Earth. It's our job to cross it."

Unlike most municipal master plans, CCPs are subject to the National Environmental Policy Act (NEPA) as federal actions with the potential to affect the human environment. NEPA's scoping requirements reinforce the

Endangered Flora



Courtesy: USFWS

The Antioch Dunes evening primrose, one of two endangered species in California's Antioch Dunes National Wildlife Refuge.

public involvement necessary to develop effective plans. The service formerly had a spotty record on public and other stakeholder involvement in management plans, but has a better record with CCPs. NEPA also requires that alternatives be considered, which reinforces similar requirements in the CCP policy.

In the field

The CCP for Antioch Dunes National Wildlife Refuge on the San Joaquin River in Contra Costa County, California, was completed in August 2002. Compared to Cabeza Prieta, this refuge is tiny, with 55 acres of refuge lands abutting 12 acres of Pacific Gas and Electric Company land. PG&E allows the service to conduct biological surveys on its land and is negotiating an agreement that would allow the service to manage its land as well.

The California refuge contains the last remnants of the Antioch Dunes, a system of river edge sand dunes that once extended over a much larger area. Other than the refuge, the PG&E land and about five adjacent acres, the dunes have been displaced by development or commercial sand mining. Two endangered plants, the Contra Costa wallflower and Antioch Dunes evening primrose, as well as an endangered insect, Lange's metalmark butterfly, live only on these dunes.

Established in 1980, Antioch Dunes was the first refuge dedicated to endangered plants and insects. Keeping populations of the three endangered species viable on a small site requires fairly intensive management techniques, such as periodic dune disturbance (including reconstructing dunes with sand brought from offsite) and prevention of wildfire in the butterfly's buckwheat habitat.

The refuge has been closed to the public since 1986. Leslie Lew, planning branch chief for the California/Nevada Refuge Planning Office, says that illegal entry and camping by homeless persons was identified as a major issue during the planning process. The small refuge is located in a built-up setting and lightly patrolled. As many as five campsites have been found in one day. The CCP calls for increased cooperation with local and state law enforcement to initiate weekly patrols on the refuge, as well as increasing refuge staff presence on the refuge.

The Edwin B. Forsythe refuge, located on the New Jersey shore, includes more than 46,000 acres of coastal wetlands and near-shore woodlands. The refuge was created to provide habitat for waterfowl and shorebirds. The refuge hosts more than 300,000 visitors each year.

Forsythe's CCP was completed in September 2002. The greatest controversy by far in this CCP was motor vehicle use on the refuge's Holgate Unit beach. This beach has been closed from April to August each year since the late 1980s to protect the threatened Atlantic Coastal piping plover's nesting habitat. At the same time, Holgate beach has long been popular with surf anglers, who drive down the beach to reach prime fishing areas at its southern end. As the best fishing is in the fall, anglers generally accepted the seasonal closure.

The federally owned portion of the beach, that area above mean high tide, was designated as wilderness by Congress in 1975. Land below the mean high tide line is owned by the state of New Jersey and is therefore outside the federal wilderness. Wilderness designation prohibited all motor vehicle use on the federally owned beach, but the prohibition was not enforced.

The draft CCP proposed enforcing the prohibition and requesting a license from the state to close the adjoining intertidal land as well. The final CCP prohibited motor vehicle use on the area landward of the beach berm crest, where there was one, and landward of the wet sand/dry sand line, where there was no berm crest present. These recognizable natural beach features were chosen, as the mean high tide line is not easily determined in

Resources

Websites. U.S. Fish and Wildlife Service: www.fws.gov; Refuge System: <http://refuges.fws.gov>; CCPs: <http://library.fws.gov/ccps.htm>; NWRS Centennial: <http://refuges.fws.gov/centennial/index.html>.

If you are considering employment with the service as a CCP planner, visit www.usajobs.opm.gov, select "jobs" under "Search Jobs," select "Series" at the next screen, and fill out the form. CCP planners' positions are classified as Series 0401, Biologist, and 0020, Community Planner.

Tours. Consider visiting a National Wildlife Refuge. There's one near you. During the centennial year many special events are planned. A directory of refuges and contact information appears at <http://refuges.fws.gov>. Call ahead for advice about the best time to visit.

the field. Driving below the crest or wet/dry sand line is still permitted.

The state of New Jersey, Rep. Jim Saxton, and local fishing interests objected strenuously to the driving restriction, pointing out that it leaves no space for parking during high tide, often the best time to fish. Wilderness advocates also took exception.

During 2002, the first year the new Holgate Unit regulations were implemented, anyone driving on the beach landward of the beach berm crest or the wet/dry line was contacted and given detailed information about the new regulations. Norman Olson, planning coordinator for the service's Northeast region, says, "The beach closure is a good example of past mismanagement by the service being rectified through the planning process."

Meanwhile, back at Cabeza Prieta

The CCP effort continues at Cabeza Prieta. Critically low Sonoran pronghorn numbers and the flood tide of illegal border crossings get the most attention, but these are only two issues on the planning radar screen. Pronghorn recovery actions are a given and will continue. Border issues are beyond refuge control, but affect all management activities. The planning team is striving to take the long view and develop a balanced strategy that will conserve Sonoran Desert biological communities while complying with the Wilderness Act.

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