



America's 10 Most Endangered
National Wildlife Refuges

2007



REFUGES
AT RISK



DEFENDERS OF WILDLIFE

Defenders of Wildlife is a national, nonprofit membership organization dedicated to the protection of all native wild animals and plants in their natural communities.

AUTHOR

Krista Schlyer

PROJECT DIRECTOR

Noah Matson, Vice President for Land Conservation

PROJECT MANAGER

Noah Kahn, Federal Lands Associate

MAP

International Mapping Associates, Inc.

EDITORIAL TEAM

Editor: Heidi Ridgley

Art Director: Jen Lee

Photo Editor: Krista Schlyer

© 2007 Defenders of Wildlife

1130 17th Street, N.W.

Washington, D.C. 20036-4604

202.682.9400

Cover Photos: Pea Island National Wildlife Refuge © Thomas R. Fletcher; Loggerhead hatchling © Doug Perrine/seapics.com



Recycled

Supporting responsible
use of forest resources

Cert no. SCS-COC-00635
www.fsc.org

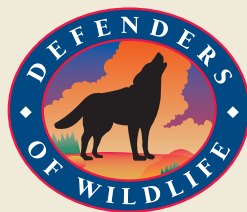
© 1996 Forest Stewardship Council

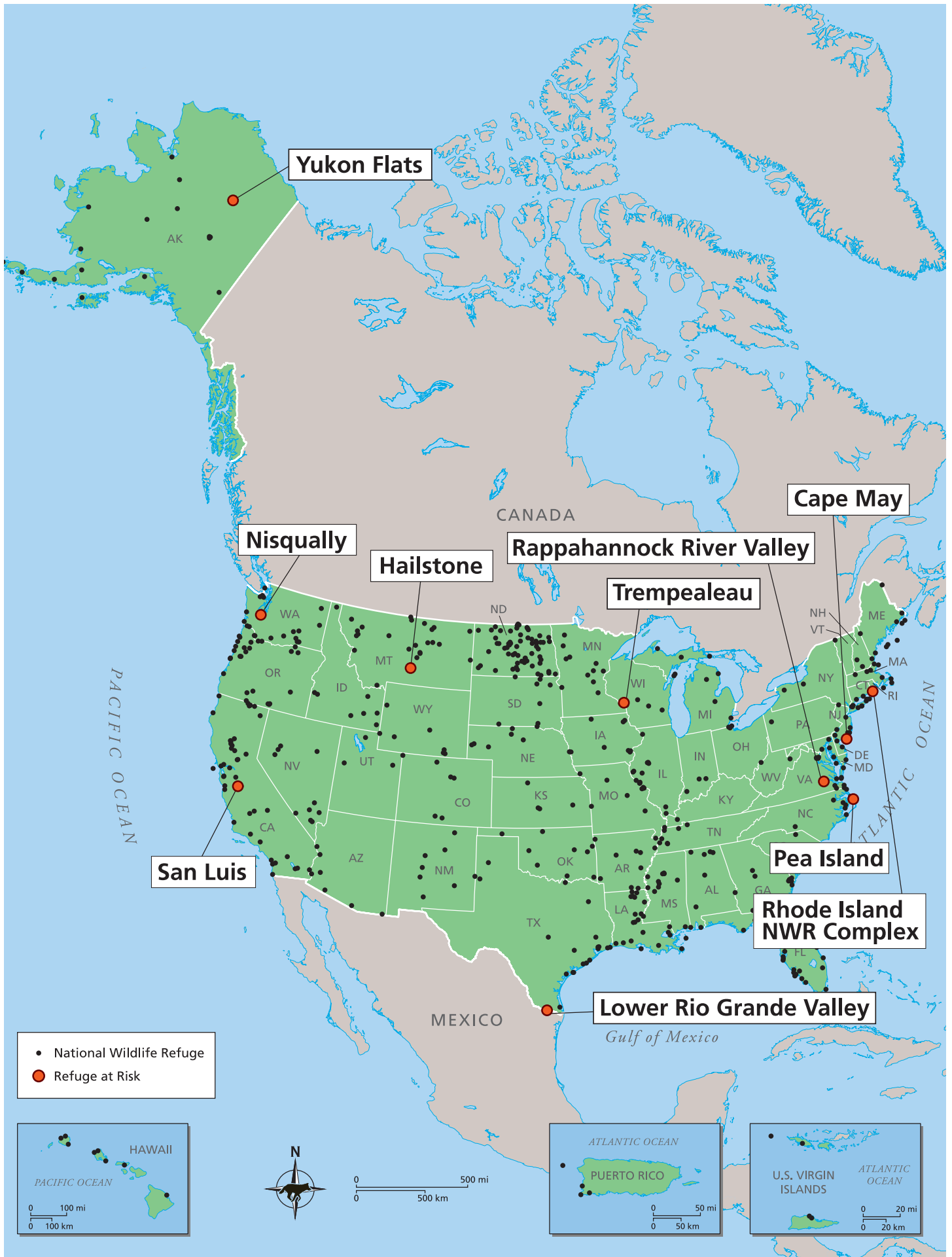
Printed on 100% post-consumer-waste, process-chlorine-free recycled paper manufactured with wind power, creating the following environmental benefits: 10.14 trees not cut down; 4,306 gallons of water/waste flow saved; 476 pounds of solid waste not generated; 938 pounds of greenhouse gases prevented; 7,180,800 Btus of energy not consumed; 487 pounds of air emissions not generated.

REFUGES AT RISK

America's 10 Most Endangered National Wildlife Refuges

2007





“The mission of the system is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

—The National Wildlife Refuge System Improvement Act of 1997

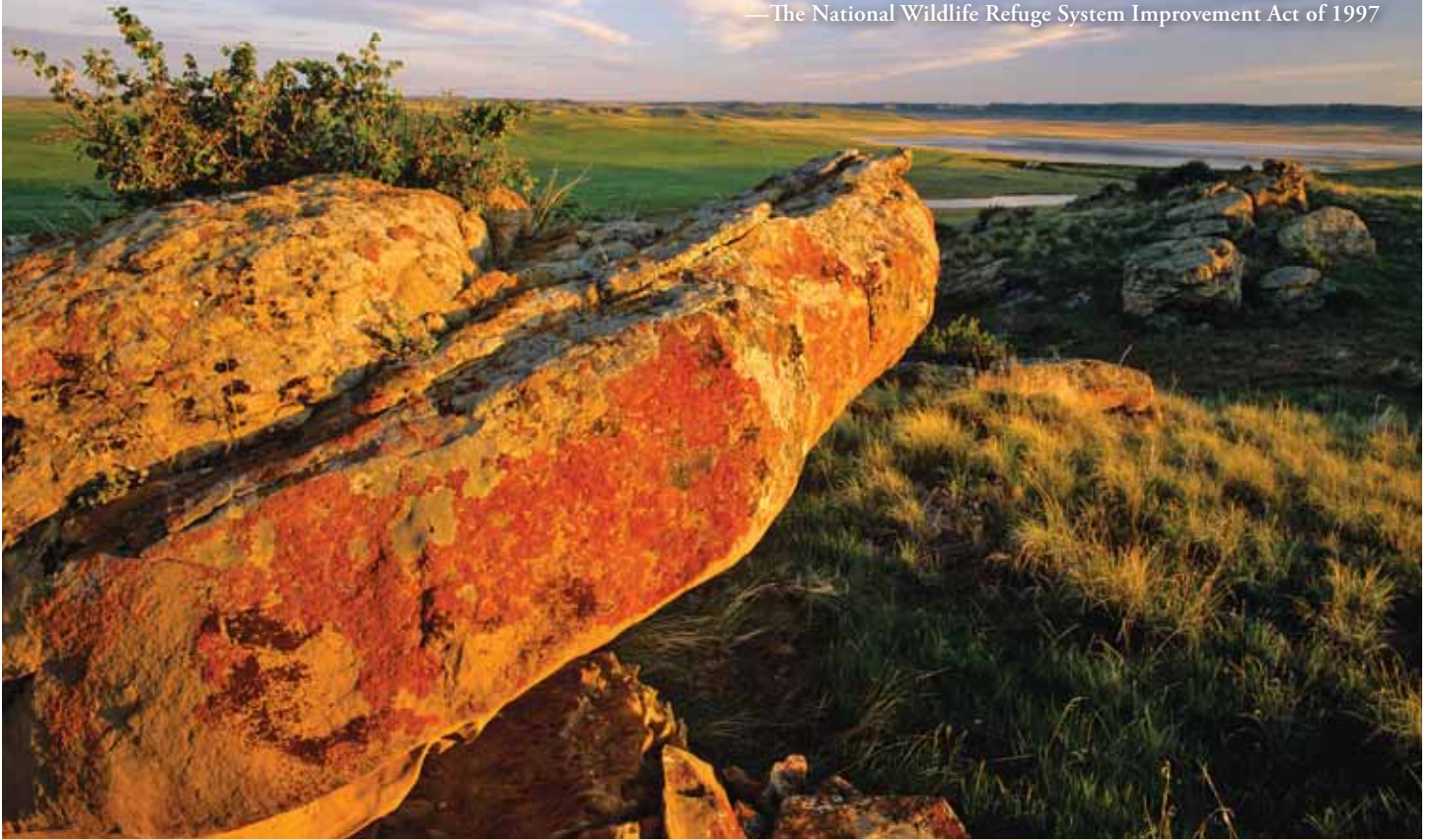


TABLE OF CONTENTS

INTRODUCTION	2
THE 10 MOST ENDANGERED REFUGES	
Yukon Flats	4
Pea Island	5
Rappahannock River Valley	6
Lower Rio Grande Valley	7
Hailstone	8
Trempealeau	9
Nisqually	10
Cape May	11
San Luis	12
Rhode Island Complex	13
CONCLUSION/RECOMMENDATIONS	14
ENDNOTES	16

INTRODUCTION



Brown pelican | © Tim Fitzharris/Minden Pictures

Just over a century ago, a squat but oddly elegant bird stood on the verge of losing its final safe haven on the eastern shore of Florida. Instead, it altered the future of the American landscape by drawing a visionary president into an unprecedented compact with wildlife. For the National Wildlife Refuge System, it all began with the brown pelican and a tiny mangrove island in the Indian River Lagoon. These unassuming birds ignited a nascent consciousness in a handful of thoughtful people—a recognition that their exquisite plumage ruffling in an ocean breeze carried a value that at least matched the price the birds' feathers would fetch in the fashion industry. And so, in 1903, President Theodore Roosevelt set aside the nation's first national wildlife refuge, Pelican Island, as a preserve and breeding ground for these inspiring birds.

In the years since, presidents, conservationists and Congress

have helped set aside land to save numerous species—from moose in Alaska to panthers in Florida—from the extirpation or extinction posed by an ever-expanding human population. The National Wildlife Refuge System has grown from a handful of swatches of protected land to more than 545 refuges covering nearly 100 million acres of habitat critical to the survival of thousands of North American plant and animal species. Today's system of refuges draws 40 million visitors annually and contributes significantly to regional economies—providing more than 27,000 jobs and generating more than \$1.4 billion in recreational spending a year.¹

The American public has maintained a century-long commitment to conserving wildlife, but as our footprint upon the land has grown, the factors that threaten the future of wild things and wild places have grown more complicated, requiring

an increasingly thoughtful approach to this system of lands. Refuges—set aside specifically for wildlife conservation—began to falter under increased pressures for oil and gas development, mining, agriculture, cattle grazing and recreational and military usage in the latter half of the 20th century. Motorboats and water-skiing, for example, began overrunning waterfowl breeding areas, and mining and oil production contaminated land and water. The U.S. military even detonated a five-megaton nuclear blast—the largest underground nuclear test in the nation’s history—at the Alaska Maritime National Wildlife Refuge in 1971.²

In 1989, refuge managers reported that harmful secondary uses were damaging habitat at almost 60 percent of all national wildlife refuges.³ A year later, Defenders convened an independent commission to examine the status of the refuge system and recommend reforms. The chief recommendation of the commission’s report, *Putting Wildlife First*, was to pass comprehensive legislation that would set standards for the management of the refuge system and bolster the nation’s commitment to preserving wildlife. That happened in 1997 when Congress passed the landmark National Wildlife Refuge System Improvement Act, which outlined these core values and standards, which must be maintained to secure the future of America’s refuges for wildlife:

- Refuges are only opened to uses that are compatible with their wildlife conservation mission;
- The biological integrity, diversity and environmental health of the refuge system must be maintained for present and future generations;
- The refuge system should continue growing strategically in a manner that is best designed to accomplish the mission of the system, to contribute to the conservation of the ecosystems of the United States and to complement efforts of the states and other federal agencies to conserve fish, wildlife and their habitats;
- Water quality and quantity of the refuge system should be maintained to achieve its mission;
- Environmental education and interpretation, wildlife observation and photography and hunting and fishing are prioritized over other uses to foster appreciation of the nation’s wildlife resources;
- Refuges should be managed transparently and involve the public through the development of comprehensive conservation plans.

In this act, Congress meant to set the wildlife refuge system on a path to correct all that had gone wrong in the century

since its inception. But now, 10 years later and eroded by budget cuts and political maneuvering, the system as a whole faces a \$2.5 billion operations and maintenance backlog and is poised to lose 20 percent of its staff nationwide.⁴

To raise awareness and garner support for the refuge system, for the past three years Defenders of Wildlife has profiled a list of 10 refuges that face crippling threats, from global warming to sprawl. This year’s report spotlights refuges dealing with critical issues that should have been unthinkable given the 1997 legislation, including oil and gas development at Yukon Flats in

To raise awareness and garner support for the refuge system, for the past three years Defenders of Wildlife has profiled a list of 10 refuges that face crippling threats, from global warming to sprawl.

Alaska and road construction on Pea Island in North Carolina. Other refuges made our 2007 list because they face threats to their biological integrity, which, according to the decade-old law, must be protected. Refuges like Lower Rio Grande Valley in Texas, Hailstone in Montana, Cape May in New Jersey and Trempealeau in Wisconsin, face threats ranging from a biologically disastrous border fence and selenium contamination to habitat destruction from off-road vehicles and rampant invasive species. One refuge—San Luis in California—is profiled because Congress’ mandate to protect refuge water quality and quantity is not being met. The Rappahannock River Valley refuge in Virginia made the list because of lagging land acquisition due to lack of funding, despite a clear mandate by Congress to prioritize strategic growth of the system. Finally, the Rhode Island refuge complex and Nisqually refuge in Washington are profiled because of drastic funding cuts to recreational and educational uses that Congress supported 10 years ago.

Most of these refuges face shortfalls in more than one category addressed by Congress when it worked to improve the system, and many refuges not on the list still also suffer from the unrealized promise of Congress’ 1997 intentions. But the following 10 refuges exemplify a refuge system that remains under-funded and under-prioritized in an era of mounting environmental threats. They also symbolize broken promises—to the refuge system, wildlife and the American people.

For the brown pelican and for the millions of Americans who might one day have the thrill of seeing this graceful bird glide upon a silver ocean shoreline, a strong refuge system is nothing short of essential.

YUKON FLATS

NATIONAL WILDLIFE REFUGE

Yukon Flats National Wildlife Refuge | U.S. Fish and Wildlife Service

It's springtime on the Yukon Flats refuge in Alaska, at the northernmost stretch of the Yukon River, and millions of canvasbacks, pintails, scaup, wigeon, shovelers and other waterfowl are transforming the landscape. They fly in from 11 foreign countries, eight Canadian provinces and 45 of the 50 states to create the next generation. Along with other migratory birds such as sandhill cranes, trumpeter swans, terns and phalaropes, they alter the 9-million-acre refuge—from a quiet place of about 13 hardy avian species in the bitter, minus-70-degree-Fahrenheit winter, into a spring landscape of more than 150 species engaged in the chaos of courtship and rearing. The throng includes 65,000 northern pintails, 125,000 scaup, 16,000 loons and 100,000 horned and red-necked grebes.

Yukon Flats bears proof—there are still places in the world where wild creatures are so integrated in the seasonal character of the landscape that their migrations thoroughly alter the face of the Earth. This refuge supports one of the highest nesting densities of waterfowl on the continent and has become an increasingly crucial breeding area as prairie pothole habitat in the lower 48 states and Canada has been degraded by agriculture, development and global warming. In addition to its significance for birds, the Yukon Flats is home to black bears, grizzlies, moose (a staple food of local subsistence hunters), caribou and one of the densest populations of lynx in the state. At its core is the refuge's 300-mile-long Yukon River with its endless network of creeks and rivers that provide habitat for 18 species of fish, including coho, Chinook and chum salmon. These fish may travel 2,000 miles to reach and spawn at their natal streams—a longer migration from the sea than on any other river system in the world.

At issue on the Yukon Flats is oil exploration and development. Long fought off at the Arctic National Wildlife Refuge, the battle at Yukon Flats is largely out of the public spotlight. According to the refuge's Comprehensive Conservation Plan (the planning document required of all refuges by the 1997 law and for Alaska refuges by the 1980 Alaska National Interest Lands Conservation Act), oil development is not compatible with the purposes of this refuge and is prohibited. But instead of accept-



ing this decision, Doyon, Limited, an Alaska native corporation, is attempting to negotiate a land swap with the U.S. Fish and Wildlife Service (FWS). The deal, which would give Doyon a single, large block of contiguous refuge habitat with potential oil reserves in exchange for smaller, scattered parcels owned by Doyon within the refuge, is specifically designed to skirt the strong protection

standards for wildlife refuges: If the land is no longer in the refuge, those standards will not apply. This political maneuvering is putting at risk more than 200,000 acres of the refuge—which provide some of the only habitat on the refuge for Dall sheep—and could affect whole communities of species including wolves, wolverines and moose. In fact, the land sought by Doyon is considered so unique and pristine by FWS that the agency proposed in 1987 that the area be designated as “wilderness”—a protective classification reserved for the country's most pristine wild areas. FWS has acknowledged that if the land swap occurs, it would split the proposed wilderness down the middle, which would almost certainly undermine any possibility of future wilderness designation. This ill-conceived land swap would also subject the refuge to the web of roads, pipelines and pollution that inevitably accompany oil and gas development.



Dall sheep | © Michio Hoshino/Minden Pictures

PEA ISLAND

NATIONAL WILDLIFE REFUGE

On a thin, sandy finger of land at the northern end of North Carolina's Hatteras Island, migrating birds and threatened loggerhead turtles have staked a modest claim. In the fall, shorebirds such as the ruddy turnstone, dunlin and marbled godwit crowd upon Pea Island National Wildlife Refuge to rest from their long journeys. In winter, these travelers are replaced by thousands of snow geese that rest here until their return to breeding grounds in the Arctic. Where the island widens enough to support bayside marshes and ponds, herons and avocets, tundra swans, northern pintails and cedar waxwings all forage for food. In all, more than 365 species of birds have been seen on this 13-mile-long ribbon of sand between the Atlantic Ocean and Pamlico Sound. In spring, black skimmers and American oystercatchers settle in to raise their broods, sharing their nesting grounds with piping plovers and loggerhead sea turtles, who bury their eggs in the island's warm sand.

Despite its small size, at about 5,900 acres Pea Island protects an impressive array of habitats, including sand beaches, coastal dunes, freshwater and brackish ponds, saltwater marshes and stands of wax myrtle. The refuge, established in 1937, was named for the dune peas that provided winter sustenance for snow geese and other birds. These geese continue to rely on refuge lands and, along with a parade of other species of birds, 25 species of mammals and nearly 30 types of reptiles and amphibians, Pea Island attracts 1.3 million people every year. They come to be caught up in a dynamic world where waves and winds are forever moving upon this sandy edge of North America.

But wildlife and ocean are not the only forces on the move here. The beach itself is moving westward with every crash of the Atlantic—a fact that makes the presence of Highway 12 a constant conundrum. Dependent on natural and periodic flooding or “overwash” of sand to nourish the marsh, the ecosystem has had to deal with the disturbance—and constant maintenance—of a highway slicing through the heart of a barrier island regularly flooded and buried with sand.

The refuge improvement act makes clear that nonwildlife-dependent uses, such as roads, are not compatible with the purpose of a national wildlife refuge. And in fact, when the North Carolina Department of Transportation recently proposed moving the road farther away from the ocean, which would have required a new right-of-way through pristine refuge property, refuge management said no.

It has, however, become necessary to replace the aging Bonner Bridge, which connects to Highway 12 on Pea Island

and spans Oregon Inlet to the north of the refuge. The state transportation department wants to replace the bridge with a similar one in the same location. The problem is, taxpayers will be spending nearly \$300 million on a bridge that will require the realignment or elevation of sections of Highway 12 to protect it from the Atlantic.⁵ Such an expenditure would effectively turn a national wildlife refuge into a perpetual construction zone, with Highway 12 demanding near-constant cleanup from regular flooding and sand overwash. Its proximity to the ocean also results in lengthy closures following storm events and in the inevitable event of



Black skimmer | © Johann Schumacher

a complete washout, residents and visitors to the Outer Banks would literally be trapped.

There is an alternative. The U.S. Fish and Wildlife Service, conservationists and many others support building a bridge through Pamlico Sound, which would completely bypass Pea Island refuge. Although initially more expensive, this approach would eliminate the costly and constant maintenance of Highway 12 (which is estimated by the state's Department of Transportation to cost up to \$912 million by 2060)⁶, would allow the refuge to restore habitat damaged by the road and would provide a safer and more reliable route for residents and tourists of Hatteras Island. Despite the clear benefit of the longer bridge for people and wildlife, and the refuge improvement act's clear mandate to avoid damage to refuge resources, the state's transportation department is pursuing the short bridge and relocation of Highway 12 through the refuge.

RAPPAHANNOCK RIVER VALLEY

NATIONAL WILDLIFE REFUGE

In a tangle of twigs and grasses in the crook of a high evergreen limb, sits an eaglet. Apart from its fluff of feathers, it's all mouth, waiting for the return of its parents from a fishing foray in the Rappahannock River and its freshwater marshes. As the hatchling's calls rise to the canopy of this eastern Virginia forest, it joins a lively chorus of other flightless birds. Last year, 193 of these young bald eagles fledged in or near the Rappahannock River Valley National Wildlife Refuge.

The refuge's acquisition border, bounded by the Rappahannock River to the south and west, the Potomac River to the north and the Chesapeake Bay to the east, hosts a greater density of bald eagles than almost any other place on the East Coast. Nearly 400 individuals were counted here last year, making this refuge a continentally significant area for bald eagle conservation.⁷

But this refuge, established in 1996, also serves as forest habitat for species such as wood thrush and grassland nesting birds such as grasshopper sparrows and northern bobwhite. With more than 225 species of birds present, this refuge has become a rare haven in the densely populated East. Indigo buntings dart in bursts of electric blue, Acadian flycatchers find refuge in the forest, red-winged blackbirds chatter and sing on marsh grasses, while groups of eastern meadowlarks alight upon restored grasslands. They are joined by mammals, reptiles and amphibians, such as the green tree frog that choruses and croons for a mate in spring and river otters and beavers that swim the refuge waters with bass, catfish, croaker and endangered shortnose sturgeon. All these species are buoyed by the diverse plant communities that grow here, including the endangered joint-vetch, turk's cap lilies, marsh hibiscus and wild rice.

As it stands today, the refuge exists as a handful of scattered parcels within a larger seven-county acquisition boundary, where it is authorized to purchase property from willing sellers. Currently, this land remains largely a matrix of high-quality forested and riparian habitat and agricultural fields. But sprawl has been

River otter | © S. Michael Bisceglie/Animals Animals



washing over all of eastern Virginia as populations balloon in Washington, D.C., Fredericksburg and Richmond, gobbling up land in the process. Because the Bush administration has consistently starved the Land and Water Conservation Fund, which is supposed to help purchase land here, and ignored the provisions in the refuge improvement act that call for continued growth of the refuge system, the Rappahannock Valley River refuge remains a hodgepodge of scattered lands.

So far, the refuge has managed to cobble together about 7,700 acres, only a third of its goal, with much help from land donations and private partners. Meanwhile, willing sellers—landowners who want their land protected but can't afford to donate it—are being turned away, and high-priority habitat is being lost to development because the refuge just doesn't have the money. In general, land acquisition for the refuge system has ground to a halt under the Bush

administration, and for the Rappahannock River Valley refuge and the hundreds of bald eagles that depend on it, the spread of development means time is running out to protect one of the last and best places for wildlife in the mid-Atlantic.



Immature bald eagle | © Tim Fitzharris/Minden Pictures

LOWER RIO GRANDE VALLEY

NATIONAL WILDLIFE REFUGE

The south Texas nights still harbor a sound that has nearly disappeared from the United States. In the dense thorn-forest communities of the Lower Rio Grande Valley National Wildlife Refuge, a soft rustling of grasses and the harried, retreating footsteps of small mammals, reptiles and birds, accompanies the padded-foot prowling of two small, endangered cats—the ocelot and the jaguarundi.

These rare cats reach the northern edge of their range in south Texas, and here at this 90,000-acre refuge, already fragmented into nearly 115 parcels, they find some of the last habitat remaining to them in this country. The ocelot and jaguarundi are joined by a community of 513 bird species, including some colorful characters rarely seen elsewhere in the United States. Species like the great kiskadee, least grebe, green parakeet, altamira oriole and green jay travel no farther north than Texas. The bird life here is so diverse and unique that 200,000 eco-tourists visit the area each year, pumping nearly \$150 million into local economies. These rich refuge lands are at the nexus of four climate zones—tropical, temperate, coastal and desert—and the confluence of the Mississippi and Central flyways. In this region, considered one of the most diverse in North America, 11 distinct biotic communities exist—ranging from Chihuahuan desert scrub to tidal wetlands to one of the last remaining sabal palm forests in the country. More than 1,100 members of the plant kingdom have taken root here, as have 700 vertebrate species—including javalinas, bobcats, white-lipped frogs and the highly endangered Kemp's Ridley sea turtle. The refuge also supports more than 300 species of butterflies—half of the species present in the country. Exquisite zebra longwings, Julias and Mexican bluewings can all be seen here. In fact, at peak times in fall, it is possible to see nearly 100 different butterfly species on a single outing.

Designed as a new model for refuges, the Lower Rio Grande Valley refuge was established to create a wildlife corridor and protect rare and unique habitat types, fulfilling the refuge improvement act's call for growing the refuge system to conserve unique and various ecosystems. But human populations have been expanding in the Rio Grande valley. When the refuge was established in 1979, the surrounding population was only a third of what it is today. In the 2000 census, the nearby

Ocelot | © Tim Fitzharris/Minden Pictures



McAllen metropolitan area had the fourth-highest population growth in the nation.⁸ For a refuge geared toward piecing together fragments of habitat being swallowed by development, life under a federal administration that has withheld land acquisition funding for six years is grim. From the outset, the goal of this refuge has been to secure 132,000 acres encompassing each of the rapidly disappearing 11 biotic communities. But it remains 40,000 acres short of its goal. Meanwhile, habitat is disappearing like sand through a sieve. The valley has already lost all but 5 percent of its natural habitat.⁹

And while land is slipping away, the refuge also faces the imminent threat of current refuge lands being divided and degraded by a wall along the United States-Mexico border. The Department of Homeland Security plan would destroy or fragment many miles of refuge habitat, restrict entrance and opportunity for the tens of thousands of eco-tourists—who significantly boost the local economies—and also block access to the Rio Grande River, the primary water source for wildlife and farmers in this semi-arid region. In short, the wall would destroy the very things safeguarded by the refuge improvement act, namely the biological integrity, diversity and environmental health of the refuge.

As for the endangered ocelot, whose recovery depends on access to sister populations in Mexico—and for the 20 threatened and endangered species found on this refuge—the wall would have dire consequences indeed.



Lower Rio Grande Valley National Wildlife Refuge | © Laurence Parent Photography

HAILSTONE

NATIONAL WILDLIFE REFUGE

At Hailstone National Wildlife Refuge, flocks of eared grebes, American wigeons and northern shovelers descend upon wetlands surrounded by nothing but rolling hills of shortgrass prairie and limitless sky. In central Montana, this is *the* place for waterfowl production. Thousands of ducks settle in to nest or just to rest for awhile on their long journeys spanning the hemisphere. This 2,000-acre refuge was created for these winged wayfarers—the mallards, gadwalls, redheads, canvasbacks and other migratory water-dependent birds such as American avocets, phalaropes, American white pelicans and at times, thousands of Franklin's gulls. In all, more than 200 species of birds can be seen here including lark buntings and vesper sparrows. Many are drawn by Hailstone Lake, a 300-acre reservoir created in the 1930s.

The refuge is also home to many prairie species that have found a haven here while so much of the Great Plains' native prairies have been lost to agriculture and development. Black-tailed prairie dogs build towns upon uplands of sagebrush, greasewood and native grasses. They remain constantly alert for the searching eyes of golden eagles and hawks that would make a meal of them. Burrowing owls stand guard at the entrance to their tunnels, motionless sentries at the gates of an underground world. Sharp-tailed grouse shuttle at the feet of pronghorn antelope grazing the wide-open grassland.

While native prairies are a largely lost ecosystem, Hailstone has restored some of its shortgrass prairie. Still, much of the surrounding area remains in the service of agriculture, which supplanted this native landscape and many of the animals that thrived upon it. Loss of the prairie ecosystem has had some devastating environmental effects historically, including the Dustbowl of the 1930s, when drought killed the crops



Hailstone National Wildlife Refuge | © Chuck Haney/chuckhaney.com

that had replaced the more hardy native grasses which had held the earth in place.¹⁰ Today, at the Hailstone refuge, the land and its inhabitants continue to weather the loss of this native ecosystem. When the prairie was intact, rainwater was absorbed into the ground and root systems of plants, but the wheat fields that have replaced the prairie grasses do not hold the water as well, especially in years when they are left fallow. Rainwater then hits the ground and carries salt and selenium deeper into the soil, running along the water table toward the



Mallard | © Rob Curtis/The Image Finders

reservoir. Over the years, the salt and selenium have formed seeps that flow into the reservoir when it rains or when snow melts, creating a toxic soup for birds. The birds die from excessive salt intake, their bodies encrusted and organs overloaded with salt.¹¹ And as evaporation of water further concentrates the deposits, the threat of selenium toxicity grows. The same forces were at work at Kesterson National Wildlife Refuge in California before its reservoir was labeled a toxic waste dump in the 1980s after causing large-scale die-offs and horrible birth defects in birds at the refuge.¹²

The 1997 refuge improvement act included safeguards for ensuring the biological integrity and environmental health of national wildlife refuges, in part, because of the catastrophe at Kesterson. And yet, the Hailstone refuge and its populations of migratory waterfowl are plagued by the fallout from the disintegrating health of its wetlands and animals are literally being poisoned. Further, the toll that agricultural runoff is having on migratory bird habitat is not limited to Hailstone. There are similar contamination issues at other refuges in the prairie region, all of which are essential to the systemic health of the Mississippi Flyway and the birds that migrate through.

TREMPEALEAU

NATIONAL WILDLIFE REFUGE

In spring, at the edge of marshlands thick with water lilies and bulrushes, black terns and wood ducks go to work assembling a family home and nursery for the season. Terns dredge marsh plants decaying on pond bottoms and make small floating nests for their eggs. Wood ducks arrange twigs and grasses in the cavities of hardwood trees, softening the cradle with down from the female's breast. And so begins the next generation at Trempealeau National Wildlife Refuge.

Thousands of wood ducks and black terns share the Wisconsin skies above the confluence of the Trempealeau and Mississippi rivers with monarch butterflies, blue-winged teal and hooded mergansers. Some 250 species of birds appear here, including double-crested cormorants, indigo buntings and more than a dozen species of warblers.

Congress set aside this land in 1936 as habitat for migratory waterfowl and other wildlife in the heart of the Mississippi Flyway. Though much of the refuge's 6,200 acres is marsh and open pools favored by water birds, it also contains hardwood forests, meadows and a rare remnant of sand prairie, long ago sculpted by glacial sand deposits. Several centuries ago, natives referred to this entire region as the Trempealeau Prairie. Back then, it was a land filled with prairie chickens and meadowlarks amid Indian grass, switchgrass and big bluestem, which reached 8 feet tall. With the spread of agriculture, most of the prairie disappeared, along with the prairie chickens. But at Trempealeau refuge, patches of prairie have rebounded and come alive with meadowlarks, grasshopper sparrows, wild turkey, Blanding's turtles and white-tailed deer.

This revival, however, could be a hard-fought but short-lived victory. The salvaged land along with the forests and wetlands here are now under invasion by non-native plants, such as leafy spurge, purple loosestrife, quackgrass, smooth brome grass and black locust trees. These plants are choking out native hardwoods, grasses and forbs and transforming the landscape. In the bottomland forests, invasive species have devoured up to 90 percent of the understory.¹³ And while maintaining the biological integrity and diversity of the refuge is a priority issue—as called for by the refuge improvement act—the

Monarch butterfly | © Allen Blake Sheldon



emaciated refuge system budget has crippled Trempealeau's defenses. Due to lack of funding and inflexibility on how available money is spent, the refuge has had to devote most of its meager resources to guarding the rare and fragile prairie habitat, while conceding to the invasion of forestlands.

Trempealeau is merely one refuge in a system crumbling under the weight of invasive plants and animals. Invasive species are the top threat to refuges listed by refuge managers nationwide, and an estimated \$361 million of invasive species control projects sit idle, waiting for resources.¹⁴ Given the enormity of the threat, the Fish and Wildlife Service

implemented mobile "strike teams" to assist in controlling the problem. Unfortunately, implementation of these teams has been uneven across the country, and funding for invasives control has been far from adequate. The situation grows worse each year that funds are withheld. At Trempealeau, the staff's ability to monitor and control invasive species is being further eroded by staff cuts while invasive species march unimpeded across the landscape. For species like the wood duck, which is now slowly rebounding from population setbacks in the 1980s, the decline of mature forest habitat caused by invasive trees such as the black locust, Siberian elm and Scotch pine will take its toll. Staff reductions will also mean the end of waterfowl surveys, duck banding and prairie and stream restoration programs, all of which help restore and protect the biological integrity of this refuge.¹⁵



Wood duck | © Allen Blake Sheldon

NISQUALLY

NATIONAL WILDLIFE REFUGE

Where the Nisqually River meets the Puget Sound in western Washington, Mount Rainier hovers above a delta wetland where Chinook salmon pass en route to the waters of their birth. This threatened fish will fight its way upstream—guided by an inner compass—to lay eggs and begin a new generation. But it is only one of the many incredible species inhabiting Nisqually National Wildlife Refuge. This refuge, established in 1974, protects 3,000 acres of habitat for thousands of western sandpipers, dunlin and other shorebirds who forage mudflats for worms, clams, crabs and shrimp. Within this rich landscape male Pacific tree frogs chorus in the night, harbor seals and river otters hunt, and wrens, rails and bitterns tuck themselves into the dense vegetation of freshwater marshes. These creatures have congregated at Nisqually for good reason—it is the last major unspoiled estuary in Washington. Most of the state’s other estuary ecosystems have been filled, dredged or developed. As a rare example of a once-abundant ecosystem, a large portion of this refuge has been designated a National Natural Landmark.

Among those who benefit from this protected landscape are 150,000 visitors a year, including thousands of schoolchildren from nearby Olympia and Seattle on field trips geared toward learning about this complex and fascinating ecosystem. Because of its proximity to these urban areas, the refuge has identified environmental education as its top priority for public use, also a priority provision of the refuge improvement act.¹⁶ Recognizing the need to build understanding and support for the refuge system, Congress emphasized that the refuge system should place a premium on environmental education

Nisqually National Wildlife Refuge | © Terry Donnelly



and other “wildlife-dependent” recreational uses. But in the past six years, cuts in staff and program funding have led to the discontinuation or decline of important programs, such as the one that brought a local middle school to the refuge for a reforestation project. Nisqually’s goal is to serve 15,000 students a year with refuge education programs, but currently the refuge can only manage 5,000 and that is only with significant help from private partners.¹⁷

These and other reductions in outreach and education programs are combined with numerous other setbacks. The refuge has had to cancel freshwater wetland restoration projects, reduce invasive-plant control, discontinue waterfowl and shorebird surveys and seek private funding for the refuge’s top priority—restoration of the threatened Chinook salmon in the Nisqually watershed.



Chinook salmon | © Tom and Pat Leeson/leesonphoto.com

CAPE MAY

NATIONAL WILDLIFE REFUGE

At high tide, with the full moon glowing on the shoreline of the Delaware Bay, a phenomenal event occurs each May. Crests of approaching waves begin to carry in one of Earth's most ancient living creatures—the horseshoe crab. This estuarine ecosystem, of which Cape May National Wildlife Refuge protects a portion, contains the world's largest spawning ground for horseshoe crabs. Where they gather, so do the shorebirds that sustain themselves on crab eggs during their long journey from as far as South America's Tierra del Fuego to breeding grounds in the Arctic.

Thousands of red knots gather on these beaches, making the protection of this area essential to their long-term survival—especially for the highly imperiled *rufa* subspecies. Red knots are joined by millions of other shorebirds like ruddy turnstones, dowitchers and sanderlings, making this ecosystem an internationally important staging area for shorebird migration and second in North America only to the Copper River Delta in Alaska. So special is this place that it has been recognized by five different national and international entities as a crucial location for birds.

This New Jersey refuge hosts an array of travelers on the Atlantic Flyway, including 100 species of songbirds, such as the wood thrush, ovenbird and northern parula. These neotropical migrants have suffered habitat destruction and fragmentation on both their breeding and wintering grounds, making the protection of migration habitat at this refuge essential. Each fall, Cape May is home to perhaps the greatest spectacle of migrating raptors in the United States, and thousands of visitors descend on the peninsula to witness the steady stream of hawks, eagles and falcons. On a good day, it is possible to see 100 peregrine falcons, 7,000 American kestrels and 150 northern harriers, among many other hawk species. In all, 317 species of birds can be seen here, including the largest concentration of American woodcocks on the Atlantic coast. Beyond birds, there is also a diverse community of 42 mammal species, 55 reptile and amphibian species and many fish, shellfish and other invertebrates.

The goal of the Cape May refuge, established in 1989, is to protect 21,000 acres of upland forest, forested wetland, saltmarsh,

Horseshoe crabs | © Frans Lanting/Minden Pictures



shoreline and grassland. That's nearly double its current 11,000 acres and a tough goal in the Jersey Shore's expensive real estate market—and in a political climate that has starved the refuge system of land acquisition funding. But an even more immediate concern for Cape May has been a lack of funding for staff—law enforcement in particular. Even though the refuge receives 60,000 visitors a year, its meager staff of five includes only one law enforcement officer, who splits his time with another refuge 60 miles away, and it has no visitor center. This lack of presence makes it hard to articulate the importance and fragile nature of this landscape and virtually impossible to police the people who

are illegally plowing through forests and uplands on all-terrain vehicles, tearing up vegetation and soils and disturbing nesting birds and other wildlife. Because the habitat at this refuge is so segmented by roads and private land, it is impossible to stay on top of this problem and protect the biological integrity of the refuge without more law enforcement—the Fish and Wildlife Service's most basic duty at refuges. In fact, the first staffer at the first refuge, Pelican Island, was a game warden. A 2005 comprehensive assessment by the International Association of Chiefs of Police found that refuge law enforcement capability was woefully inadequate,¹⁸ inhibiting the Fish and Wildlife Service's ability to protect public safety and refuge resources—in other words, inhibiting the service's ability to carry out the reforms Congress mandated in the refuge improvement act.



Red knots | © Cliff Beittel

SAN LUIS

NATIONAL WILDLIFE REFUGE

On sprawling marshlands and swaying grasslands at the northern end of the San Joaquin Valley in California, the 130,000-acre San Luis Refuge Complex offers some of the best habitat in the heart of the Pacific Flyway. It's here that migratory birds, including green-winged teal, ring-necked ducks, snow geese and up to 15,000 sandhill cranes, roll in by the hundreds of thousands to rest their tired wings.

Arriving exhausted, many from the northern cap of the Earth, waterfowl here will feed on a bounty that is nearly unknown elsewhere in the state. Today, 95 percent of California's wetlands have been drained, filled or otherwise destroyed.¹⁹ In the Central Valley, a

vast flatland between the Sierra Nevada Mountains and the coastal ranges that rise above the Pacific Ocean, wetlands once spread across 4 million acres. Most of that has been converted to agriculture, but this refuge land was saved for millions of migrant and resident birds, including a quarter of a million sandpipers and many thousands of dunlins, black-necked stilts, herons, egrets, raptors and songbirds. More than 210 species of birds have been seen here, including the least Bell's vireo, which was thought to be extirpated from the Central Valley but recently reappeared. In addition, the refuge harbors many mammals, reptiles and amphibians, including rare species, such as the endangered San Joaquin kit fox and the Tule elk—the smallest elk in North America and nearly exterminated because of habitat loss and overhunting in the early part of the last century.

Sadly, this incredible haven has faced its share of trouble. Within the refuge complex is the site of one of the worst wildlife refuge tragedies in the system's history. The Kesterson refuge became infamous in the 1980s when selenium poisoning from agricultural runoff tainted the refuge's water, killing

birds and causing reproductive problems and birth defects in bird populations. The reservoir at Kesterson was declared toxic in 1987—and was thereafter drained and buried.

Unfortunately, the quality of the water at this refuge is not the only problem. This time the issue is the scarcity of water. The refuge improvement act called on the Fish and

Wildlife Service to ensure adequate water quality and water quantity to meet the refuge system mission. This requirement to provide enough water for the San Luis refuge was further reinforced with the enactment of the Central Valley Project Improvement Act, which makes water available to the refuge provided it can pay for it.



Ross's geese | © Gary Crabbe

However, every year, because of increasing water demands from agricultural and urban development, the San Luis refuge struggles to secure enough water to sustain its wetlands.²⁰ With water supplies dwindling, the cost of water increasing and money in short supply, national wildlife refuges in California face millions of dollars of unfunded needs. San Luis cannot compete on the open market for California's limited water resources, which can be expected to become even scarcer as prolonged drought and global warming run their course. Budget shortfalls have also hindered the refuge's ability to build appropriate infrastructure to deliver what water they have.

The health of San Luis, an anchor of habitat along the Pacific Flyway, depends on availability of water, and in the 1997 law, Congress declared that refuge water quality and quantity must be protected. But as the human population grows and water supplies dwindle, throughout the West wildlife refuges like San Luis and hundreds of sensitive species are facing intense pressure from agriculture and urban areas.

RHODE ISLAND

NATIONAL WILDLIFE REFUGE COMPLEX

As the cliché goes, good things come in small packages. In the tiny state of Rhode Island, on a handful of small parcels of land totaling only about 2,600 acres, a colossal and diverse congregation of wildlife gathers. Among its numbers are species rare, or rarely seen, and also the numerous and conspicuous. In winter, flamboyantly costumed harlequin ducks—daredevils that summer in isolated whitewater rivers and turbulent ocean environs in northern Canada and Alaska—share the Atlantic shoreline with scores of other wildlife, including harbor seals. Male woodcocks perform aerial dances in refuge skies, under the appraising eyes of females. Migrating raptors pepper the sky with bird traffic in fall. Snow buntings, eiders, scoters and loons, yellow-breasted chats and American black ducks, along with some 300 other species of birds, can be found here at the Rhode Island National Wildlife Refuge Complex.

Congress established this cluster of five refuges in the mid-1970s, primarily for birds migrating along the Atlantic Flyway, and it has become a gem in the refuge system. The complex contains some of the most important migratory bird habitat on the East Coast. Nearly half a million people visit Rhode Island wildlife refuges each year to experience a flock of tree swallows passing over like a dark cloud, or to watch thousands of migratory waterfowl at Ninigret Pond, or for the glimpse of a flying squirrel nesting in an aged tree, or perhaps just for a moment of peace away from harried East Coast roads and cities at Rhode Island's last undeveloped coastal ponds.

But all is not well at Rhode Island refuges. Despite Congress's clear direction to prioritize environmental education and other wildlife-dependent recreational uses, years



Rhode Island National Wildlife Refuge Complex | © William H. Johnson

Harlequin ducks | © Gary Kramer/garykramer.net



of inadequate budgets and staffing have steadily eroded the refuges' ability to adequately comply with the mandates of the refuge improvement act. Such a collection of wildlife habitats within close proximity to population centers naturally provides ample opportunity for valuable environmental education, but an extreme budget shortfall for national wildlife refuges in the state has left the refuge system struggling to maintain basic educational programs.²¹ These programs—which bring children from city schools to the refuge to learn of salt ponds, vernal pools and the wildlife dependant on these unique and ever-decreasing habitats—are being slashed and visitor facilities are closing. For many students, these refuge programs are their only introduction and link to the natural world.

Along with the outreach funding crunch, these refuges, like so many others, have long faced declining land acquisition dollars. Funding in the past two years is merely a third of what it was five years ago, making it incredibly difficult to compete in the race against fast-paced, high-dollar developments. Given that the improvement act requires that U.S. ecosystems be conserved by strategically expanding the refuge system, the paltry land acquisition dollars provided by the Bush administration and Congress in recent years have been grossly inadequate and do not fulfill the promise of the 1997 legislation. Though the Rhode Island refuge complex maintains the ultimate goal of protecting approximately 5,000 acres, it currently has managed to cobble together only half of that. Much of the surrounding acreage has already been lost to development, making it all the more important to protect what's left.

CONCLUSION/RECOMMENDATIONS



Bald eagle | © A. & S. Sandy/Vireo

There is perhaps no greater symbol of the significance and success of the National Wildlife Refuge System than the bald eagle. In 2007, the U.S. Fish and Wildlife Service removed this national icon entirely from the endangered species list, a victory in no small part due to protected habitat like the Rappahannock River Valley refuge in Virginia, where dozens of bald eagles find a place to raise their young each year.

By sheltering the bald eagle from extinction, we have secured an opportunity for ourselves to paddle a boat on a quiet river and feel our hearts stop when we see a bird with a 7-foot wingspan gracefully skim the water and then head up to the forest canopy with a meal for its young. There exists no measure of the value of these moments, happening every hour of every day all over this immense nation at more than 545 refuges for wildlife.

But the continued survival of sensitive species such as the bald eagle and the future health of all wild species depend on a consistent and intelligent approach to habitat conservation

and protection. Congress was acutely aware of this fact when it passed the bipartisan legislation in 1997 meant to improve and safeguard the refuge system. To quote the U.S. Fish and Wildlife Service from *Fulfilling the Promise*, its 1999 strategy document for implementing the National Wildlife Refuge System Improvement Act: The “National Wildlife Refuge System is a promise to preserve wildlife and habitat for the benefit of all Americans.”²² It took the refuge improvement act to codify this sentiment into law and volumes of refuge policy to clarify how to implement this noble view. Ten years after passage of this landmark legislation, however, implementation of several key requirements remains inadequate at many of our wildlife refuges. These core values and standards must be vigorously upheld to guarantee that refuges are forever a place where wildlife comes first and that the biological integrity, diversity and environmental health of the refuge system are guaranteed in perpetuity.

To promote better implementation of the goals in the 1997 refuge improvement act, we recommend the following measures:

Ensure refuge uses are compatible with wildlife conservation. Arguably the most important provision of the refuge improvement act is the clear and specific direction that any existing or proposed use of a wildlife refuge is permissible only if found to be compatible with the refuge's original purpose and that of the entire refuge system's mission. This is a standard that is frequently challenged, as is evident at Pea Island and Yukon Flats refuges. The Fish and Wildlife Service should vigorously defend the wildlife and the lands they have been entrusted by the American public to protect and only permit compatible recreational uses that uphold the mandates of the refuge improvement act.

Ensure that the biological integrity of the refuge system is maintained. When Congress required that "the biological integrity, diversity, and environmental health of the [refuge] system" be ensured "for present and future generations of Americans," it was attempting to guard against the state of affairs now ongoing at Cape May, Hailstone, Trempealeau, Lower Rio Grande Valley and other refuges. Unfortunately, the biological integrity at many refuges is severely compromised by grossly inadequate budgets, insufficient staffing, questionable administration policy and other external threats beyond the control of the Fish and Wildlife Service, such as climate change. To fully guard against threats to the biological integrity and environmental health of the refuge system, the Fish and Wildlife Service should: (1) train staff on how to implement the biological integrity policy; (2) host regional workshops on how global warming is affecting refuges and coordinate strategies to address present and future changes; and (3) incorporate an analysis of each refuge's historic and current biological integrity and the actions necessary to restore it into each refuge's long-range comprehensive conservation plan.

Strategically grow the refuge system to fulfill its wildlife conservation mission. In an era of rampant population growth, intensification of agriculture and sprawling development, as is happening near Cape May, Rappahannock River Valley and Lower Rio Grande Valley refuges, the "continued growth of the [refuge] system," as Congress directed, is of utmost importance to "contribute to the conservation of the ecosystems of the United States." Yet, there are essentially no official national priorities to guide the creation of new refuges or the expansion of existing refuges. The Fish and Wildlife Service needs to develop policy guidance that ensures that future acquisitions are nationally significant, safeguards species and habitats currently under-protected by the refuge system and other protected areas and addresses global

warming's impacts on wildlife and habitat. No amount of sound conservation planning will matter, however, if federal land acquisition continues to be starved of funds. The Land and Water Conservation Fund is authorized to receive almost a billion dollars a year from offshore oil- and gas-production royalties and other sources, yet this money, dedicated to conservation purposes as a trade-off for development of federal offshore oil and gas reserves, has only been fully funded by Congress once in the program's more-than-40-year history. Congress and the administration must work to ensure that these funds are spent on the conservation purposes they were designed for, including refuge land acquisition.

Ensure the refuge system has the water it needs to achieve its wildlife conservation mission. The refuge improvement act was firm and clear regarding water usage when it stated that "adequate water quantity and water quality" must be maintained to "fulfill the mission of the system and the purposes of each refuge." Given the rising demand for water for agricultural and urban use, such as at San Luis refuge, at a time when many areas of the country are warming and more drought-prone, refuges and their wildlife are too often the losers in the battle for water rights. However, Congress and the American people have directed and entrusted the Fish and Wildlife Service to administer the refuge system to conserve and restore wildlife and its habitat for all Americans. As part of this mandate, the agency should develop policy guidance for refuge managers and vigorously advocate for its legal right to secure adequate water for refuge lands.

Prioritize wildlife-dependent recreational uses. A unique provision in the 1997 legislation appropriately prioritizes wildlife-dependent recreational uses above all others. These include environmental education and interpretation, wildlife observation and photography, and fishing and hunting. It also demands "priority consideration in refuge planning and management." In recent years, woefully inadequate budgets have forced the planned downsizing of refuge system staff by 20 percent and have led some refuges to literally close their doors and lock their gates. These budget and staffing cuts are taking their toll at refuges such as Nisqually and the Rhode Island complex, as children and other members of the interested public are being turned away from educational and interpretive wildlife programs. Congress and the administration should restore the lost outdoor recreation specialists and environmental educators who have been lost due to budget cuts. In addition, the Fish and Wildlife Service should take care that expansion of recreational and educational uses does not negatively impact the very wildlife the public wants and deserves to enjoy.

ENDNOTES

1. U.S. Fish and Wildlife Service. "Banking on Nature 2004: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation."
2. Alaska Maritime National Wildlife Refuge "Contaminant Legacy – Amchitka Island." <http://alaska.fws.gov/nwr/akmar/whatwedo/bioprojects/restorebiodiversity/contaminants/contamchitka.htm> (June 2007).
3. United States General Accounting Office. "National Wildlife Refuges: Continuing Problems with Incompatible Uses Call for Bold Action." September, 1989.
4. Cooperative Alliance for Refuge Enhancement. "Restoring America's Wildlife Legacy 2007." Washington D.C., 2007.
5. North Carolina Department of Transportation. *Bonner Bridge Update, no. 3* (February 2007).
6. *Ibid.*
7. U.S. Fish and Wildlife Service. Rappahannock National Wildlife Refuge brochure, and conversation with Joe McCauley, U.S. Fish and Wildlife Service. June 2007.
8. U.S. Census Bureau, 2000.
9. Personal communication with Nancy Brown, U.S. Fish and Wildlife Service, Lower Rio Grande Valley National Wildlife Refuge, June 2007.
10. M. Reisner, *Cadillac Desert: The American West and its Disappearing Water*. Penguin Books, New York, 1986.
11. Personal communication with Barron Crawford, U.S. Fish and Wildlife Service, Hailstone National Wildlife Refuge. June 2007.
12. Associated Press. "Tainted Soil to Be Removed from Wildlife Preserve." August 17, 1987.
13. Personal communication with Victoria Hirschboeck, U.S. Fish and Wildlife Service, Trempealeau National Wildlife Refuge. June 2007.
14. Personal communication with Michael Lusk, National Invasive Species Coordinator for the National Wildlife Refuge System. June 2007.
15. U.S. Fish and Wildlife Service. "Wisconsin: National Wildlife Refuge System Workforce Planning." 2007.
16. Personal communication with Jean Takekawa, Nisqually National Wildlife Refuge. June 2007.
17. *Ibid.*
18. The International Association of Chiefs of Police. *A Deployment Model for the National Wildlife Refuge System* (May 2005).
19. California Department of Fish and Game; available from http://ceres.ca.gov/ceres/calweb/DU/Valley_Habitats3.html; Internet; accessed 5 September 2007.
20. Personal communication with Kim Delfino, Defenders of Wildlife California office. June 2007.
21. Cooperative Alliance for Refuge Enhancement. "National Wildlife Refuges: Rhode Island Funding Crisis." 2007.
22. U.S. Fish and Wildlife Service. *Fulfilling the Promise: The National Wildlife Refuge System* (March, 1999).



DEFENDERS OF WILDLIFE
1130 17th Street, N.W.
Washington, D.C. 20036-4604
202.682.9400
www.defenders.org