



U.S. Fish & Wildlife Service

National Wildlife Refuge System

Overview



Photo: USFWS



Photo: USFWS/Laura Beauregard

The U.S. Fish and Wildlife Service is the premier government agency dedicated to the conservation, protection and enhancement of fish, wildlife and plants, and their habitats. The Service also helps ensure a healthy environment for people by protecting such ecosystem services as clean air and water.

Since President Theodore Roosevelt designated Florida's Pelican Island as the first wildlife refuge in 1903, the National Wildlife Refuge System has grown to include more than 560 refuges, 38 wetland management districts and other protected areas encompassing 150 million acres of land and water from the Caribbean to the remote Pacific. There is at least one national wildlife refuge in every state and territory and within an hour's drive of most major metropolitan areas.

National wildlife refuges provide habitat for more than 700 species of birds, 220 species of mammals, 250 reptile and amphibian species and more than 1,000 species of fish. More than 380 threatened or endangered plants or animals are protected on wildlife refuges. Each year, millions of migrating birds use refuges as stepping stones while they fly thousands of miles between their summer and winter homes.

The National Wildlife Refuge System Improvement Act of 1997 outlined the fundamental conservation mission of the Refuge System, but also identified six areas of wildlife-dependent recreation as appropriate on refuges:

- Hunting and Fishing
- Wildlife Observation and Photography
- Environmental Education and Interpretation

The Service is working to meet such conservation challenges as:

- Urban encroachment
- Landscape-level conservation to combat habitat fragmentation
- Degradation of water quality
- Climate change
- Increasing demands for energy development and extraction

U.S. Fish & Wildlife Service
<http://www.fws.gov/refuges>

November 2013

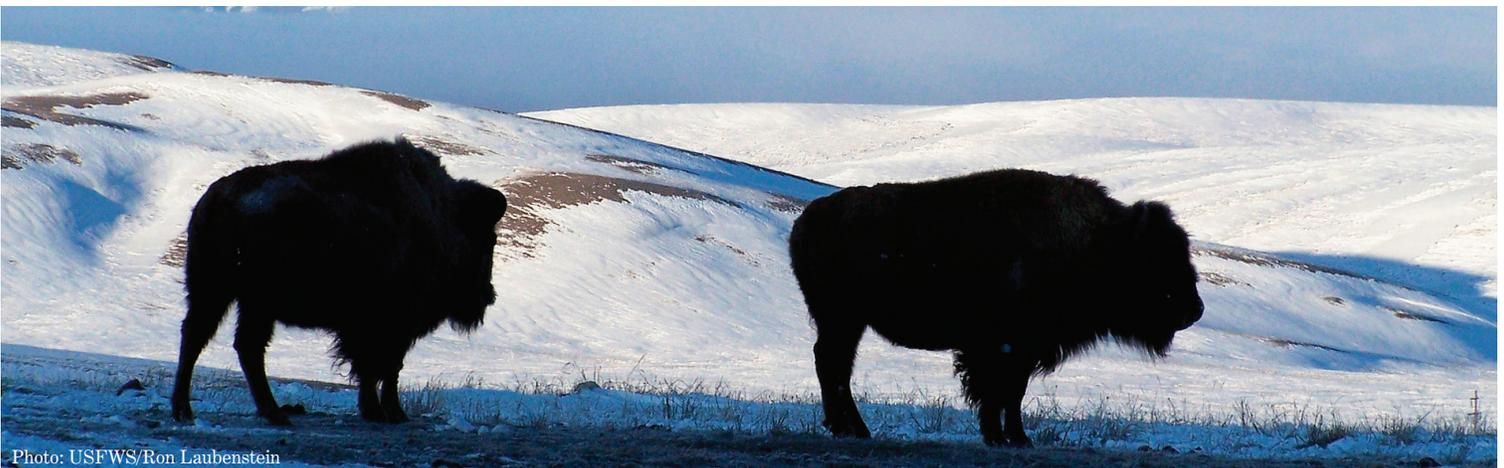


Photo: USFWS/Ron Laubenstein



National Wildlife Refuge System

Recreation

For boundless opportunities to discover nature in all its splendor, national wildlife refuges are unsurpassed. From all parts of the globe, more than 47 million visitors flock to these natural treasure troves each year.

The National Wildlife Refuge System's extensive trails, auto tour routes, boardwalks, observation decks, hunting and photography blinds, fishing piers and boat launches offer great opportunities to learn and have fun.

Hunting and Fishing

Hunters are welcome on more than 360 units of the Refuge System, while anglers can fish more than 300 Refuge System units. These sports enthusiasts first sounded the alarm about the dangers facing fish and wildlife, ultimately forming some conservation organizations that helped pass legislation to protect wildlife and establish many national wildlife refuges.

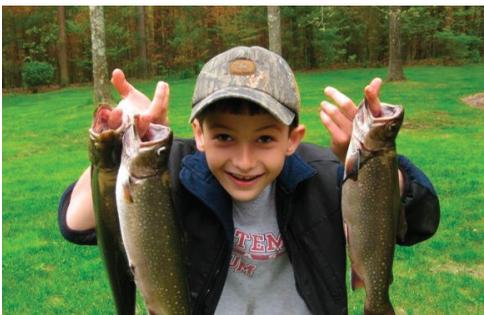


Photo: USFWS

The online *Guide to Hunting on National Wildlife Refuges* (<http://www.fws.gov/refuges/hunting/>) zeroes in on the perfect hunt by species (deer, big game, exotics, waterfowl, turkey, upland or migratory birds, small game), state or specialty (universally accessible or designed for youth). The *Guide to Fishing on National Wildlife Refuges* (<http://www.fws.gov/refuges/fishingguide/>) describes every type of fishing opportunity, from inconnu and

grayling in remote Alaska to snook hovering by mangroves in Florida. The guides also include information on state licenses and the most up-to-date refuge-specific hunting and sport fishing regulations.

Trails and Auto Routes

Refuges welcome visitors on foot or wheel. Many trails on refuges are nationally designated for their scenery, history or recreational value. Find trails by state or level of difficulty at www.fws.gov/refuges under Visitors and Trails. Bring a smartphone to J.N. "Ding" Darling National Wildlife Refuge in Florida to link to videos while you are walking the iNature trail or listening to cellphone messages along the auto tour at Upper Mississippi National Fish and Wildlife Refuge.

Wildlife Observation and Photography

Birdwatchers, wildlife observers and photographers are awed by unbelievable congregations of birds on refuges, numbering in the tens of thousands during peak migration, as well as opportunities to view single dragonflies, nesting plovers and bald eagles, manatees and herds of caribou, or the exotic mating rituals of grebes or prairie chickens. Nature trails, observation decks and photo blinds provide superb vantage points for some of the best wildlife viewing opportunities in the world.

Special events like the Festival of the Cranes at Bosque Del Apache National Wildlife Refuge in New Mexico celebrate the best moments to view particular species in all their magnificence. Herds of bison still graze the grasslands at

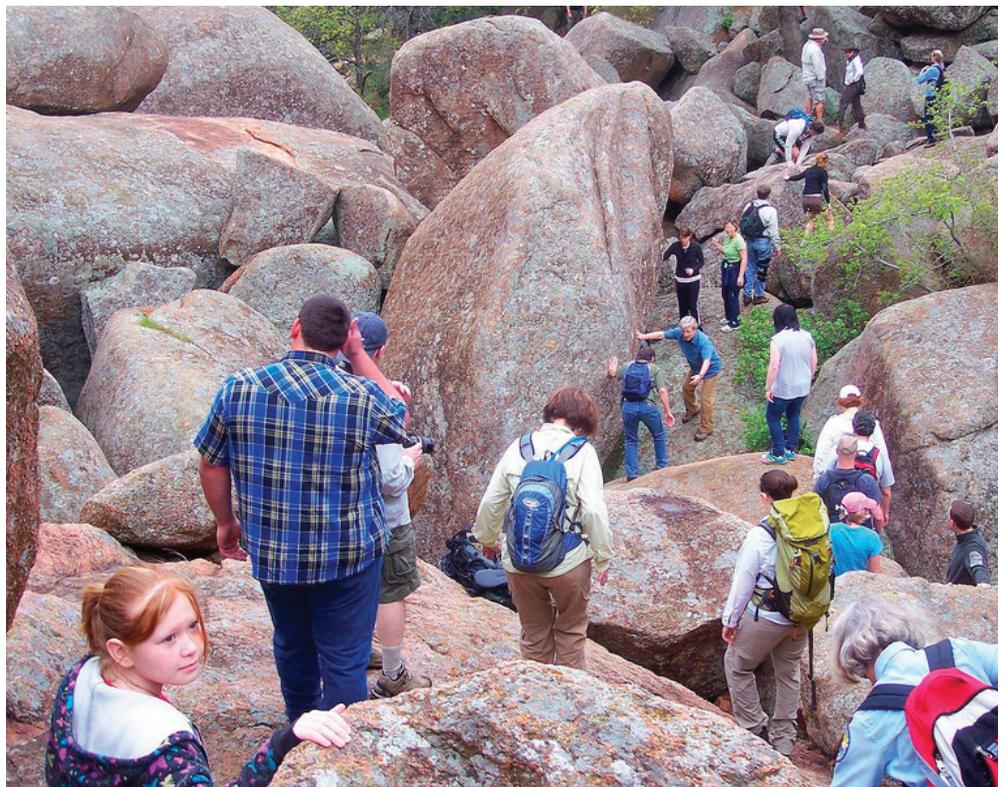


Photo: USFWS/David Smith

National Bison Range in Montana, Fort Niobrara National Wildlife Refuge in Nebraska and the Wichita Mountains National Wildlife Refuge in Oklahoma. The Archie Carr National Wildlife Refuge in Florida is the sea turtle capital of the western hemisphere. Giant brown bears congregate each summer at Kodiak National Wildlife Refuge in Alaska when the sockeye salmon are spawning.

Environmental Education and Interpretation

National wildlife refuges offer a full menu of educational activities for school and community groups, families and individuals (See the Special Events calendar under Visitors at www.fws.gov/refuges.) Many refuges have visitor centers with interactive exhibits. Some lend binoculars or backpacks filled with guides and tools to enhance a refuge visit. Others offer cultural and historical sites, often with special programming, like the Chesser Island Homestead Open House at Okefenokee National Wildlife Refuge in Georgia or the former African-American maroon communities at Great Dismal Swamp National Wildlife Refuge in Virginia.

Water Sports

Whether you navigate on your own or take a guided trip, bring your own boat or rent one, many refuges make wonderful paddling destinations. The Refuge System boasts some 1,000 miles of marked water trails, from the calm waters of Black Bayou Lake National Wildlife Refuge in Louisiana to the strenuous 80-mile water route through Kenai National Wildlife Refuge in Alaska.

Wilderness

Wilderness visitors may hunt, fish, and observe and photograph wildlife, when these activities are compatible with the refuge's primary mission of wildlife conservation. Many other types of compatible recreational uses, such as cross-country skiing, canoeing, kayaking, and hiking may also be enjoyed in some wilderness areas. There are 75 wilderness areas on 63 units of the Refuge System in 26 states.

Plan to play at a national wildlife refuge – find one near your home or travel destination at [fws.gov/refuges](http://www.fws.gov/refuges).



Photo: USFWS

U.S. Fish & Wildlife Service
<http://www.fws.gov/refuges>

March 2015



U.S. Fish & Wildlife Service

Learn About Wilderness

National Wildlife Refuge System



Mingo National Wildlife Refuge, MO/Vergial Harp/USFWS



Cape Romain National Wildlife Refuge, SC/Jannah Dupre



Fort Niobrara National Wildlife Refuge, NE/Chuck Melvin

The Wilderness Act of 1964 established the National Wilderness Preservation System. Today that system includes 757 Congressionally designated wilderness areas comprising about 109.5 million acres in 44 states and Puerto Rico.

The U.S. Fish and Wildlife Service is one of four federal agencies with stewardship of designated wilderness. The others are the Bureau of Land Management, the U.S. Forest Service and the National Park Service.

The U.S. Fish and Wildlife Service manages more than 20 million acres of designated wilderness in the National Wildlife Refuge System – about one-fifth of all the designated wilderness areas in the nation. There are 75 wilderness areas on 63 units of the Refuge System in 25 states. About 90 percent of Refuge System wilderness acreage is in Alaska. The U.S. Fish and Wildlife Services also manages one other wilderness area – at Leadville National Fish Hatchery in Colorado.

The Wilderness Act of 1964 – which was passed by Congress and signed by President Lyndon B. Johnson – includes this definition:

“A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions ...”

For More Information

National Wildlife Refuge System Wilderness page
<http://www.fws.gov/refuges/whm/wilderness.html>

Wilderness.net
(an interagency database for wilderness information)
<http://www.wilderness.net/>

U.S. Fish & Wildlife Service
<http://www.fws.gov/>

National Wildlife Refuges With at Least One Wilderness Area

Alaska

Alaska Maritime
Arctic
Becharof
Innoko
Izembek
Kenai
Koyukuk
Selawik
Togiak
Yukon

Arizona

Cabeza Prieta
Havasu (partially in California)
Imperial (partially in California)
Kofa

Arkansas

Big Lake

California

Farallon
Havasu (partially in Arizona)
Imperial (partially in Arizona)

Florida

Cedar Keys
Chassahowitzka
Great White Heron
Island Bay
J.N. "Ding" Darling
Key West
Lake Woodruff
National Key Deer Refuge
Passage Key
Pelican Island
St. Marks

Georgia

Blackbeard Island
Okefenokee
Wolf Island

Illinois

Crab Orchard

Louisiana

Breton
Lacassine

Maine

Moosehorn

Massachusetts

Monomoy

Michigan

Huron
Michigan Islands
Seney

Minnesota

Agassiz
Tamarac

Missouri

Mingo

Montana

Medicine Lake
Red Rock Lakes
UL Bend

Nebraska

Fort Niobrara

New Jersey

Edwin B. Forsythe
Great Swamp

New Mexico

Bitter Lake
Bosque del Apache

North Carolina

Swanquarter

North Dakota

Chase Lake
Lostwood

Ohio

West Sister Island

Oklahoma

Wichita Mountains

Oregon

Oregon Islands
Three Arch Rocks

South Carolina

Cape Romain

Washington

Copalis
Flattery Rocks
Quillayute Needles
San Juan Islands

Wisconsin

Gravel Island
Green Bay



Fish and Aquatic Conservation

About Us

For over 140 years, the U.S. Fish and Wildlife Service has been a partner on the American landscape in the conservation and restoration of our nation's aquatic resources. Since its inception as the United States Commission on Fish and Fisheries, the Service has worked collaboratively with tribes, states, landowners, partners and stakeholders to achieve the goals of healthy, self-sustaining populations of fish and other aquatic species and the conservation or restoration of their habitats. The Service conducts this work to ensure the health of our nation's aquatic ecosystems and to enable Americans to realize the ecological, recreational and economic benefits provided by these critically important resources.

The Service's aquatic conservation work is carried out by a dedicated and highly skilled workforce of more than 700 employees nationwide. FAC staff maintain and operate a national Headquarters Office, 8 Regional Offices, 72 National Fish Hatcheries, a Historic National Fish Hatchery, 9 Fish Health Centers, 7 Fish Technology Centers, the Aquatic Animal Drug Approval Partnership, and 65 Fish and Wildlife Conservation Offices. The FAC program, in close collaboration with other federal agencies, tribes, states, landowners, partners and stakeholders, strives to conserve, restore and enhance aquatic species and their habitats, prevent and control the spread of aquatic invasive species, and connect the public to America's great outdoors.

We focus our work on geographic areas and species with the greatest needs. It involves understanding and lessening threats to aquatic resources, preventing the introduction of aquatic invasive species, and working to improve habitat, and restoring connectivity of the Nation's streams and rivers.

Mission

We work with our partners and engage the public, using a science-based approach, to conserve, restore and enhance fish and other aquatic resources for the continuing benefit of the American people.

Vision

The Fish and Aquatic Conservation program will be a national leader in achieving sustainable populations of fish and other aquatic species and conserving and restoring their habitats for the benefit of current and future generations.

Alligator River

National Wildlife Refuge



photo: USFWS



photo: USFWS



photo: USFWS



photo: USFWS

Mike Bryant, Refuge Manager
Alligator River NWR
P. O. Box 1969
708 North Highway 64
Manteo, NC 27954
Phone: 252/473 1131
Fax: 252/473 1668
E-mail: alligatorriver@fws.gov

Refuge Facts

- Established: March 14, 1984.
- Size: 153,000 acres lying on the mainland portions of Dare and Hyde Counties, North Carolina.
- Location: 15 miles west of Manteo, NC on US Highways 64 and 264.
- Roughly 28 miles north to south and 15 miles east to west.
- Bordered on the west by the Alligator River and the Intracoastal Waterway; on the north by Albemarle Sound; on the east by Croatan and Pamlico Sounds; and on the south by Long Shoal River and corporate farmland.
- Lead Refuge in NC Coastal Plain Refuges Complex, which includes Alligator River, Pea Island, Pocosin Lakes, Mackay Island, Currituck, and Roanoke River National Wildlife Refuges.
- Comprehensive Conservation Plan was completed June 8, 2007.

Natural History

- Established to preserve and protect a unique wetland habitat type “the pocosin” and its associated wildlife species.
- First ever attempt to re-establish a species (the red wolf) that was extinct in the wild.
- Diversity of habitat types including high and low pocosin, bogs, fresh and brackish water marshes, hardwood swamps, and Atlantic white cedar swamps.
- Plant species include pitcher plants and sun dews, low bush cranberries, bays, Atlantic white cedar, pond pine, gums, red maple, and a wide variety of herbaceous and shrub species common to the East Coast.
- One of the last remaining strongholds for black bear on the Eastern seaboard.

- Concentrations of ducks, geese, and swans; wildlife diversity includes wading birds, shorebirds, raptors, black bears, American alligators, white-tailed deer, raccoons, rabbits, quail, river otters, red wolves, red-cockaded woodpeckers, and neotropical migrants.

Financial Impact of Refuge

- 29-person staff (includes Alligator River and Pea Island, Fire Program, and Red Wolf Recovery Program).
- 62,000 visitors annually.
- Current budget (FY 07) \$3,521,000 (includes Alligator River and Pea Island National Wildlife Refuges, Fire Program, and Red Wolf Recovery Program).
- Attracts visitors worldwide for Red Wolf Howling programs.
- Serves as a “gateway” to other eastern North Carolina refuges, encouraging visitors to venture inland into the counties with fewer economic advantages.

Refuge Goals

- Inventory, protect, and manage to maintain healthy and viable populations of threatened and endangered species (e.g., red wolf and red-cockaded woodpecker), other priority wildlife (migratory birds and black bear), and fish.
- Inventory and manage to provide diverse, high quality mid-Atlantic Coastal Plain forested wetlands, marshes, aquatic habitats, and areas intensively managed for wildlife.
- Provide safe, quality wildlife-dependent recreation opportunities for people to learn about and enjoy the wildlife resources and habitats of the refuge and of the National Wildlife Refuge.
- Limit the adverse impacts of development to refuge resources and allow natural processes to dominate on candidate wilderness areas.

Management Tools

- Restoration of historic water levels altered by past logging and farming operations.
- Water management for waterfowl, shorebirds, wading birds, and other wildlife.
- Moist soil management for waterfowl, shorebirds, and wading birds.
- Atlantic white cedar restoration.
- Approximately 2,500 acres of cooperative farming for black bears, red wolves, and waterfowl.
- Wildlife and habitat surveys.
- Red wolf re-establishment.
- Prescribed burning and wildfire suppression.
- Mechanical/chemical control of invasive plants.
- Deer, small game, and waterfowl hunting.
- Environmental education.
- Wildlife interpretation.
- Outreach.
- Law enforcement.
- Partnerships.

Public Use Opportunities

- Universally-accessible foot trails and fishing dock.
- Auto tour route (11 miles).
- Paddling trails (15 miles).
- Wildlife observation and photography.
- Hunting and fishing.
- Guided interpretive programs, including Red Wolf Howlings, Bear and Wolf talks and Canoe Tours (fee program).
- Environmental education.

Calendar of Events

April-December: Red Wolf Howlings.

April: Earth Day, National Wildlife Week, scheduled canoe tours (fee program).

May: International Migratory Bird Day.

June-August: Summer Programs, scheduled canoe tours (fee program).

September: dove season, bow season for deer.

October: National Wildlife Refuge Week; Howl-O-Ween Howlings; primitive weapon and conventional weapon hunting for deer, raccoon, squirrel, waterfowl, and opossum.

November: Wings Over Water, conventional hunting for quail, snipe, and rabbit.

Questions and Answers

What can I do to help Alligator River National Wildlife Refuge?

You can help this refuge by volunteering your time as a volunteer, donating your money to the Coastal Wildlife Refuge Society (the refuge non-profit support group), and by being a good steward for natural resources. Contact the Society (<http://www.fws.gov/alligatorriver/cwrs.html>)! They'll tell you all kinds of ways you can help!

Alligator River Refuge uses volunteers in a variety of program areas. Local volunteers work regularly staffing the Visitor Center, maintaining interpretive trails, putting up signs, conducting interpretive tours, and assisting with biological and maintenance work. We also have programs for interns and resident volunteers.

Why do you start fires on the refuge?

Fire is a natural process. Much of the refuge is pocosin habitat, which typically has a natural fire cycle of three to seven years. Native Americans were known to set fires to aid in hunting game and to promote better access to the woods and marshes. Frequent fires had the effect of pruning back the thickets of shrubs and canes; consuming accumulations of dead grasses, pine litter, and woody debris; and recycling nutrients into the soil. The results were more open conditions in the marshes and woodlands and very diverse and productive wildlife habitats.

FWS "starts fires on the refuge" to reduce hazardous fuel conditions and to mimic the natural fires of the past. Many plant species, such as pond pine, are fire dependent and

need fire to reseed and maintain a healthy stand. The FWS fires are accomplished under "prescribed" conditions in which they can be managed safely to burn out the accumulation of forest litter and shrubs.

Why is the Fish and Wildlife Service introducing the red wolf, a predator, into eastern North Carolina?

The endangered red wolf once ranged throughout the Southeast, but now it is threatened with extinction. By the late 1970's, the red wolf was extinct in the wild, with only a few captive wolves surviving in zoos. Eastern North Carolina was once part of the red wolf's historic habitat, and may again be able to provide the conditions necessary for its survival. At present, there are 100-130 red wolves in the wild in North Carolina.

Also, if mega-fauna, such as wolves, are able to survive and reproduce within an ecosystem, that provides us with an excellent indication of environmental quality. Predators, like the red wolf, help maintain balance in an ecosystem by controlling populations of prey species and removing unhealthy animals.

Where can I go to see a wolf or bear?

The chances of seeing a wolf are slim. During some seasons, bear may be observed with some regularity. Weekly, during the summer, a guided "Bear Necessities" program begins at Creef Cut Trailhead on U.S. 64 in East Lake. Participants receive an orientation to the refuge and its management programs and have an opportunity to drive along the refuge wildlife drive to see black bears, owls, and other wildlife. A ride down Milltail Road near sunset will often produce bear sightings.

Back Bay

National Wildlife Refuge

Back Bay is one of over 550 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages National Fish Hatcheries, and provides Federal leadership in habitat protection, fish and wildlife research, technical assistance and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

Loggerhead Sea Turtle Hatchling
USFWS

**Back Bay National Wildlife Refuge
Headquarters and Mailing Address**
1324 Sandbridge Road
Virginia Beach, VA 23456-4028

Visitor Contact Station
4005 Sandpiper Road
Virginia Beach, VA 23456-4325

757/721 7329
<http://www.fws.gov/backbay/>

Federal Relay Service
for the deaf and hard-of-hearing
1 800/877 8339

U.S. Fish & Wildlife Service
1 800/344 WILD
<http://www.fws.gov/>

August 2011



**A Unique Area
for Wildlife**

Welcome to Back Bay National Wildlife Refuge (NWR). Located in the southeastern corner of Virginia, Back Bay NWR was established by Presidential Proclamation in 1938 to provide habitat for migrating and wintering waterfowl, particularly greater snow geese. Today, the refuge continues to be an important link in the chain of national wildlife refuges located along the Atlantic Flyway.



This blue goose, designed by J.N. Ding Darling, has become the symbol of the National Wildlife Refuge System.

Back Bay NWR contains more than 9,100 acres of land, situated on and around a thin strip of coastline typical of barrier islands found along the Atlantic and Gulf coasts. Habitats include beach, dunes, woodlands, farm fields and marshes. The majority of refuge marshlands are on islands contained within the waters of Back Bay. To assure long-term protection for waterfowl and other wetland-dependant species, the U.S. Fish and Wildlife Service is working to acquire additional wetland habitat in the Back Bay area.

Approximately 10,000 snow geese and a large variety of ducks and other waterfowl visit Back Bay NWR during the annual peak migration, usually in December and January. The refuge also provides habitat for a wide assortment of other wildlife, including threatened and endangered species such as loggerhead sea turtles and piping plovers.



USFWS

*Loggerhead Sea
Turtle*



Surf Fishing
S. Bottorf

A Haven for Waterfowl and Other Wildlife

More than 300 species of birds have been observed at Back Bay NWR. During the fall and winter months, large flocks of waterfowl use the Bay and freshwater impoundments. Snow and Canada geese, tundra swan, and many duck species are abundant. Each year, waterfowl numbers rise and fall in response to weather conditions, farming practices, and reproductive success. Migrating songbirds and shorebirds arrive at the refuge each spring. Brightly colored warblers dot shrub and woodland areas while shorebirds line the intertidal zone and search for food in shallow waters.



R. Harris

Great Egret

The varied habitats at Back Bay NWR provide food and cover for mammals such as river otters, white tailed deer, mink, opossums, raccoons, and the red and grey fox.

Many types of reptiles and amphibians occur at Back Bay NWR. Snakes, including poisonous cottonmouths, are frequently seen. Other common snakes include brown and northern water snakes, black rat snakes and eastern hognose snakes. On warm, sunny days, turtles line up on logs and bask at the water's edge. Red-bellied, painted, eastern mud, and snapping turtles are most common.



USFWS

Cottonmouth snake

White-tailed deer



D. Dewherst

Non-native Species

Non-native species include feral pigs and nutria. These animals compete with native species for food and cover, and contribute to negative impacts to the managed environment. Pigs uproot valuable marsh vegetation and nutria damage dikes through burrowing activity.

An Area of Diverse Habitats

Back Bay NWR habitats support a wide variety of plant and animal life. Seventy-five percent of the refuge is marshlands found within several large impoundments and on the Bay islands. These productive, protected marshlands contain valuable wildlife food plants such as three square, smartweed, and spike rushes.

The shifting sands of the barrier beach are constantly exposed to ocean waves, currents, and tides. No vegetation can withstand these powerful forces, but ghost crabs, gulls, and migrating shorebirds are common here. Sand dunes form a line of defense, protecting marshes and woodlands from high tides and storms. Like the beach, the dunes are exposed to the powerful forces of nature. However, dunes are able to support vegetation that helps to stabilize the sandy soil.



USFWS

Ghost Crab

Wax myrtle, highbush blueberry, bayberry, wild black cherry, and persimmon dominate refuge shrublands. Woodlands consist mostly of live oak and loblolly pines. Shrubland and woodland habitats are found in areas of higher elevation, where the soil is well drained and the

harsh effects of the ocean are not as dramatic. Raptors, rabbits, squirrels, and deer are commonly found here.



D. Dewherst

Gulls

Edges between major habitats, such as between land and sea, are places where wildlife is most active. In fact, coastal barrier habitats are thought to harbor a greater variety of bird species than any other ecosystem in the continental United States. In many cases, this diversity occurs within an extremely narrow area. At the refuge, for instance, the distance to the ocean from Back Bay is no more than one mile.

R. Harris



Osprey

Management Improves Habitat

Wildlife managers constantly work to improve the quality of wildlife habitat. Although refuge marshes have a natural appearance, most areas are intensively managed for use by waterfowl and other native wildlife. Management actions create diverse habitats to encourage use by many wildlife species.

Habitat management at Back Bay NWR includes water level manipulation, prescribed burning, plowing, discing, dike construction, chemical control, wildlife population control, and seasonal closures to protect various species. As you travel through the refuge you will see how habitats have been modified. Look for burned areas, water control structures, signed or cabled closed areas, and marsh areas that have been deliberately disturbed to prevent woody plant growth. Waterfowl, especially, thrive on marshes containing succulent plant growth with few upland species.



Visitor Contact Station

Wildlife and Seasonal Happenings



C. Marshall

Environmental Education

Winter - Wintering waterfowl congregate on the refuge. Winter storms and cold fronts may bring increased numbers of birds to the area. Rafts and long lines of pelagic (oceanic) birds can be observed along the beach. Northern harriers are abundant as they search for food in the marsh. Deer shed their antlers and breed through February.

Spring - Local breeding ducks pair off and nest. Broods are visible by early May. Ospreys return in early March and begin using refuge nesting platforms. By May, white-tailed deer fawns appear and rare orchids and carnivorous plants bloom in the marsh and in ditches along refuge dikes. Songbird and shorebird migration peaks during this period.

Summer - Ospreys are hatching, along with songbirds. Sea turtles nest at night on the beach. Wading birds concentrate in the marsh. Blackberries and blueberries provide food for songbirds and marsh hibiscus (rose mallow) blooms along marsh edges. Ticks, chiggers, and other biting insects are abundant.

Fall - Migratory waterfowl begin moving through the area. Ospreys, swallows, and songbirds depart for their wintering grounds. Peregrine falcons hunt shorebirds along the beach and other raptors pass through as they migrate southward. Reptiles, amphibians, and insects become less active.

Visitor Activities

More than 120,000 people visit Back Bay NWR each year. They come to enjoy the unique beauty of the area, to learn about wildlife, and to participate in environmental education and wildlife-dependent recreation. The following facilities and activities are provided for visitors:

Visitor Contact Station - Displays, brochures, and films are available. Refuge staff are also available for visitor questions and comments.

Foot Trails - Two boardwalk trails lead to the beach. The Bay Trail, Kuralt Trail, and portions of the interior dikes are also open to visitors on foot.

Wildlife viewing/photography - Viewing stations abound throughout the refuge providing ideal opportunities for wildlife observation and photography.

Fishing - Surf and freshwater fishing are permitted in specific areas. A Virginia fishing license is required for fresh and salt water fishing.

Boating - Small boats and canoes that can be hand-carried to the Bay's edge are allowed. No launching facilities are available for large boats. Trailers are not permitted.

Bicycling - The East and West dikes are alternately open to bicylists on a seasonal basis. Both dikes close for wildlife protection from November through March.

Hunting - Available by permit during designated periods. Contact the refuge for details.

Volunteer Program - Back Bay NWR hosts volunteers in many activities. By becoming a refuge volunteer you too can contribute to conserving America's wildlife heritage.

Educational Programs - Organized school, civic, and professional groups may reserve dates for talks, audiovisual programs, and outdoor classroom activities. Public interpretive programs are regularly scheduled. Contact the refuge for more information.

Tram tours - The refuge's seasonal "Blue Goose Express" open-air tram provides visitors with a guided interpretive tour through the refuge impoundments and False Cape State Park.



caption?

Regulations Protect Visitors and Wildlife



Refuge regulations exist for your safety and for the welfare of wildlife. Visitors are expected to know and comply with all regulations. Please observe all posted signs when visiting the refuge. A complete listing of regulations can be obtained by contacting the refuge office.

Listed below are a few regulations that you should know about before you visit:

A refuge entrance fee is required from April 1 through October 31. No entrance fee is required for the remainder of the year.

Public entry to the refuge is permitted during daylight hours only.

Only wildlife-dependent recreation is permitted. Swimming, sunbathing, and surfing are not allowed.

Visitors may not park cars overnight. Entry into closed areas, including the dunes, is prohibited.

Groups of more than ten people must obtain a refuge permit before their visit.

To avoid conflicts with wildlife, and for visitor safety, pets are not allowed on the refuge at any time.

Open fires, including charcoal-burning grills, are prohibited.

Public vehicle access on the refuge beach or impoundments is not permitted.

Vehicles are permitted no further than the Visitor Contact Station. Access beyond this point must be by foot, bicycle, or tram. Congress has mandated that certain residents of North Carolina be permitted to drive vehicles on the beach. Limited administrative vehicle access also occurs by refuge permit.

Refuge Hours

Visitor Contact Station:
Open 8:00 am to 4:00 pm on weekdays, 9:00 am to 4:00 pm weekends. Closed Sundays, November through March. Closed holidays except Memorial Day, July 4, and Labor Day.

Outdoor trails are open daily, 1/2 hour before sunrise - 1/2 after sunset.



Green winged teal



Caribbean Ecological Services Field Office

The Caribbean Ecological Services Field Office was established in 1974. We strive for ecosystem sustainability through preservation, conservation, enhancement, and restoration of habitats essential for the long-term viability of the fish, wildlife, and plants in the Caribbean.

The field office emphasizes an ecosystem approach incorporating Strategic Habitat Conservation to address and prioritize habitat issues through partnerships with other federal, state and local agencies, conservation organizations, private landowners, and citizens to achieve the greatest possible benefits to fish and wildlife. We promote healthy wildlife and their habitat through a diverse group of programs: Endangered Species, Partners for Fish and Wildlife, Contaminants Program, Coastal Program and Project Evaluation.

Station goals

- Promote strategic conservation to protect, conserve and enhance wildlife and ecosystems
- Work cooperatively with private landowners to restore and protect wildlife habitat
- Protect endangered species through the administration of the Endangered Species Act (ESA) in cooperation with other federal agencies, commonwealth and territorial agencies and nongovernmental organizations
- Manage the Puerto Rican Parrot Recovery Program and lead the interagency working group
- Conserve wildlife and wetland resources by evaluating and recommending modifications of projects proposed for Federal construction, funding or authorization
- Evaluate impacts of contaminants on trust resources and aid in remediation of impacts and restoration of habitats and resources
- Develop partnerships with federal, commonwealth and territorial agencies, organizations and citizen groups to understand climate change impacts on fish and wildlife resources and their habitats
- Assist private entities, U.S. Virgin Island and Puerto Rico governments to evaluate and address potential impacts to wildlife from energy projects, including natural gas pipeline

Great Dismal Swamp
National Wildlife Refuge
3100 Desert Road
Suffolk, VA 23434
757/986 3705
757/986 2353 Fax
www.fws/northeast/greatdismalswamp

Federal Relay Service
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September 2008



U.S. Fish & Wildlife Service

Great Dismal Swamp

*National Wildlife
Refuge*

American black bear
P. Cuffee/USFWS



*A gift to the
American
people —
forever.*

A Unique and Mysterious Place



This blue goose, designed by J.N. “Ding” Darling, has become the symbol of the National Wildlife Refuge System.

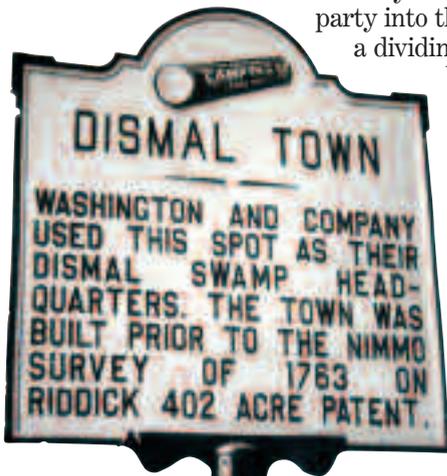
Amazing Rich History of Human Involvement

Welcome to Great Dismal Swamp National Wildlife Refuge. Grassroots efforts to protect the swamp were rewarded in 1973 when the Union Camp Corporation donated 49,100 acres of land to The Nature Conservancy. The land was then transferred to the Department of the Interior, and the refuge was officially established the next year.

Located within a two hour drive to 1.6 million residents of southeastern Virginia and northeastern North Carolina, the Great Dismal Swamp National Wildlife Refuge is a marvelous place to connect with nature. With more than 111,200 acres of seasonally flooded wetland forest and the 3,100 acre Lake Drummond at its center, the refuge contains some of the most important wildlife habitat in the mid-Atlantic region.

Human occupation of the Great Dismal Swamp dates back some 13,000 years. By 1650, the area was inhabited only by Native Americans and the very few European settlers who had ventured into the edges of the swamp. In 1665, William Drummond, the first colonial governor of North Carolina, discovered the lake that now bears his name. Sixty years later, Colonel

William Byrd II led a surveying party into the swamp to draw a dividing line between Virginia and North Carolina and is sometimes credited with giving the swamp its forbidding name. George Washington visited the swamp in 1763.



USFWS

Historical Sign

With a group of share-holders, he organized the Dismal Swamp Company to drain, farm, and log portions of the swamp. A five-mile hand dug ditch leading from the western boundary of the refuge to Lake Drummond may be the first “monument” to bear Washington’s name.

In the period just before the Civil War, the swamp offered shelter and refuge for freedom-seekers traveling north to the port of Norfolk and beyond. Archeologists are just now uncovering the story of the maroons, those that choose to remain within the cover of the swamp. Their numbers remain unknown. Documented evidence led to the designation of the Great Dismal Swamp National Wildlife Refuge as an official site on the National Underground Railroad Network to Freedom.



NATIONAL
UNDERGROUND RAILROAD
NETWORK TO FREEDOM

The mystery, remoteness, cover, and solitude of the swamp have attracted and inspired people for many reasons. Robert Frost, Henry Wadsworth Longfellow, Harriet Beecher Stowe, and countless others have used the dismal swamp as a stage for their poetry and novels. Stowe’s *Dred: A Tale of the Great Dismal Swamp*, a sequel to her *Uncle Tom’s Cabin*, tells of the dangerous life of the runaways hiding in the swamp.



R. Winn/USFWS

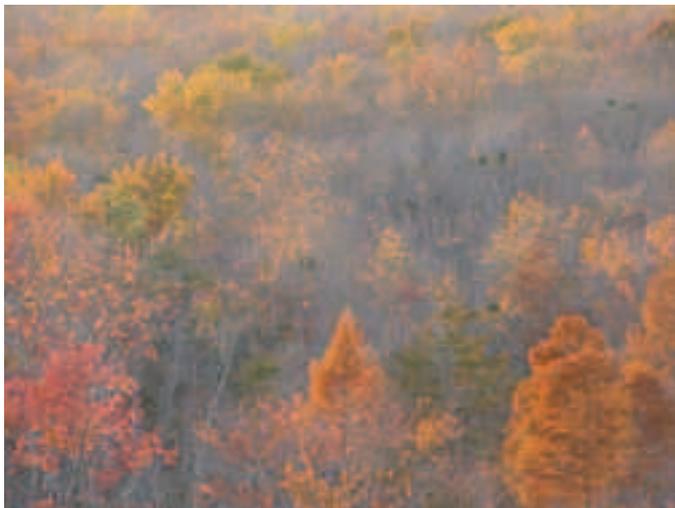
Atlantic white cedar

Resource Management—striving to preserve, protect and restore a unique ecosystem

As surrounding populations grew, people began to drastically alter the landscape of Great Dismal Swamp. Agricultural, commercial and residential development consumed more than half of the land within the historical boundaries of the swamp.

Logging proved to be a successful commercial activity, and the entire swamp has been logged at least once. Before the refuge was established, more than 150 miles of roads were constructed to provide access for timbering. Ditches were excavated to improve drainage; the ditch spoils were used to build the adjacent road

Fall trees



J. Ross/USFWS

beds. The roads severely disrupted the natural hydrology found in the swamp, blocking the flow of water across the surface of the land. The result is a swamp that is drier in some locations and is more prone to flooding in other areas. The effects of logging, a drier swamp, and the suppression of wildfires—fires that had cleared the land for new seed germination—created conditions less favorable to the survival of cypress and cedar trees. As a result, red maple and other forest types have become more predominant.

Protection with purpose

The primary purpose of the refuge resource management program is to restore and maintain the natural biological diversity that existed prior to the alterations caused by humans. Essential to the swamp ecosystem are its water, native vegetative communities, and varied wildlife. Water is being conserved and managed by manipulating water control structures in the lake and the ditches. Plant diversity is restored and maintained through forest management activities, such as selective cutting and prescribed burns that simulate the ecological effects of wildfire. Wildlife is managed by ensuring the presence of required habitats, with hunting as a tool to balance specific wildlife populations with available food sources.

Prescribed fire



USFWS

Wildlife and Plant Diversity

Plant Communities

Five major forest communities and three non-forest communities comprise the vegetation types found within the swamp. The forests include pine, Atlantic white cedar, maple-blackgum, tupelo-baldcypress and sweetgum-oak popular. The others are a remnant marsh, a sphagnum bog and an evergreen shrub community, also known as pocosin. Red maple is currently the most abundant and widely distributed tree species; it has expanded throughout the swamp due to the lingering effects of past logging, extensive draining and wild fire suppression. Tupelo-baldcypress and Atlantic white cedar, formerly dominant forest communities, currently account for less than 20 percent of the total cover.



*Virginia least
trillium*

W. Traylor

There are three rare species of plants deserving special mention, the Virginia least trillium, silky camellia, and log fern. Beds of Virginia least trillium are found in the northwestern section of the refuge and bloom briefly for a two-week period in March. Nearby, although less abundant, silky camellia are found on hardwood ridges. The log fern, one of the rarest American ferns, is more common in the Great Dismal Swamp than anywhere else in the country.

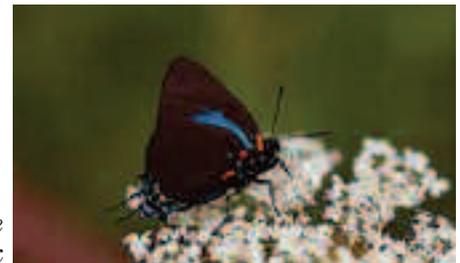


Pine warbler

© D. Schneider

Birds

More than 200 bird species have been identified since the refuge's establishment, ninety-six of which have been reported as nesting on or near the refuge. Birding opportunities are best during spring migration from April to June when the greatest diversity of species (particularly warblers) occurs. Two southern species, the Swainson's Warbler and Wayne's Warbler (a subspecies of the Black-throated Green Warbler), are more common in the Great Dismal Swamp than in other coastal locations. Winter brings massive movements of blackbirds and robins to the swamp and thousands of ducks, geese and swans can be seen on Lake Drummond. Other birds of interest are the Bald eagle, barred owl, pileated woodpecker, prothonotary warbler, wood duck, and woodcock.



*Great purple
hairstreak*

T. Kair/USFWS



D. Schwab/USFWS

Palemedes swallowtail on ironweed

Butterflies and Skippers

The butterflies and skippers of the Great Dismal Swamp have attracted butterfly enthusiasts from around the world. There are at least 57 species of butterflies and 49 species of skippers representing two-thirds of the known species inhabiting Virginia and North Carolina. A 4th of July Butterfly Count has been conducted in the Virginia portion of the swamp since 1993 with 42 butterfly species and 42 skipper species being recorded.

Mammals

The swamp supports a variety of mammals including otter, bat, raccoon, mink, gray and red fox, and gray squirrel. White-tailed deer are common, and although less often seen, American black bear and bobcat inhabit the area.

Reptiles and Amphibians

The Great Dismal Swamp provides habitat for a variety of reptiles and amphibians. Three species of venomous snakes—cottonmouth, timber “canebrake” rattlesnake, and the more common copperhead—occur here, along with 18 non-venomous species. Yellow-bellied and spotted turtle are commonly found in ditches. An additional 56 species of



D. Schwab/USFWS

*Timber
“canebrake”
Rattlesnake*

turtles, lizards, salamanders, frogs, and toads have been observed on the refuge.



W. Traylor

*Eastern box
turtle*

Nature’s Calendar

Winter

Bear cubs (usually two) are born to sows in late January through February. Great horned owls incubate eggs in late January and February. Red-tailed and red-shouldered hawks begin to court and lay eggs. Red maple trees flower in February. Waterfowl roost with several thousand arriving to rest on Lake Drummond. Wood ducks pair up and search for nest cavities. Winter is often when the swamp is at its wettest due to reduction of surface evaporation and plant evapotranspiration.

Spring

Virginia least trillium blooms in mid-March. Populations of migrating songbird peak early in May, with warblers the most abundant. White-tailed deer fawns (usually twins) are born. An occasional osprey visits the lake. Orchid, coral honeysuckle, yellow jessamine and yellow poplar are in flower. Cinnamon fern develops fiddleheads. Silky camellia begins flowering in late May. As “leaf-out” progresses, the water table drops below the ground’s surface and the swamp begins to dry out.



W. Traylor

Bobcat

Pileated woodpecker



©D. Schneider

D. Schwab/USFWS



White-tailed deer fawn

D. Freeman/USFWS



Zebra swallowtails puddling

Summer

American black bears are most active June through August and more likely to be seen as the breeding season peaks. White-tailed deer bucks are in velvet. Belted kingfishers and great blue herons are active along ditches. Swallowtails “puddle” on moisture found on ditch roads. Trumpet and passion vines bloom. The swamp is usually at its driest, with fire danger high from June to October.

M. Brown/USFWS



Biker

Fall

Autumn colors peak late October through November. Large flocks of robins and blackbirds gather to roost in the swamp. Wild fruits such as pawpaw, blackgum, devil’s walking stick and wild grapes are abundant. Re-charge of the swamp’s hydrological system begins and benefits from passing tropical storms.

Visitor Recreational Opportunities

D. Freeman/USFWS



Birding group

Visitors to the refuge may participate in a variety of activities including hiking, biking, nature photography, wildlife observation, hunting, fishing and boating. Most trails are open for hiking and biking only, from sunrise to sunset. The best times for observing wildlife are early morning and late afternoon. The refuge was established for the purpose of protecting and managing this unique ecosystem which includes wildlife and habitat. Therefore, portions of the refuge may be closed periodically to visitor activities in order to accomplish this objective.

Trails

The refuge offers three main entrances from which visitors will find miles of trails to explore. In the Jericho Lane, Washington Ditch (both located on White Marsh Road in Suffolk, Virginia) and Railroad Ditch (located on Desert Road in Suffolk, Virginia) entrances there are a variety of unpaved ditch roads to provide opportunities for hiking and biking.

Most popular are the Washington Ditch Trail, a four and one-half mile ditch road to Lake Drummond, and the elevated wooden Dismal Town Boardwalk Trail located adjacent to the Washington Ditch parking area. The boardwalk trail meanders for a mile through a representative portion of swamp habitats.

Couple on pier at Lake Drummond

D. Freeman/USFWS



In the Jericho Lane entrance there is a more primitive setting but with four trails to consider. Jericho Ditch and Lynn Ditch are favored by birding enthusiasts, or be challenged by the loop of north Jericho-Williamson-New-Hudnell Ditches (approximately six miles). Parking is available at the trail head two miles east of White Marsh Road.

The Railroad Ditch entrance offers the only auto access to Lake Drummond and is available by special pass from the refuge headquarters. It is recommended to contact the refuge office before a planned visit to inquire on availability of the pass as refuge management and road conditions occasionally restrict access. Within the Railroad Ditch entrance, on West Ditch Road, is found the West Ditch Boardwalk Trail. The 100 yard wooden trail offers wildlife viewing opportunities in a typically flooded wetland setting.

The Portsmouth Ditch entrance, off Martin Johnson Road in Chesapeake, Virginia, is a secondary entrance open for hiking and biking, but without benefit of a designated parking area. Other ditch roads are open for hunting, environmental education activities, research, and resource management activities by permit only.

Fishing/Boating

Fishing and boating are allowed year-round on Lake Drummond with access through the Feeder Ditch. The Feeder Ditch entrance is a water only access route connecting Lake Drummond with the Dismal Swamp Canal. Vessels must be small enough to portage around a spillway near the lake or to be lifted by electric tram to the higher level of the lake. Lift weight is restricted to a maximum of 1,000 lbs. Vessels are limited to 25 hp

on the Lake. If fishing, a Virginia fishing license is required. Boating access through the Railroad Ditch entrance to the Interior Ditch boat ramp is by permit only April 1 to June 15.

Educational Opportunities

A refuge orientation is available on-site and off-site for organized school, scout, civic, and professional groups by advance reservation. Outdoor classroom activities are to be lead by the teacher or group leader. Additional resources are available online and by contacting the Visitor Services staff.

Hunting

Big game hunting of white-tailed deer and American black bear is available by permit during designated periods in the fall and early winter, and in designated areas. Portions of the refuge are closed to other public use activities on hunt and hunter scouting days.

Camping/Picnicking

Overnight use is not permitted; there are no designated picnic areas or facilities on the refuge.

Railroad Ditch Trail



Safety Tips and Regulations

To protect refuge resources and to ensure a safe and enjoyable visit, please note the following information:

- mosquitoes, ticks, and biting flies may be numerous from May to September; insect repellent and protective clothing are suggested
- visitors must stay on designated trails
- pets must be kept on a hand-held leash at all times
- observe all signs while visiting the refuge; “Area Closed” signs are used to inform the public that the posted area is closed to all entry

West Ditch Marsh



D. Freeman/USFWS

The following activities or items are prohibited:

- collecting (includes catch and release) or harming any plant or wildlife
 - handling or feeding any wildlife
 - collecting artifacts or historical items
 - ditch fishing
 - swimming in the ditches or in Lake Drummond
 - consumption of alcohol
 - firearms and other weapons except as authorized during refuge hunts
 - playback recorders because they adversely affect wildlife behavior
- A complete listing of refuge regulations can be obtained from the refuge office.

Refuge Hours

Office Hours—located at 3100 Desert Road, Suffolk, Virginia—open Monday-Friday from 7:30 am-4:00 pm. Closed on federal holidays.
Refuge trails—Trails are open year round, Sunday through Saturday, sunrise to sunset unless otherwise posted.

General directions to the Refuge

From the north: South of downtown Suffolk, VA on Rt13 to Rt32, follow refuge signs.
From the south: Take Rt32 north towards Suffolk, follow refuge signs.
From eastern Virginia: Take I664 to Rt58 west, then Rt58 Business west, follow refuge signs.
From eastern North Carolina: Take Rt17 to Rt158 west, then Rt32 north, follow refuge signs.

The Great Dismal Swamp National Wildlife Refuge is one of nearly 550 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat representing the most comprehensive wildlife management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages national fish hatcheries, and provides federal leadership in habitat protection, fish and wildlife research, technical assistance and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

Cover photo of American black bear was taken by long-time refuge volunteer and advocate, Pat Cuffee, and is dedicated to her memory.

Current Research

Stories about escaped slaves in the swamp have been a part of local lore for centuries. Recent studies in the Great Dismal Swamp, however, have uncovered archaeological evidence to confirm the presence of maroon colonies. The Great Dismal Swamp Landscape Study is a partnership between American University and the U.S. Fish and Wildlife Service that aims to expand this knowledge. Every summer, professors and students conduct digs on sites deep within the swamp.

News of this research has found a wide audience. In 2004, the Refuge was designated as an important landmark on the National Underground Railroad Network to Freedom.

The study's findings were included in an award-winning documentary by WCTV of Chesapeake, VA. At the Great Dismal Swamp National Wildlife Refuge, visitors can visit the newly constructed Underground Railroad Education Pavilion, which was built to tell the story of maroons in the swamp. The story of maroon settlements will also be a featured exhibit in the new National Museum of African American History and Culture currently being built on the National Mall.



Dr. Dan Sayers of American University has conducted extensive archaeological research in the swamp. One of his findings is the outline of a maroon cabin, pictured above.

For more information about the Great Dismal Swamp and the Underground Railroad, you can visit the Underground Railroad Education Pavilion in the Great Dismal Swamp National Wildlife Refuge. Please check our web site or call the refuge headquarters for current information on auto access into the Railroad Ditch Trail. The refuge office is open Monday-Friday from 8:00 am to 4:00 pm. The pavilion is also accessible by a short hike or bike on Railroad Ditch Road.

A list of resources for further reading is available from the refuge headquarters.

Great Dismal Swamp National Wildlife Refuge
3100 Desert Road
Suffolk, VA 23434
(757) 986-3705
(757) 986-2353 fax
www.fws.gov/northeast/greatdismalswamp



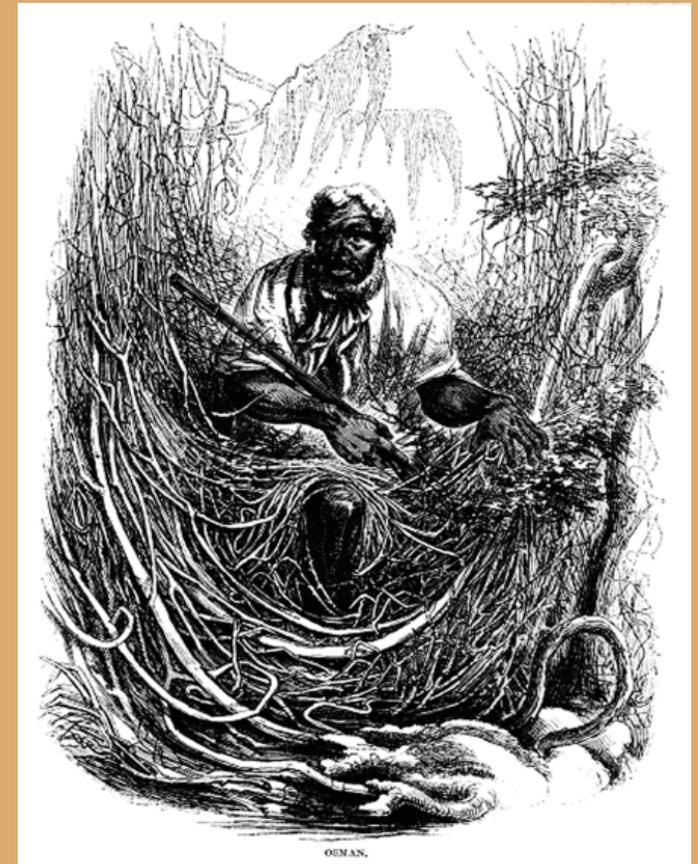
greatdismalswamp



@DismalSwampNWR



The Great Dismal Swamp and the Underground Railroad



Great Dismal Swamp
National Wildlife Refuge

The Great Dismal Swamp has long been known for its impenetrability, as a place where travelers could easily lose their way. Yet in the early centuries of American history, many of the people who vanished into the swamp were lost by their own choice. The swamp was a sanctuary for hundreds, maybe thousands of fugitive African-American slaves.

A Place Apart

From the early days of European exploration, the Great Dismal Swamp was considered a wild and inhospitable place. William Byrd II, who led a surveying party through the swamp in 1732 called it a “vast body of mire and nastiness... very unwholesome for inhabitants.” Nearby residents believed that the fog in the swamp carried diseases, and rumor held that lions lived in the swamp’s depths. As a result, the swamp was largely avoided by settlers.

The swamp’s isolation, however, made it an ideal place for those that didn’t want to be found. For centuries, slaves came to the Dismal Swamp seeking freedom. For many, the sprawl of densely forested wetlands on the Virginia-North Carolina border was a stopping point on their journey northward. For others, the swamp became a permanent home where they established hidden, largely self-sufficient settlements.

They were called maroons, a word that comes from the French word *marronage*, meaning “to flee.” Maroon communities developed throughout the American South, especially in inaccessible swampy areas. Because the maroons lived in secrecy, it is impossible to know exactly how many people called the Great Dismal Swamp home. Recent research suggests, however, that as many as 50,000 maroons may have lived in the swamp.

Life in the Swamp

Maroon colonies settled on areas known as “mesic islands,” areas of slightly higher elevation than the rest of the swamp. On these islands, escaped slaves established communities, built cabins, and may have even farmed small plots of land. They could have hunted deer, wild turkey and other game in the swamp, and foraged for a variety of edible plants.

Although preferable to slavery, life in the Dismal Swamp was very difficult. Dense undergrowth, including thorny greenbrier vines, made it difficult to move through the swamp. In the summer, mosquitoes, biting flies and snakes abounded. The maroons also lived in constant fear of discovery, for slave hunters with bloodhounds sometimes ventured into the swamp. The maroons went to great lengths to keep their communities hidden, even taking different routes back to their islands every day so that no one could trace their path.

As logging operations in the swamp expanded and trade along the Dismal Swamp Canal increased, maroon colonies began to trade with the outside world, especially with the hundreds of enslaved workers who

gathered shingles in the swamp. Maroons would help the shingle-gatherers meet their daily quotas in exchange for food, clothing and other necessities. Archaeologists have found pipes, glass bottles and even European pottery on the mesic islands- things the maroons would not have been able to obtain on their own.

After the Civil War, residents of the swamp no longer had to hide. Many settled in the surrounding area, and found work on the canal, as shingle gatherers, or as farmers.



The Great Dismal Swamp in Literature

Many authors and historians have written about the swamp’s role as a hiding place. Abolitionist Harriett Beecher Stowe’s 1856 novel *Dred: A Tale of the Great Dismal Swamp* captured the imagination of thousands of readers, as did Henry Wadsworth Longfellow’s poem “The Slave in the Dismal Swamp.” Still, the secretive nature of its inhabitants meant that little was truly known about life in the swamp.

More was known about the lives of the enslaved workers who worked in and around the swamp. The Dismal Swamp Canal, which borders the Swamp, was hand dug by slave labor. Moses Grandy, an enslaved waterman who worked in the swamp and on the canal, told of his experiences in *Narrative of the Life of Moses Grandy*. Grandy and others managed to earn enough money working on the canal to buy their freedom.

Mattamuskeet

National Wildlife Refuge



Mixed flock at Mattamuskeet NWR, Allie Stewart, USFWS

Mattamuskeet National Wildlife Refuge is located on the Albemarle-Pamlico Peninsula in Hyde County, North Carolina. Established in 1934, the 50,180-acre Refuge consists of open water, marsh, forest and croplands. The centerpiece of the Refuge is the shallow Lake Mattamuskeet. At 40,100 acres, it is North Carolina's largest natural lake.

The Refuge's strategic location along the Atlantic Flyway makes it a vitally important site for migrating and wintering waterfowl. Over the past 35 years, up to 80 percent of the Northern Pintail and up to 30 percent of Green-wing Teal that annually migrate along the Flyway utilize Mattamuskeet. In total, the Refuge attracts more than 200,000 ducks, geese and swans from November through February.

About 58,000 visitors use the Refuge annually to hunt, fish, and observe and photograph wildlife.

Refuge History

In the early 20th century, farmers and developers attempted to drain Lake Mattamuskeet, building the world's largest pumping plant at the time. The lake was drained for certain periods to convert the lake bottom to farmland. Eventually, the effort was abandoned as impractical and too expensive.

After the U.S. Government acquired the land in 1934 to establish the Refuge, the Civilian Conservation Corps converted the former pumping plant into a hunting lodge that was operated until 1974. The Mattamuskeet Lodge was placed on the National Register of Historic Places in 1980, and it was transferred to the North Carolina Wildlife Resources Commission in 2007.

Habitat and Wildlife

A system of 14 manmade wetland impoundments totaling nearly 2,500 acres surround the south, east and west sides of the lake, providing feeding and resting areas for wintering waterfowl and many other species of migratory birds as well as resident wildlife. The impoundments are managed by pumps and water control structures. Bald cypress trees, mixed hardwood forest, grassland, cropland and scrub-shrub habitat contribute to the diversity of habitat on the Refuge.

In addition to waterfowl, the Refuge is home to a diverse population of wildlife, including deer, bobcat, gray fox, black bear, the endangered red wolf, largemouth bass, crappie, blue crab, blueback herring and American eel. The rich diversity of habitats provides a haven for amphibians and reptiles such as bullfrogs, southern

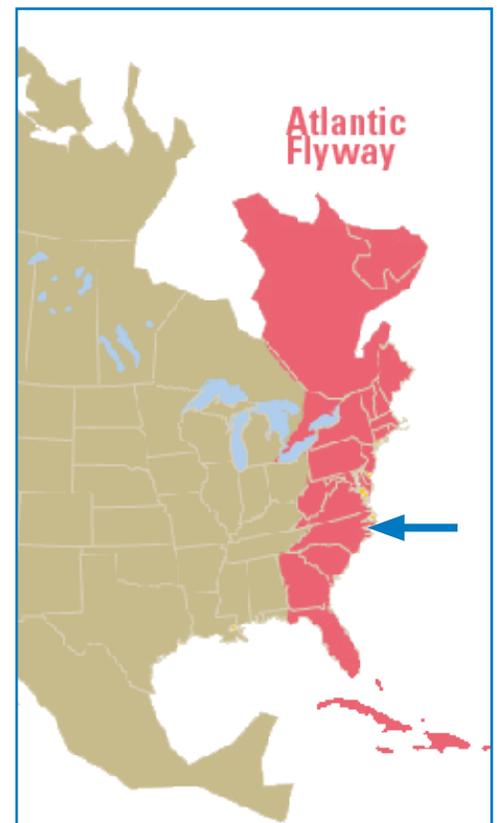
leopard frogs, spring peepers, snapping turtles, yellow-bellied sliders, eastern fence lizards and 31 species of snakes. There are also more than 240 resident and migratory bird species including the Osprey and Bald Eagle.

Lake Mattamuskeet is 18 miles long and 5 to 6 miles wide, with an average depth of 2 feet. Swans, diving ducks and some puddle ducks eat the abundant beds of submerged aquatic vegetation that grows in the lake. Lake levels fluctuate by rainfall, wind tides, and evaporation during summer months.

Frequently Asked Questions

Does the Refuge manage lake levels?

The Refuge does not actively manage water levels in the lake. The primary purpose of the Refuge is to protect and conserve migratory birds and other wildlife through the protection of wetlands. The best way to achieve that end is to allow the lake level to rise and lower naturally. Specifically, flapgates facilitate the flow of water from the lake



Mattamuskeet NWR is in a strategic location along the Atlantic Flyway, a bird migration route.



Great Blue Heron, USFWS

to Pamlico Sound when lake levels are higher than sound levels. When the lake falls below the levels of the sound, the gates close to prevent saltwater from entering the lake. Lake levels tend to be higher during the rainy season (winter) and lower during the dry season (summer). The lower lake levels in the summer spur the growth of emergent and submergent wetland plants that are used by migrating and wintering waterfowl.

The Refuge also periodically dredges portions of the four canals connecting the lake to the sound. Maintaining the original depth of the canals improves their flushing capacity, which keeps the lake healthy by removing excess nutrients and sediments and allows the canals to move more water during storm events to prevent flooding. In addition, fish utilize the deeper water in the canals when the lake temperature rises.



A Green-winged Teal with four American Coots, Jeff Lewis.

Is the salinity in the lake increasing?

No, not year to year. However, due to evaporation, salinity increases slightly during the summer months mainly around the mouths of the major outlet canals.

Are there fewer largemouth bass in the lake today than previous years?

Most likely. Based on survey results, it appears there has been a gradual decline in largemouth bass populations in recent years. Possible causes include a lack of fish stocking, degraded water quality, decreased spawning success and high predation rates. No fish have been stocked in the lake since 2007. The Service is working with the North Carolina Wildlife Resources Commission's fisheries staff to study the health and well-being of the largemouth bass population and other popular game species.

Why can anglers catch both freshwater and saltwater species in the lake?

A series of manmade canals connect the lake to the sound. Species such as white perch, flounder, spot, croaker and blue crab have a wide salinity tolerance and can live in the fresh to low salinity waters of the lake. Anglers have been catching both freshwater and saltwater species dating back to at least the 1940s.

Why is Phragmites growing in the lake?

Phragmites (*Phragmites australis*), is a non-native, invasive plant that is found in coastal areas throughout the eastern U.S. A common reed, it has been found on the Refuge since the 1960s. The Refuge actively controls the reed to promote native wetland plants in the wetland impoundments using chemical and mechanical methods. Plans to expand management efforts to include the lakeshore will proceed when more funding becomes available.

Is the lake's aquatic community healthy?

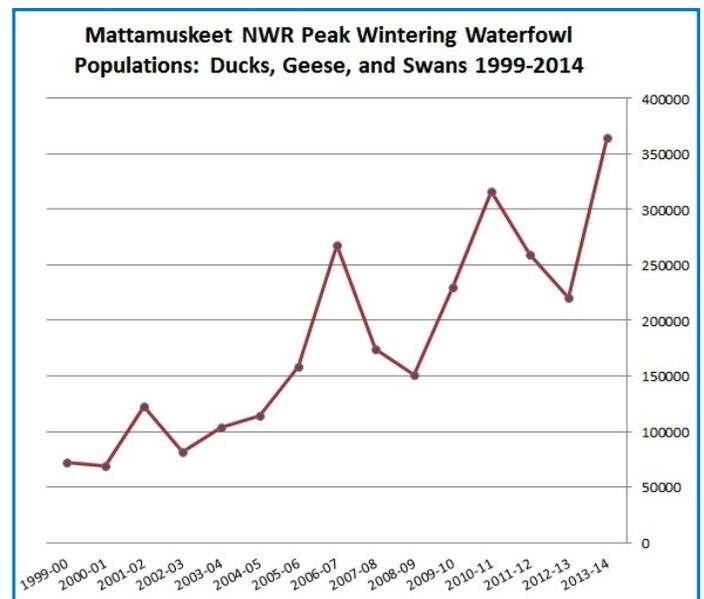
Our research and monitoring results have found the aquatic vegetation on the east side of Highway 94 to be healthy and vibrant, able to support large concentrations of waterfowl, other birds, fish and blue crab. The water on the west side of Highway 94 has



Bobcat kitten, Allie Stewart, USFWS

much less submerged aquatic vegetation and has experienced algal blooms. The Refuge is investigating the cause of the diminished water quality.

For more information, please go to www.fws.gov/mattamuskeet or contact Pete Campbell, Refuge Manager, at pete_campbell@fws.gov or 252/926 4021.



Since the winter of 1999-2000, the number of wintering waterfowl at Mattamuskeet NWR has more than tripled.

Patuxent Research Refuge
10901 Scarlet Tanager Loop
Laurel, MD 20708-4027
301/497 5580
301/497 5763
<http://patuxent.fws.gov>

Federal Relay Service
for the deaf and hard-of-hearing
800/877 8339
301/497 5763 through Relay Service

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June 2010



U.S. Fish & Wildlife Service

Patuxent

Research Refuge



Established in 1936 by executive order of President Franklin D. Roosevelt, the Patuxent Research Refuge is the nation's only national wildlife refuge established to support wildlife research. With land surrounding the Patuxent and Little Patuxent Rivers between Washington, D.C. and Baltimore, MD, the refuge has grown from the original 2,670 acres to its present size of more than 12,800 acres and encompasses land formerly managed by the Departments

of Agriculture and Defense. Throughout decades of change, Patuxent's mission of conserving and protecting the nation's wildlife and habitat through research and wildlife management techniques has remained virtually unchanged.

Introduction



This blue goose, designed by J.N. "Ding" Darling, has become the symbol of the National Wildlife Refuge System.

Patuxent Research Refuge supports a wide diversity of wildlife in forest, meadow and wetland habitats. The land is managed to maintain biological diversity for the protection and benefit of native and migratory species. During the fall and spring migrations, many waterfowl species stop to rest and feed. Approximately 270 species of birds have been documented on the refuge.

Increasing forest fragmentation in the area due to urban development has damaged many populations of neotropical migratory birds. The refuge is one of the largest forested areas in the mid-Atlantic region and provides critical breeding habitat and an important nesting area for these species.

Patuxent Research Refuge consists of three areas: 1) North Tract, formerly a military training area; 2) Central Tract, where administrative offices and the study sites of many research biologists are located; and 3) South Tract, where the National Wildlife Visitor Center is located. The National Wildlife Visitor Center and North Tract are the only areas open for visitor activities such as hunting, fishing, wildlife observation, wildlife photography and educational programs.

Hooded Merganser Drake



Tim McCabe



N. Baldaachino/USFWS

Researchers

North Tract

The North Tract of Patuxent Research Refuge (east of Laurel) includes 8,100 acres that were formerly a military training area. The North Tract entrance is located off MD Route 198, just 1.4 miles east of the Baltimore/Washington Parkway (Route 295). The land was transferred from the Department of Defense to the refuge in 1991, and it is open for visitor activities that are compatible with research and wildlife management objectives.

The Visitor Contact Station is located on Bald Eagle Drive, one mile south of its intersection with MD Route 198. All visitors must check in and receive an access pass. The North Tract is open daily (except federal holidays) from 8:00 am until 4:00 pm. Call 301/776 3090 to confirm operating hours and for more information.

Central Tract

The Central Tract of Patuxent Research Refuge is the location of the headquarters offices of both the Patuxent Research Refuge and its

research partner, the U.S. Geological Survey's Patuxent Wildlife Research Center. It is also home to offices of the Fish and Wildlife Service's Division of Migratory Bird Management. The Central Tract of the refuge is closed to public visitation due to the sensitive nature of much of the scientific work.

South Tract National Wildlife Visitor Center

The National Wildlife Visitor Center (Visitor Center) is located on the South Tract of the refuge off of Powder Mill Road between MD Route 197 and the Baltimore/Washington Parkway (Route 295), south of Laurel. It is one of the largest science and environmental education centers operated by the Department of the Interior. This unique facility seeks to impart to young and old alike an increased knowledge of and appreciation for the earth's vital resources. It highlights the work of those who strive to improve the condition of wildlife and their habitats.

The visitor center features interactive exhibits which focus on global environmental issues, migratory bird studies, habitats, endangered species, the tools and techniques used by scientists and the role of the National Wildlife Refuge System

Environmental Education



USFWS



N. Baldachino/USFWS

Hunting

in wildlife conservation. The visitor center also offers wildlife observation trails, seasonal tram tours, a seasonal fishing program, wildlife management demonstration areas and outdoor education sites for school classes. A large auditorium and meeting rooms can accommodate scientific conferences and meetings, teacher workshops, lectures and traveling displays. A bookstore, *Wildlife Images*, operated by the Friends of Patuxent (a non-profit cooperating association) offers a variety of conservation books and other educational materials. The visitor center is open daily from 9:00 am until 4:30 pm. Wildlife observation trails are open daily from sunrise to 4:30 pm. Both visitor center and grounds are closed on federal holidays. You may call 301/497 5763 or visit the refuge web site to confirm operating hours and for more information.

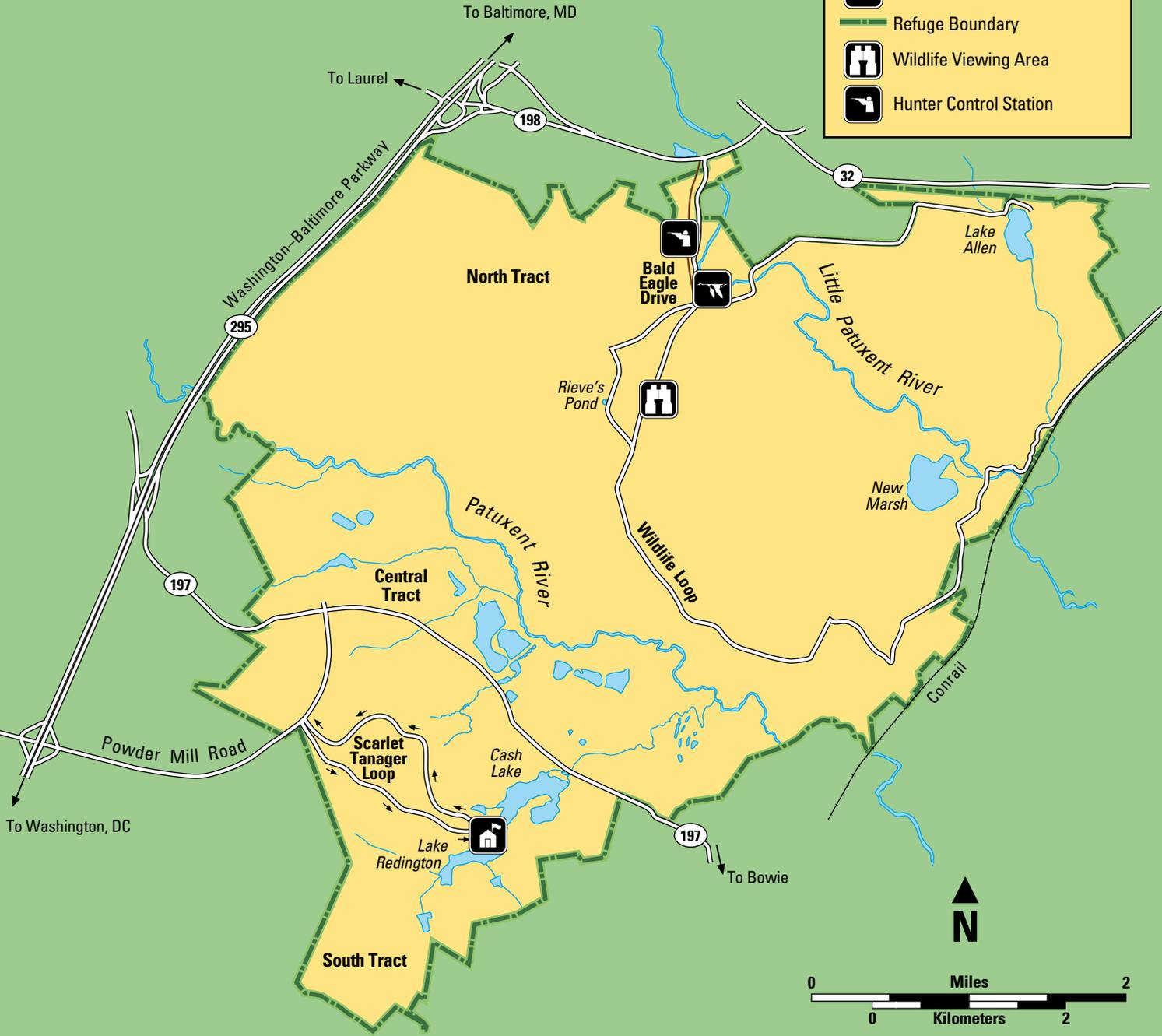
Hunting

The refuge hunting program is administered by the refuge in conjunction with Meade Natural

Patuxent Research Refuge

LEGEND

-  National Wildlife Visitor Center
-  Visitor Contact Station
-  Refuge Boundary
-  Wildlife Viewing Area
-  Hunter Control Station





N. Baldacchino/USFWS

Fishing

Heritage Association (a cooperating association). Hunting is typically permitted only during established Maryland hunting seasons (usually September–January). A valid Maryland hunting license, verification of completion of a hunter safety course and other applicable documents are required. You may listen to a hunting information announcement by calling 301/317 3825. More information is available by calling 301/317 3819 during the hunting season. You may also visit the refuge Website (<http://patuxent.fws.gov>) or www.mnha.net.

Fishing

Anglers may fish seasonally mid-June to mid-October (hours are posted on the required refuge fishing permit) at Cash Lake located off of MD Route

197 on the South Tract of the refuge. Anglers may fish year-round (with some exceptions) during operating hours at the Refuge North Tract. A Maryland state fishing license and refuge fishing permit are required. Fishing regulations, permits and maps are available at both the North Tract Visitor Contact Station and at the National Wildlife Visitor Center. Common species include bluegill, largemouth bass, catfish, black crappie, pickerel, eel, suckers, warmouth and pumpkinseed.

Wildlife Observation and Photography

The refuge offers many opportunities to observe and photograph wildlife. At the North Tract, approximately 20 miles of roads and trails exist for hiking, bicycling, and horseback riding. The Baltimore Gas and Electric Company has contributed to the creation of a wetland and wildlife viewing area where visitors may see waterfowl, shorebirds, raptors and songbirds in an area that was formerly an artillery firing range. At the South Tract, approximately

Birding



N. Baldacchino/USFWS



*The National Wildlife
Visitor Center*
N. Baldacchino/USFWS

5 miles of trails exist for hiking only (no bicycles are allowed). Trails and the seasonal tram tours highlight wildlife habitat and management practices.

Educational Programs and Special Events

Staff and volunteers offer guided bird and nature walks as well as environmental education programs throughout the year at both the North and South Tracts. Announcements of upcoming programs and special events are posted at refuge contact facilities, in local newspapers and on the refuge Website. The Website also features special information for teachers, scout leaders and other group leaders interested in visiting the refuge.

Volunteers

Volunteers are an important part of the refuge. They assist with public use programs, wildlife management activities, environmental education programs, trails maintenance and clerical assistance. See the refuge

Visitor Regulations

Website or visit the refuge for more information.

The staff at Patuxent Research Refuge strive to maintain the U.S. Fish and Wildlife Service's mission to conserve, protect and enhance wildlife and their habitats. It is the visitor's responsibility to ensure that wildlife has a place to grow and survive for future generations by respecting and obeying refuge regulations. In all cases, public access, use, or recreational activities not specifically permitted are prohibited. Please inquire at the North Tract Visitor Contact Station or National Wildlife Visitor Center to ensure your activity is permitted. All visitors to Patuxent Research Refuge are expected to comply with local, state and federal laws and regulations, as well as with the following conditions:

Traveling off roads, off trails and in closed areas is prohibited. The refuge speed limit is 25 mph unless posted otherwise.

Pets must be kept on a leash (no longer than 10 feet) and under control

Volunteer
L. Garrett



at all times. Pets are not allowed in refuge ponds or waterways.

Please do not litter. Take trash (including pet waste) with you and dispose of it properly.

Plants and animals (living or dead) may not be disturbed, introduced or removed — with the exception of legally harvested game and fish.

Activities such as swimming, tubing, rafting, picnicking and sunbathing are not allowed on the refuge. The use of boats for fishing is permitted only at Cash Lake with a valid refuge fishing permit.

Persons possessing, transporting, or carrying firearms on national wildlife refuges must comply with all provisions of state and local law. Persons may only use (discharge) firearms in accordance with refuge regulations (50 CFR 27.42 and specific refuge regulations in 50 CFR Part 32).

Alcoholic beverages are prohibited.



Great blue heron
H. Stein

Eastern Virginia Rivers National
Wildlife Refuge Complex
Rappahannock River Valley National
Wildlife Refuge
336 Wilna Road
PO Box 1030
Warsaw, VA 22572
804/333 1470
804/333 3396 Fax
E-mail: fw5rw_evrnwr@fws.gov
www.fws.gov/northeast/rappahannock

Federal Relay Service
for the deaf and hard-of-hearing
1 800/877 8339

U.S. Fish and Wildlife Service
1 800/344 WILD
<http://www.fws.gov>

August 2008



U.S. Fish & Wildlife Service

Rappahannock River Valley

*National Wildlife
Refuge*



Magnolia Warbler
Clifford Otto

*Rappahannock
River Valley
National Wildlife
Refuge is the newest
of four refuges that
compose the Eastern
Virginia Rivers
National Wildlife
Refuge Complex.*



*This goose,
designed by J.N.
“Ding” Darling,
has become the
symbol of the
National Wildlife
Refuge System.*

Established in 1996, our goal is to protect 20,000 acres of important wetland and upland habitat along the river and its major tributaries. With help from our conservation partners, including Chesapeake Bay Foundation, The Conservation Fund, The Nature Conservancy, The Trust for Public Land, and Fort A.P. Hill, we are well on our way toward achieving our land protection goal, which includes the purchase of conservation easements.



Catherine Markham

*Young bald eagle
in nest*

Wildlife and Habitat Management

Bald eagles nest and roost in significant numbers throughout the refuge boundary area. In fact, the state's largest wintering roost for bald eagles is located within the refuge boundary. The bald eagle was removed from the list of federally threatened species in August 2007, but remains a high priority for refuge management. The sensitive joint-vetch, a rare plant found only in freshwater tidal marshes, is the only confirmed federally listed species on the refuge.

Wilna pond



USFWS

*Right:
Le Conte's
sparrow
Far right:
Viceroy*



John Fox



John Fox

Shorebirds, neotropical migrant songbirds, raptors, and marsh birds rely on the Rappahannock River's corridors during the spring and fall migration periods. With help from partners and volunteers, refuge staff are restoring native grasslands and riparian forests along the river and tributary streams to provide additional habitat for these species. Focus species and species groups for management include bald eagles, forest-interior dwelling species such as wood thrush and scarlet tanager, and grassland nesting birds such as grasshopper sparrow and northern bobwhite.

*Wilna grassland
with flowers*

Being a relatively new refuge, we are still in the process of establishing the full compliment of baseline biological surveys. We have conducted habitat mapping using geographic information systems, breeding bird surveys, marsh bird surveys, aerial waterfowl surveys during migration and winter, small mammal surveys, insect trapping, anuran (frogs) call counts, and vernal pool investigations. The refuge enrolled seven fields totaling 230 acres in a regional research study looking at



USFWS

Green tree frog

different management techniques to benefit grassland-nesting birds. We have studied three different techniques for taking a census of wintering grassland songbirds. We are now refining our inventories to also assess the effectiveness of habitat management activities and to determine the relative value of the refuge during fall migration and for pollinators.

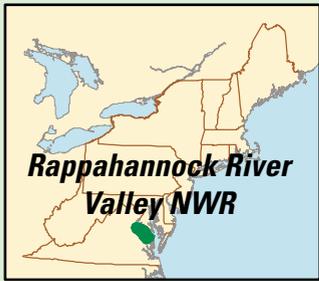
Beginning in 2001, the refuge has taken a leadership role in controlling invasive stands of *Phragmites australis* (common reed) on both public and private lands along the entire tidal portion of the Rappahannock River. Using grants and matching private funds, we have been able to treat 120 different stands of *Phragmites* totaling over 250 acres. More than 200 private landowners have enrolled in the control program. In 2007, we began offering workshops to assist landowners in controlling other invasive species on their lands.

History

The Atlantic Flyway Council first proposed establishing a national wildlife refuge on the Rappahannock River in the early 1960s. However, it wasn't until the early 1990s that individuals, conservation organizations, and government agencies united to develop a plan for conserving the natural resources of the river for future generations. Rappahannock River Valley National Wildlife Refuge was formally proposed in 1994, and the first tract was acquired in 1996.

Throughout its history, the Rappahannock River has nurtured native Americans, the earliest colonists, and Revolutionary War heroes. Today the river continues to sustain many of their direct descendants. Archeological and historic sites are abundant on both sides of the river. The 18th century





Rappahannock River Valley

National Wildlife Refuge

- Refuge Property
- Easement
- Highway
- Road

Miles
0 0.45 0.9 1.8 2.7 3.6 4.5

Kilometers
0 1 2 4 6 8 10

N



USFWS

Wilna pond levee

Bristol Iron Works was located adjacent to the refuge's Toby's Point Unit, while the Leedstown Resolves, a 1766 protest against the Stamp Act, was signed near the refuge's Mothershead Unit. Old pilings can still be seen from the days when steamboats made regular stops to pick up produce and passengers for transport to the Port of Baltimore.

Agriculture and forestry remain the predominant land uses and sources for the area's economy, as they have for centuries. Some still make their living on the river, crabbing and fishing, while wildlife recreation and tourism are becoming increasingly important economic engines for the region. As the refuge grows, it will make increasing contributions to the local culture and economy as we work with partners to conserve natural resources, improve water quality, and provide compatible, wildlife-dependent recreational opportunities for residents and visitors.

Gray fox



John Fox

*Headquarters
Wilna House*



USFWS

Visitor Services

While wildlife and habitat conservation come first on refuges, excellent wildlife observation, photography, fishing, environmental education, interpretation, and hunting opportunities can be enjoyed on several units of the refuge.

New visitor facilities were constructed on the Hutchinson Tract in Essex County in 2008. They include 2 miles of accessible wildlife viewing trails, fishing pier, and canoe launch. The Wilna Unit, located in Richmond County, is open to the public for visitation, seven days a week, sunrise to sunset. Also the location of the refuge headquarters, this site offers accessible fishing, excellent wildlife observation opportunities, and accessible nature trails.

Other refuge units are open for visitation on a reservation basis. Visit or contact the refuge headquarters for more information.

Volunteering

Volunteers and refuge friends play a critical role on national wildlife refuges and this refuge is no exception. Opportunities exist year-round for people to lend a helping hand in numerous areas of refuge management.

For more information on volunteering or the friends group, contact the refuge headquarters.

Guidelines

Help preserve the Rappahannock River and make your visit safe and enjoyable by following these guidelines.

Enjoy wildlife observation and photography throughout the year on marked trails at the Hutchinson Tract and Wilna Unit, and by reservation at other tracts.

Fishing

Permitted year-round on Wilna Pond and at Mt. Landing Creek (Hutchinson Tract). All Virginia boating laws and fishing regulations apply. At Wilna Pond, largemouth bass are catch and release only, and live minnows are prohibited as bait. Use of lead sinkers is prohibited at all fishing areas. Check with the refuge office about other fishing opportunities.

Environmental Education

Encouraged year-round at the Wilna Unit by reservation. Contact the refuge headquarters for details about educator-led activities, available supplies, and scheduling visits.

Hunting

Free roam/still hunting is available for archery and firearm hunters on designated refuge units. Contact the refuge headquarters for more information and to apply for a permit.

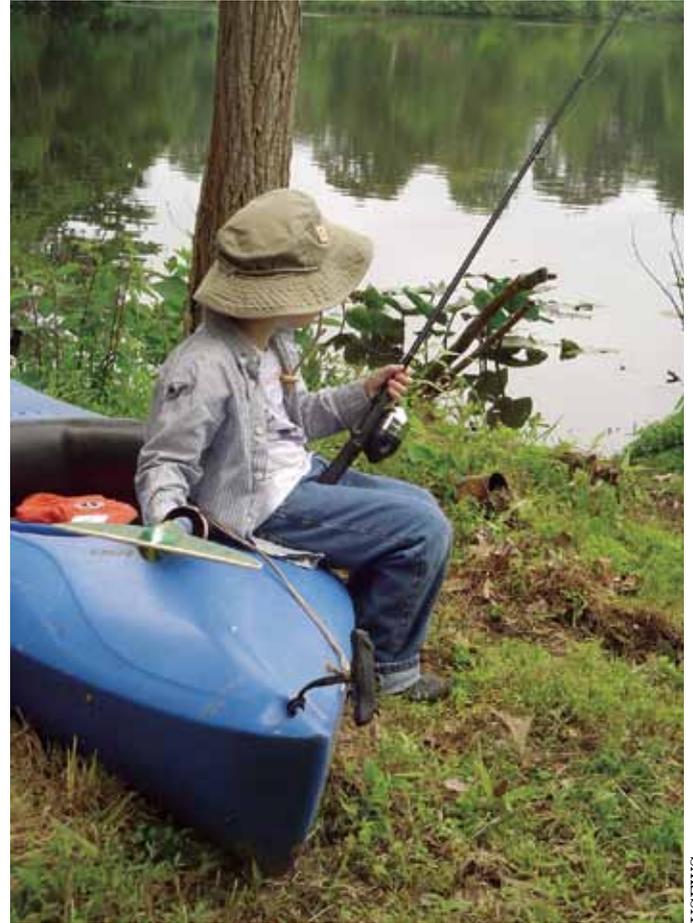
Firearms and other weapons

Prohibited on the refuge except during designated hunts.

Environmental Education Program



Diane Wheeler



USFWS



USFWS

Newly hatched wood ducks

Pets

Must be kept on a leash.

*Plants,
Animals, and
Artifacts*

Disturbing or collecting is prohibited.

**Prohibited on
the refuge**

Swimming, camping, fires, horseback riding, and jogging or bicycling on trails designated for wildlife observation.



USFWS

*Below:
White-spotted
Slimy salamander*

*Northern
watersnake*



Stephanie Day

Getting There

From Tappahannock, Virginia, take US-360 E (across the Rappahannock River, toward Warsaw). Follow US-360 E for 4.1 miles, then turn LEFT onto Route 624/Newland Rd. Follow Newland Rd. for 4.2 miles, then turn LEFT onto Strangeway/Route 636. Follow Strangeway for 1/4 mile, and then turn RIGHT onto Sandy Lane/Route 640. Follow Sandy Lane for 1.1 miles, and then turn LEFT into Rappahannock River Valley National Wildlife Refuge.



David Vangelder

Elizabeth River Project

Making restoration a reality



<https://elizabethriver.org/>

Join the revolution to restore the Elizabeth River.
YOU make all the difference.



Find YOUR role as a River Star



How are we making a difference?



Donate/Become a Member



Come have FUN at Paradise Creek Nature Park



All aboard the Learning Barge!

We are cleaning up the Elizabeth River through education and restoration projects.

The Elizabeth was once presumed dead as one of the most polluted rivers on the Chesapeake Bay, but recently we've celebrated the return of sea horses and river otters.

We're one of the first environmental groups to use a collaboration model. We don't point fingers but work positively to help businesses, schools and homes make progress. We recognize them as River Stars when they do.



[HOME](#) [ABOUT](#) [ACTIVITIES](#) [DONORS](#) [EDUCATION](#) [VOLUNTEERS](#) [RIVER STARS](#) [CONTACT](#)



About the Park

Saluting the Park Partners

[Park Map](#)

[Directions](#)


[Funding](#)
[About Elizabeth River Project](#)

Downloadable Field Guides

[Spring Field Guide](#)
[Summer Field Guide](#)
[Fall Field Guide](#)

Enjoy Your Visit!

Open Mar-Oct, 6:30am -7:30pm; Nov-Feb, 7am - 5:30pm

Fred. W. Beazley River Academy (hours vary) - Opens April 3, 2018

Free kayak launch with short tote from parking

Two miles of handicap accessible trails

Dominion Wetlands Learning Lab for student field trips

No smoking permitted on the premises

Dogs welcome on leash of up to seven feet

Please conserve wildlife: no fishing, crabbing, or littering (section 18.2-134)

No motorized vehicles on trails

Thank you!

The **City of Portsmouth** maintains Paradise Creek Nature Park as its third largest public park.

The non-profit **Elizabeth River Project** raised the funds to buy and improve the site and now operates the park's environmental education, restoration, and volunteer programs.

The **Port of Virginia**, in 2012, restored the park's 11 acres of wetlands, bringing back part of the Elizabeth River that was filled in the 1950s.

An Oasis for Recreation and Education

Paradise Creek Nature Park provides the rare opportunity to enjoy a restored Elizabeth River - first-hand. This 40-acre, waterfront park will teach generations what it takes to bring back the health of an urban river, once presumed dead. Two miles of trails lead the visitor through an urban forest under revitalization, 11 acres of new tidal wetlands, and past industrial partners all doing their part to bring back your home river. Visit to enjoy the songbirds and waterfowl returning to this oasis of peace in an urban setting. Come for education programming, special events and volunteer opportunities.

A Park for Posterity — and Prosperity

Urban parks are in renaissance world-wide. That's because green spaces don't just filter pollution. More than 30 studies have shown that parks have a positive impact on nearby property values. Parks calm crime. Access to nature increases children's ability to concentrate. In fact, parks are "essential to human well-being" (National Geographic, 2006). Be part of this magic at Paradise Creek Nature Park.