

Wetlands in the National Parks

U.S. Department of the Interior
National Park Service



Big Meadows, Rocky Mountain National Park, CO David Cooper



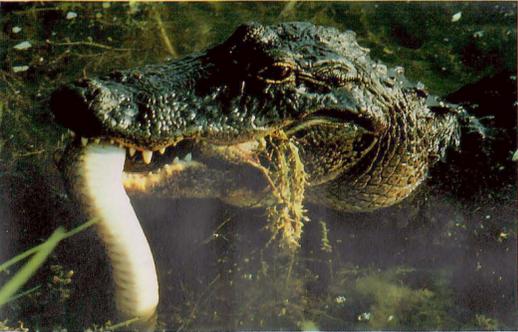
Roseate spoonbill, Everglades National Park, FL Joel Wagner



"Muhly grass" bloom in a seasonally flooded pineland, Everglades National Park, FL Joel Wagner



Dragonfly in Shark River Slough, Everglades National Park, FL Joel Wagner



Alligator with green watersnake, Everglades National Park, FL Joel Wagner

Wetlands are transitional areas between land and water bodies, where water periodically floods the land or saturates the soil.

The term *wetlands* includes wet environments such as marshes, swamps, and bogs. They may be covered in shallow water most of the year, or be wet only seasonally. Plants and animals found in wetlands are uniquely adapted to these wet conditions. Wetlands can be found in virtually every county of every state in the nation, from arctic tundra wetlands in Alaska, to peat bogs in the Appalachians, to riparian wetlands in the arid West.

In the past, wetlands were often regarded as wastelands -- sources of mosquitos, flies, and unpleasant odors. Most people felt that wetlands were places to be avoided, or better

yet, eliminated. It was accepted practice to drain or fill wetlands for other uses, or to use them as dumping grounds. As a result, more than half of America's original wetlands have vanished.

Today, wetlands are known to serve a variety of important functions. They provide critical habitats for fish and wildlife, purify polluted waters, and check the destructive power of floods and storms. Wetlands also provide recreational opportunities such as fishing, hunting, photography, and wildlife observation. They are fast becoming recognized as productive and valuable resources.



Firehole River, Yellowstone National Park, WY Joel Wagner

DEFINITIONS

- aquatic:** Living or growing in water
- estuary:** An area where sea water mixes with fresh water
- riparian:** Lands, including wetlands, adjacent to creeks, streams, or rivers where the vegetation is strongly influenced by the presence of water
- emergent plant:** A rooted aquatic plant that normally extends above the surface of the water (for example: cattail, bulrush)
- floodplain:** A nearly flat plain along a river or stream that is subject to flooding
- tidal wetlands:** Wetlands in which the water level fluctuates with the tide

Types of Wetlands

A wide variety of wetlands have formed across the country due to regional and local differences in climate, geology, topography, hydrology, soils, vegetation, water chemistry, and other factors. Although there are many different wetland types, they can be divided into two broad categories: **NON-TIDAL WETLANDS** and **TIDAL WETLANDS**.

NON-TIDAL WETLANDS account for most of the wetlands of the United States and are found throughout the nation's interior beyond tidal effects:



Bog in interior Alaska, Yukon-Charley Rivers National Preserve Joel Wagner



Cypress swamp, Everglades National Park, FL Joel Wagner



Inland freshwater marsh, Denali National Park and Preserve, AK Joel Wagner



North Dakota prairie potholes US Fish and Wildlife Service



Riparian wetlands in the arid Southwest Kelly Close

Peatlands are inland wetlands containing thick deposits of slowly decaying plant material called peat. "Bogs" and "fens," the major types of peatlands, occur in old lake basins or other topographic depressions in the Great Lakes states, portions of the Northeast, the Appalachian Mountains, much of Alaska, and along the Southeastern Coastal Plain. Unusual plants such as sphagnum moss, pitcher plants, sundews, Venus-flytraps, and a number of orchid species are uniquely adapted to the nutrient-poor, acidic conditions found in bogs. Fens are richer in nutrients and less acidic than bogs, and are more typically covered by sedges, willows, grasses, and reeds.

Southern Deepwater Swamps are wooded wetlands of the southeastern U.S. that have standing water for most, if not all, of the growing season. Characteristic trees of these swamps are bald cypress, tupelo gum, and water oak.

Inland Freshwater Marshes include a variety of wetlands that are full of soft-stemmed plants like grasses, rushes, cattails, and water lilies. They can form in isolated depressions such as the "prairie potholes" of the upper Midwest, as fringes around lakes and ponds, or as nearly flat expanses of emergent wetlands such as those found in Everglades National Park. Wet "mountain meadows" are high elevation freshwater wetlands found in forested and non-forested mountain regions.

Riparian Wetlands form on the floodplains of rivers and streams, and are often dry for portions of the growing season. In the southeastern U.S., "bottomland hardwood forests" are the most common type of riparian wetland. In the arid regions of the West, they are common along rivers and springs and often contrast noticeably with the surrounding upland vegetation.

TIDAL WETLANDS are found along our nation's coasts within reach of the oceans' tides:



Tidal salt marsh, St. Marks National Wildlife Refuge, FL Joel Wagner



Red mangroves, Everglades National Park, FL NPS Photo



Tidal freshwater marsh, Everglades National Park, FL Joel Wagner

Tidal Salt Marshes develop near river mouths, behind barrier islands, in bays, on coastal plains, or in other areas affected by tides and protected from the full force of the surf. Typically vegetated by grasses and other emergent plants adapted to salt water, they can range from narrow fringes on steep shorelines to nearly flat expanses several miles wide.

Mangrove Swamps replace tidal salt marshes in subtropical and tropical regions of the world. The word "mangrove" refers to the salt-tolerant trees that dominate these wetlands. In the U.S., they are mainly found on the southern tip of Florida and along the coasts of the Hawaiian Islands, although small mangrove stands are scattered as far north as Louisiana and Texas.

Tidal Freshwater Marshes form inland from salt marshes and mangrove swamps, but are still affected by ocean tides. Grasses and floating-leaved aquatic plants typically dominate these wetlands, which are found in bays, inlets, and along tidal rivers.

Functions and Values of Wetlands

ENVIRONMENTAL QUALITY

WATER QUALITY: Wetlands act as natural water purifiers, filtering sediment and absorbing many pollutants in surface waters. In some wetland systems, this cleansing function enhances the quality of groundwater supplies as well.



Wetland vegetation provides streambank stability Joel Wagner

SHORELINE AND STREAMBANK STABILIZATION: By absorbing the energy of storm waves and slowing water currents, wetland vegetation serves as a buffer against shoreline and riverbank erosion.

FLOOD CONTROL AND STREAMFLOW MAINTENANCE: Wetlands along rivers and streams store excess water during rainstorms. This reduces downstream flood damage and lessens the risk of flash floods. The slow release of this stored water to rivers and streams helps keep them from drying up during periods of drought.

EROSION CONTROL: Wetland vegetation binds the soil and slows the downstream movement of sediment.



The federally threatened bald eagle depends on wetlands for feeding grounds NPS Photo

PLANTS, FISH, AND WILDLIFE

WILDLIFE HABITAT: Wetlands provide habitat for many species of amphibians, reptiles, birds, and mammals that are uniquely adapted to wet environments. Upland wildlife such as deer, elk, and bear commonly use wetlands for food and shelter. Wetlands are particularly vital to many migratory bird species. For example, wood ducks, mallards, and sandhill cranes winter in flooded bottomland forests and marshes in the southern U.S., and prairie potholes serve as breeding grounds for over 50% of North American waterfowl.



Anhinga in Everglades National Park Joel Wagner

FISH AND SHELLFISH HABITAT: Freshwater and marine life including trout, striped bass, pike, sunfish, crappie, crab, and shrimp rely on wetlands for food, cover, spawning, and nursery grounds. Between 60% and 90% of U.S. commercial fisheries depend on wetlands.

HABITAT FOR THREATENED AND ENDANGERED SPECIES: About 35% of all plants and animals listed as threatened or endangered species in the United States depend on wetlands for survival, including the whooping crane, bald eagle, American crocodile, dwarf lake iris, and the eastern prairie fringed orchid.



Moose in Grand Teton National Park Harry Weddington, U.S. Army Corps of Engineers

SPECIALIZED PLANT HABITAT: Nearly 7000 plant species live in U.S. wetlands, many of which can only survive in these wet environments.



Bromeliads in a cypress swamp Joel Wagner

ECOSYSTEM PRODUCTIVITY: Some wetland types are among the most productive ecosystems on earth. A stand of common cordgrass in a salt marsh can produce more plant material and stored energy per acre than any agricultural crop except cultivated sugar cane. Nutrients and plant material flushed from some wetland systems during storms provide essential food for plants, fish, and wildlife in estuaries and other downstream ecosystems.

SOCIO-ECONOMIC FUNCTIONS AND VALUES

REDUCTION OF COASTAL STORM DAMAGE: Coastal wetlands help to blunt the force of major storms. Mangrove wetlands, such as those along shorelines in Biscayne National Park in Florida, reduce flooding, coastal erosion, and property damage.



Destruction of wetlands may lead to increased flooding in developed areas Joel Wagner



Canoeers prepare for a trip into a salt marsh NPS Photo

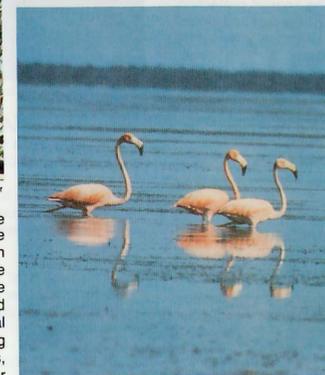
RECREATIONAL OPPORTUNITIES: Many wetlands contain a diversity of plants and animals that provide beautiful places for sightseeing, hiking, fishing, hunting, boating, bird watching, and photography.

WATER SUPPLY: Some wetlands help provide clean, plentiful water supplies. For example, wetlands in Florida's Everglades help recharge the Biscayne Aquifer, the sole source of drinking water for the Miami metropolitan area.

EDUCATION: Ecological, cultural, and historic resources run abundant in our nation's wetlands, and provide countless opportunities for environmental education and public awareness programs.

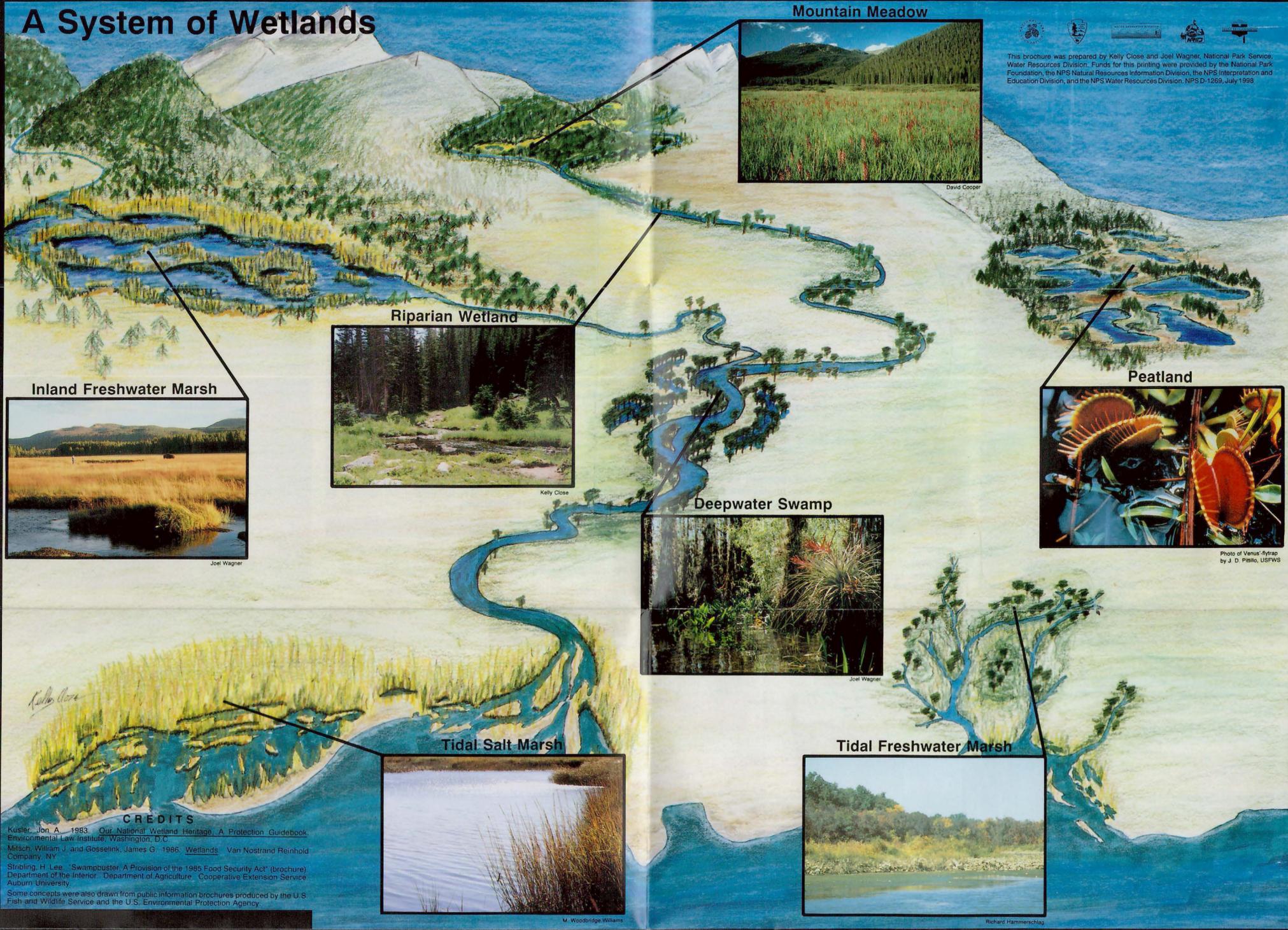


Wetlands provide environmental education and recreational opportunities NPS Photo

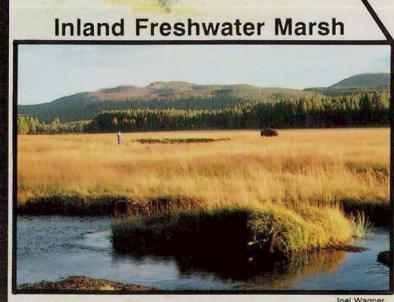


Flamingos feed in the Florida Bay estuary NPS Photo

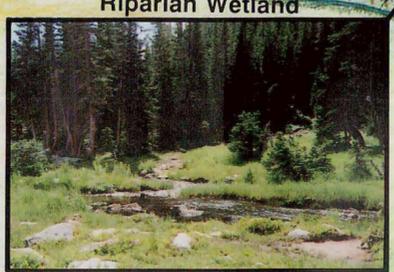
A System of Wetlands



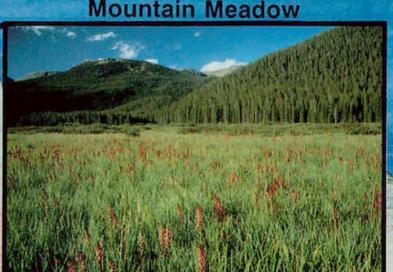
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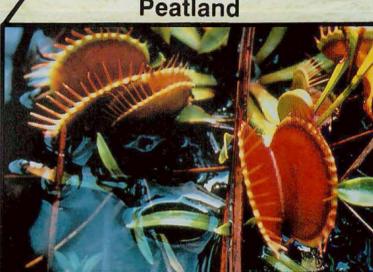
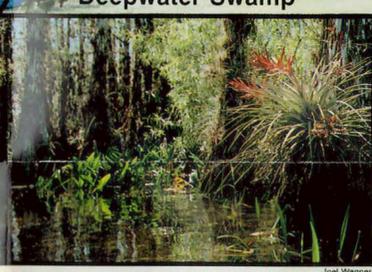
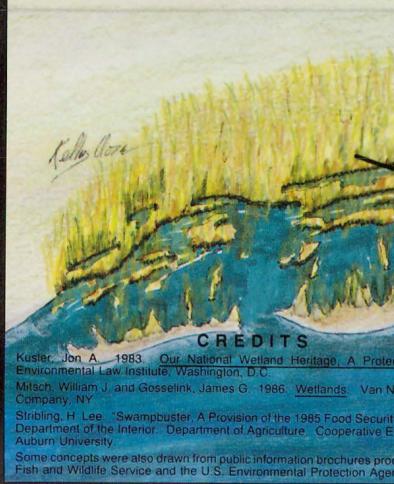


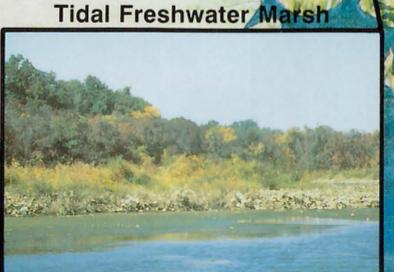
Photo of Venus Flytrap by J. D. Pielke, USFWS



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 Stribling, H. Lee. "Swampbuster, A Provision of the 1985 Food Security Act" (brochure). Department of the Interior, Department of Agriculture, Cooperative Extension Service, Auburn University.
 Some concepts were also drawn from public information brochures produced by the U.S. Fish and Wildlife Service and the U.S. Environmental Protection Agency.

Wetland Origins

Although some of our wetlands have been created in as short a span as a human lifetime, many others took thousands of years to develop.

FLOODING OF COASTAL LOWLANDS from gradually rising sea levels has created broad coastal marshes in areas protected from wave action by barrier islands, harbors, or reefs. Coastal wetlands also form when silt is carried down-river and deposited as it reaches the sea. Plants then take root and hold the soil deposits firm against the force of the tide.

RIVER FLOODPLAINS develop through erosion processes and through deposition of sediment on adjacent lands during floods. Wetlands form on floodplains where periodic flooding or high water tables provide sufficient moisture. These "riparian" wetlands may undergo constant change as rivers and streams form new channels and when floods scour the floodplain or deposit new material.

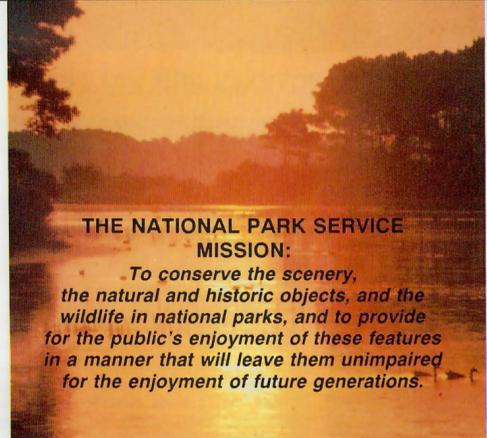
GLACIERS helped to create wetlands in the northern states 9,000-12,000 years ago. Large wetlands formed when glaciers dammed rivers, scoured valleys, and reworked floodplains. Countless smaller wetlands were created when large blocks of ice left behind by receding glaciers formed pits and depressions in the land. Many of these depressions later filled with water if they had poor drainage or intersected the water table.

BEAVERS once played a more significant role in forming smaller inland wetlands by damming rivers and streams. Though trapping has greatly reduced the number of beavers in the U.S., recent wildlife protection measures have resulted in recovery of beaver populations. Beaver dams may last in excess of 100 years, though many are shorter-lived.

OTHER FORCES OF NATURE can create wetlands. *Wind action* in the sand hills of Nebraska formed depressions, many of which have become wetlands. Wetlands may also form in "sink holes" and other areas where percolating water has dissolved bedrock. *Earthquakes* can create wetlands by damming rivers or causing land to drop down near the water table or shoreline. *Waterfalls* often have lush wetland vegetation under and around them, sustained by the spray.

PEOPLE create wetlands. Some "incidental" wetlands are formed when *highway and dam construction, irrigation projects*, or other human activities alter drainage patterns or impound water. In recent years, more and more government agencies, conservation groups, and individuals have been *intentionally* creating and restoring wetlands. Research is continuing to improve methods for replacing lost wetlands and the important functions and values associated with them.

The Role of the National Park Service



Joe Knecht, USFWS

THE NATIONAL PARK SERVICE MISSION:
 To conserve the scenery, the natural and historic objects, and the wildlife in national parks, and to provide for the public's enjoyment of these features in a manner that will leave them unimpaired for the enjoyment of future generations.

- The NPS uses up-to-date management techniques to preserve wetland functions and values. For example, in **Lake Mead National Recreation Area** in Nevada, removal of non-native plants allows native wetland species to flourish. In **Everglades National Park** in Florida, prescribed burning in certain wetland areas mimics natural fire regimes, sustaining the wetlands' natural processes while maintaining visitor safety.
- The amount of water needed to preserve wetlands in parks may be maintained through protection or acquisition of water rights. For example, at **Great Sand Dunes National Monument** in Colorado, the NPS claimed and was awarded a water right to the flow of a spring. The spring supports riparian resources used by park wildlife.

The NPS plays key roles in other local, state, and federal government wetlands-related programs, including the Rivers and Trails Conservation Assistance Program, the Wild and Scenic Rivers Program, and the preparation of State Comprehensive Outdoor Recreation Plans.



Prescribed burning in Taylor Slough, Everglades National Park, FL. Joel Wagner

RESEARCH AND RESTORATION

The NPS conducts research to determine how to protect and restore wetlands. For example:

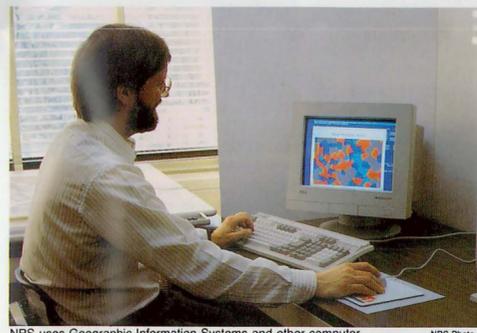
- At **Everglades National Park**, results of wildlife, hydrology, plant ecology, and marine science research support a massive project to protect and restore over 500,000 acres of critical tidal and non-tidal wetlands.
- Researchers at **Dinosaur National Monument** on the Utah-Colorado border are restoring a valuable riparian wetland habitat that had been ditched for irrigation.
- Reintroduction of natural tidal flows at **Cape Cod National Seashore** in Massachusetts will restore an important salt marsh ecosystem and permit the return of fish, shellfish, and shorebird populations.



Surveying wetland topography in Everglades National Park, FL. NPS Photo

- Riparian wetlands disturbed by gold placer-mining are being restored in **Denali National Park and Preserve** in Alaska.

Other NPS wetlands restoration projects include restoring the Turner River wetland system in the **Big Cypress National Preserve**, re-establishing tidal freshwater marsh vegetation at **Kenilworth Marsh** in Washington, D.C., and restoring water levels in the **Great Marsh** at **Indiana Dunes National Lakeshore**.



NPS uses Geographic Information Systems and other computer technology in wetlands management. NPS Photo

INTERPRETATION AND EDUCATION

The NPS plays an important role in boosting public awareness about wetlands by providing recreational opportunities, interpretive programs (nature walks and other natural history presentations), and public outreach programs.



Shipler Cabins guided walk in Rocky Mountain National Park, CO. NPS Photo

Trails and boardwalks in wetland areas at **Assateague Island National Seashore**, **Yellowstone National Park**, **Olympic National Park**, **Death Valley National Monument**, **Gateway National Recreation Area**, and many other parks provide unique opportunities for visitors to get a close-up look at wetland wildlife and vegetation. Many parks also have formal wetland interpretation programs, where naturalists offer insights into the complex but fascinating world of wetland ecology.

Some parks have even broader public education/outreach programs. **Everglades National Park** offers a community outreach program that brings school groups from south Florida to visit the park and learn first-hand about wetlands. **Cape Cod National Seashore** in Massachusetts conducts both school and public wetland programs. They include canoe and wading trips that explore the effects of water quality on aquatic life and how individuals can help protect our nation's wetlands.



Salt Creek Boardwalk, Death Valley National Monument, CA. NPS Photo