Ohio's WILD Wetlands!

OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF
WILDLIFE

A Project WILD Supplement

by the ODNR-Division of Wildlife

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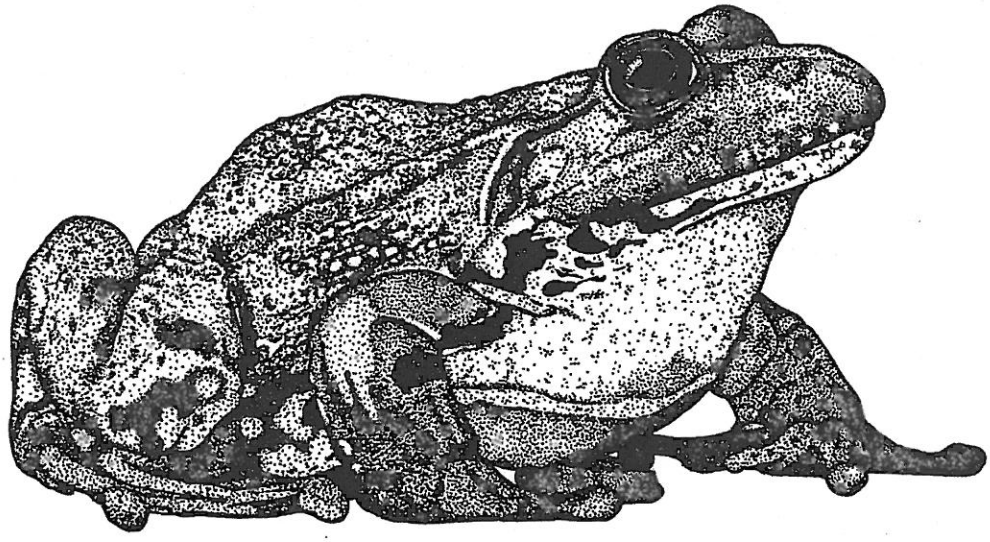

WETLAND INFORMATION

Updated 12/07

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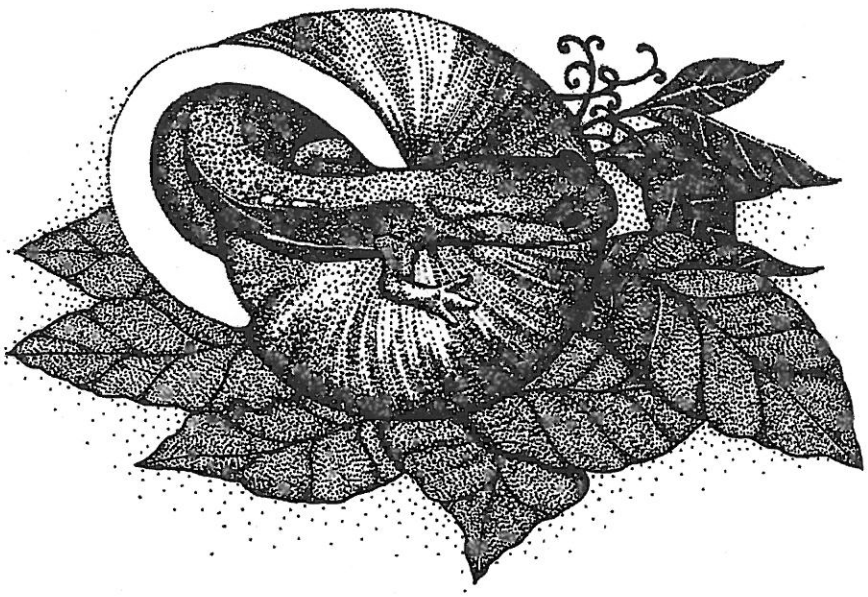
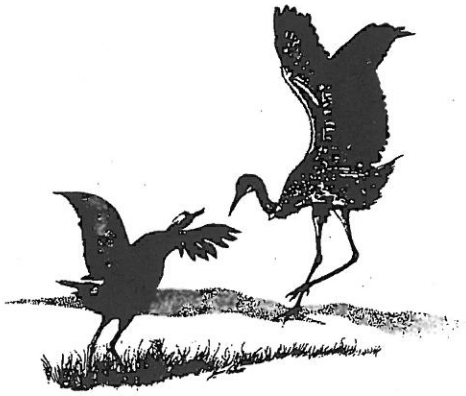


What are wetlands?



Wetlands are areas of ground that remain saturated with water for the majority of the year. Wetlands are normally found around rivers and lakes as well as coasts and river mouths. There are four main types of wetlands in Ohio. These include freshwater marshes, bogs, swamps, and fens.

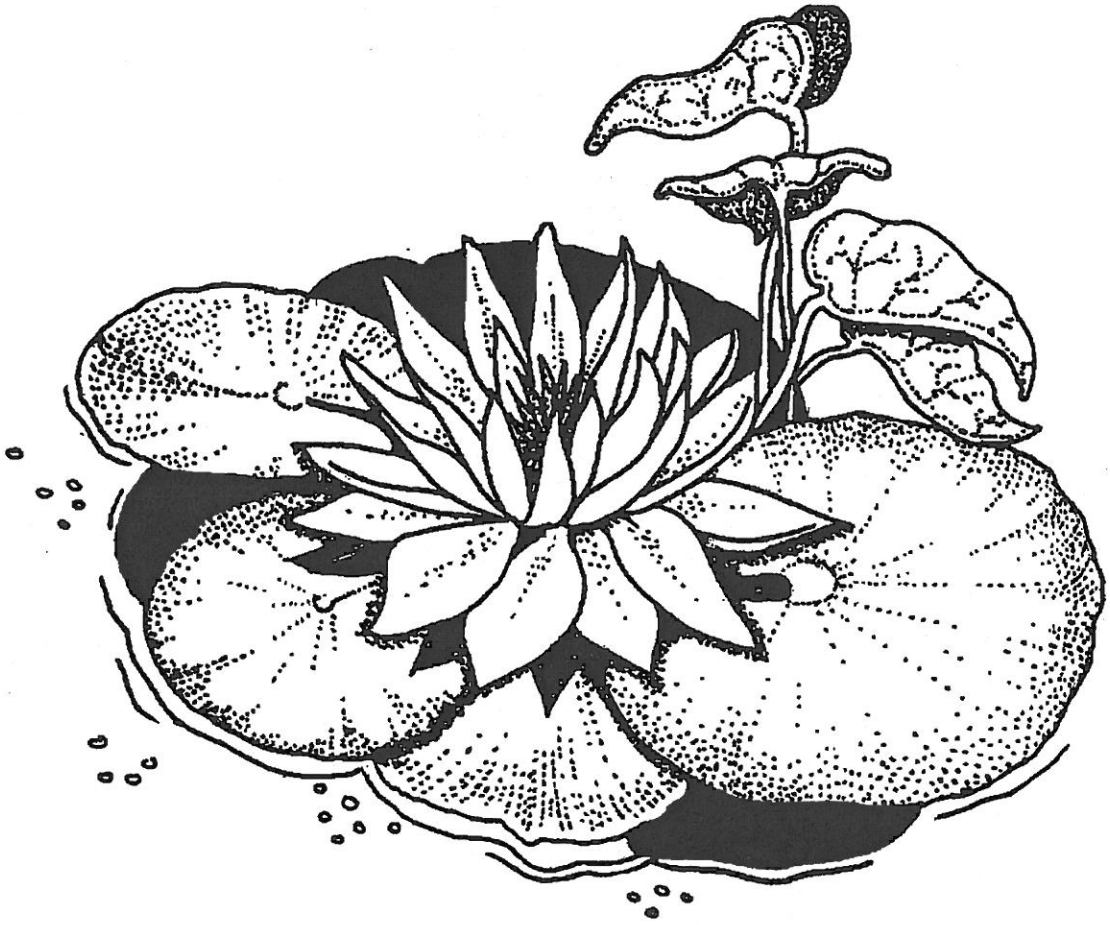
Freshwater marshes are found along the banks of rivers and streams, and in the shallow areas of ponds and lakes. Marshes are formed when a water source, such as a pond, starts to fill up with peat. **Peat** is formed as the plant debris in the pond settles to the bottom and starts to decay. As the water depth decreases because of filling layers, small, low-growing plants start to emerge. Soon cattails and water lilies fill in, as well as different types of tall grasses, such as sedges. The plants you'll find have roots in the water and their stems and leaves out of the water. While marshlands consist of mainly soft plants, there are a few trees and shrubs that reside by the water taking advantage of the rich soil and abundant water supply. Rainfall, underground springs, stream runoff, and melting snow runoff are the main water supply of freshwater marshes. Areas around a marsh also benefit from this collected water supply. The peat that forms the bottom layers of a marsh acts as a water supply table. This layer helps keep the ground from flooding because as water runs over the ground surface, the marsh acts as a sponge and soaks up the excess. As the rainy season ends and the dry season begins, water is slowly released from the table and nourishes the drier ground around it. Marshes range in depth from six inches to seven feet.

Bogs consist of saturated, spongy ground containing decaying vegetation and are found in mostly northern climates. This decaying vegetation, made up mainly of mosses, is in the form of peat. Most bogs have formed in the bucket, or bowl-like depressions that were left by the glaciers. And like a bucket, there is no drainage, so the water that is in this depression has been there for a long time and has gone stagnant. Most plants cannot survive in this stagnant water because the decaying plant life uses up the oxygen in the water. But mosses thrive there. Since peat forms the bottom of a bog, the ground is not solid and actually quakes when you walk on it. It is common to find carpets of sphagnum moss over a bog, but this should never be walked on because you could fall through to deeper waters. This stagnant water and abundance of decaying matter makes the bog environment very acidic. Bogs are known for the insect-eating plants that thrive in this acidic environment, such as pitcher plants, bladderwort, and sundew. Cranberries, blueberries, and peat are the primary resources produced by bogs.

Fens are very similar to bogs in that they are also found in more northern regions and they are also formed on peat. However, unlike bogs that have no drainage, fens have what is similar to a slow leak. Water flow in a fen is very slow, but it is enough to rinse out most of the acidity from the decaying mosses and peat. Since the acidity is not

present in fens, they can hold more plant life than bogs, such as grasses, sedges, willows, and cattails. Fens are also home to a variety of insect-eating plants.

Swamps are wooded wetlands that support conifers and deciduous shrubs and trees. Flooded rivers and streams form swamps in the spring. If a swamp is shallow enough, it may dry up by the end of summer, but the mud on your shoes while walking through a wooded area will tell you what is there. These smaller swamps are called vernal pools. These rich wetlands are home to a wide variety of plants and animals.



VISIT AN OHIO WETLAND

You can better enjoy your visit to an Ohio wetland when you know a little about these unique areas and the plants and animals that live there.

There are many kinds of wetlands in Ohio: bogs, fens, wet prairies, marshes, swamps, wet woods, and vernal pools. What they all have in common is that they have 1) water at or near the surface during some part of the growing season, 2) soils that lack oxygen, and 3) plants that are adapted to life in these saturated conditions.

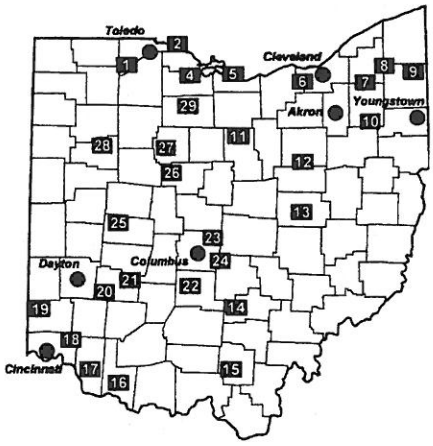
Once a prominent feature of the Ohio landscape, wetlands have been reduced to scattered fragments. Before European settlers came to Ohio, wetlands covered nearly one-fifth of the state. The Great Black Swamp of northwestern Ohio covered an area the size of the state of Connecticut. As population expanded, over 90 percent of the state's wetlands were drained or filled to allow for agriculture and development.

Wetlands are a very important part of our environment. They serve us well by storing excess storm water that would otherwise contribute to flooding; filtering sediment and other pollutants from our water; providing recreational opportunities like hunting, fishing, and birdwatching; and serving as habitat for many species of plants and animals.

There are many types of wetlands in Ohio, each of which has its own complement of plants and animals. One of the most common wetland systems in Ohio is the marsh. The edges of a marsh are constantly changing, depending upon weather conditions. Plants that grow in one area of a marsh in a dry year may be flooded in a wet year. This constant change is an important part of the marsh system and allows for an even greater diversity of plants and animals.

The following are just some of the many wetlands you can visit in Ohio. To find out about other areas near your home, call your nearest Metropark or local park district.

1. *Irwin Prairie SNP*
2. *Ottawa National Wildlife Refuge, US Fish &Wildlife Service*
3. *Magee Marsh WA*
4. *Pickerel Creek WA*
5. *Sheldon Marsh and Old Woman Creek SNP*
6. *Sanctuary Marsh, Baldwin Lake and Lake Isaac, Cleveland Metroparks*
7. *Tinkers Creek SNP*
8. *Grand River WA*
9. *Mosquito Creek WA*
10. *Frame Bog/J.A. Herrick Fen Kent State University/ The Nature Conservancy*
11. *Fowler Woods SNP*
12. *Killbuck Marsh WA*
13. *Woodbury WA*
14. *Greendale Swamp, Wayne National Forest*



WA—Wildlife Area managed by the ODNR, Division of Wildlife 1-800-WILDLIFE

SNP—State Nature Preserve managed by the ODNR, Division of Natural Areas and Preserves (614) 265-6453

15. *Cooper Hollow WA*
16. *Indian Creek WA*
17. *Crooked Run Nature Preserve, Clermont County Park District*
18. *Miami Whitewater Forest Park, Hamilton County Parks*
19. *Gillmore Ponds, Butler County Metro Parks*
20. *Spring Valley WA*
21. *Beaver Creek WA*
22. *Stages Pond SNP*
23. *Gahanna Woods SNP*
24. *Pickerington Ponds, Columbus Metro Parks*
25. *Cedar Bog, Ohio Historical Society*
26. *Big Island WA*
27. *Killdeer Plains WA*
28. *Kendrick Woods, Johnny Appleseed Metro Parks*
29. *Springville Marsh SNP*

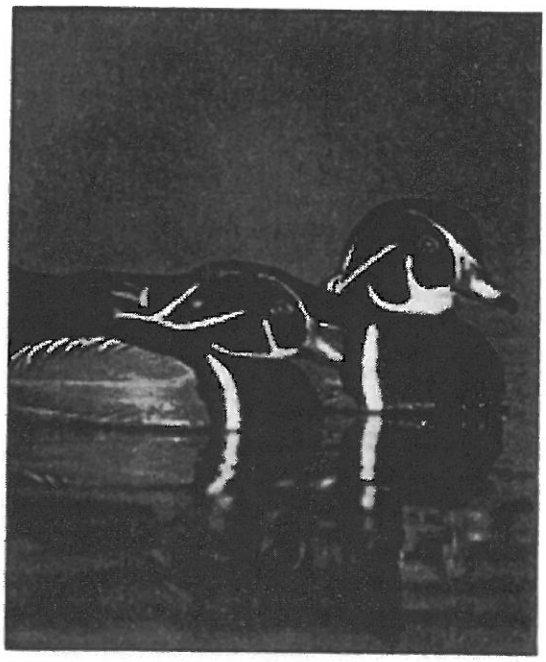
We hope that as your understanding and appreciation of wetlands grows, you will do your part to promote wise stewardship of these remarkable areas for future generations.

WETLAND FACT SHEET

- Over half of the original 220 million acres of wetlands in the lower 48 states have been destroyed and an additional 58,000 acres continue to be lost each year.
    - Over 90% of Ohio's wetlands have been lost.
- Wetlands support a wide variety of plant and animal populations that rely on the wetland for food, shelter, and reproduction. Many of these inhabitants are federally listed as threatened or endangered species.
    - In Ohio, ¼ of the plant species, ½ of the fish species, 2/3 of the bird species, and ¾ of the amphibian species that are listed as threatened or endangered in Ohio are associated with wetlands.
- Wetlands provide the principle habitat for virtually all waterfowl species. Some 75% of all waterfowl breed exclusively in wetlands.
- Wetlands are more important than water reservoirs. When water enters a wetland, the wetland acts as a purifier, cleaning the water before it exits. Wetlands do this by removing, retaining, and transforming nutrients, processing wastes, and trapping sediments.
- Most groundwater-related wetlands occur near the groundwater discharges that fill the body of water. In some instances, the wetlands provide water to streams that would dry up in the summer without the water in the wetland to sustain it.
- Some wetlands recharge aquifers that provide drinking water.
- Some wetlands, particularly those on floodplains and in coastal areas, function in flood control by storing excess water during storm events.
- Wetlands stabilize shorelines and prevent erosion by binding stream banks and by absorbing energy. Some wetlands also play an early and fundamental role in land building, particularly in coastal areas that regularly lose soil to wave erosion.
- Wetlands support a multi-billion dollar fishing, hunting, and wildlife watching industry nationwide, as they provide direct spawning and rearing habitat and food supply that supports both freshwater and marine wildlife.
- Wetland loss and degradation result from many causes. They can be divided into two categories:

Human Impacts	Natural Threats
Drainage	Erosion
Dredging and stream channelization	Subsidence
Deposition of fill material	Water level rise
Diking and damming	Drought
Overgrazing by domestic animals	Hurricanes and storms
Mining	Overgrazing by wildlife
Alteration of hydrology	

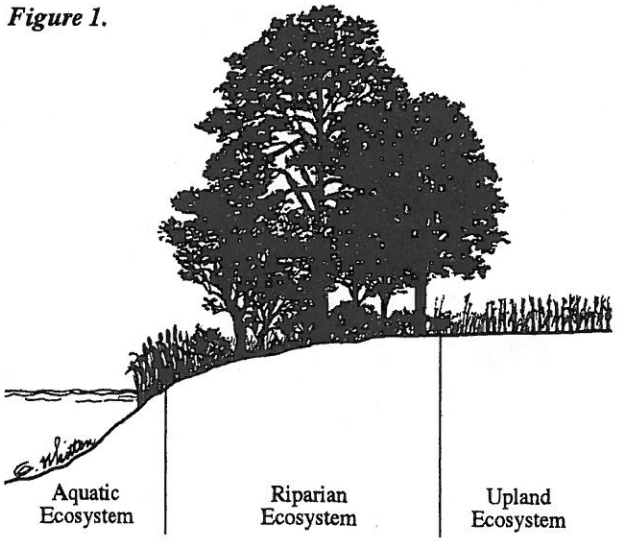
Riparian Habitat Management for Wildlife



Riparian habitat is the land and vegetation that is situated along the bank of a stream or river. Such an area is often referred to as a floodplain, streamside habitat, or bottomland forest. Because the topography is flat, it is subject to frequent seasonal flooding.

Plants commonly associated with riparian habitats include deciduous trees such as silver maple, red maple, sycamore, elm, cottonwood, box elder, buckeye, hackberry, willow, and river birch. Shrubs in the under-story layer of riparian woodlands include elderberry, bladdernut, wahoo, common alder, buttonbush, spicebush, silky dogwood, and red-osier dogwood. The ground cover is composed of flowering plants such as scouring rush, white snakeroot, waterleaf, jewelweed, nettles, and wingstem. See Figure 1.

Figure 1.



Riparian habitats are constantly shifting and changing in physical structure and plant composition due to the sometimes extreme forces exerted upon them by the fluctuating water levels of adjacent streams. As a result, riparian habitats can also be identified by the mixture of live and dead vegetation, especially the predominance of standing dead trees and ground cover debris such as logs and natural litter.

THE VALUES OF RIPARIAN HABITAT

Riparian habitat is one of the richest and most diverse habitat types in Ohio. Even though its dominant plant community is woodland, it usually contains a patchwork of smaller microhabitats such as buttonbush thickets, seasonal spring pools, sedge meadows, and cattail marshes. This mosaic of habitats, together with the surface water and abundant soil moisture, makes riparian land especially appealing to wildlife.

Riparian habitats offer many benefits to wildlife. They provide excellent travel corridors for safe movement between habitat types and promote the dispersal of wildlife populations. This benefit is particularly important to quail in western Ohio, because quail are somewhat limited in their ability to move to, seek out, and exploit surrounding available habitat. Habitats suitable for quail in western Ohio could be considered island oases in a vast cropland desert. Quail cannot reach these uninhabited islands without protected passageways. Riparian lands can provide these critical connecting access links for quail and other wildlife.

Riparian lands also supply an abundance of edge habitat that is spread out over a large area, making cover more accessible to wildlife. Riparian lands present two types of edges, each of which serve the needs of specific wildlife. The edge between the stream channel and vegetated bank is used by species such as the kingfisher, bank swallow, and prothonotary warbler. The edge formed by the merging of upland habitat, such as cropland and bottomland forest, is used by bobwhite quail and cottontail rabbits. The high density of trees with nesting cavities attracts several species of cavity nesters such as the pileated woodpecker and wood duck.

Riparian areas also serve as significant resting, feeding, and staging areas for waterfowl and other migrating birds. In some regions of Ohio, riparian habitat offers the only available habitat for migrating birds.

MANAGEMENT OF RIPARIAN HABITAT

Management of riparian areas involves protection, restoration, or both. It is extremely important that existing riparian habitats receive protection. An estimated two million acres of riparian habitat has been destroyed in Ohio since settlement. Like wetlands, riparian lands have been misunderstood and abused by the human community.

What caused the destruction of these riparian lands? Conversion to agricultural uses (cropland and pasture) has been the most damaging to riparian resources. Stream channel modification to improve cropland drainage by removing silt from the substrate and eliminating meanders is a major agricultural practice that has severely degraded both stream and streamside habitat. Industrial and residential develop-ment has also played a role.

Protection

Protection of riparian habitat is the first and best approach because it is less difficult and less costly to protect habitat than to rebuild degraded habitat. To provide quality habitat for riparian wildlife, a strip 125 feet or wider of riparian vegetation (preferably trees and shrubs) should be set aside and preserved along the water course. A minimum of 75 feet must be protected if water quality is to be maintained well enough to support a healthy aquatic community.

Protection may also require restricting livestock use of riparian land and eliminating logging operations.

Restoration

It is also important to try to regain some of what we have lost. This means restoring riparian sites that have been totally or partially destroyed.

Some sites can be restored by simply allowing them to revert naturally. This course of action requires you to discontinue any practice or land use such as mowing, pasturing, or cropping that hinder the development of woody plants. You must be willing to surrender some land and possibly some monetary profit for the cause of conservation. Keep in mind that short-term sacrifice can translate to long-term prosperity.

To speed the development of riparian habitat, you can plant various bottomland bare-root seedling stock. Riparian revegetation plans should aim to achieve high diversity and density of woody vegetation. The types of trees and shrubs to select will depend on soil type and geographic location. It is best to use native woody plants for restoring streamside habitat. These plants are recommended: hardwood trees such as sycamore, sweet gum, green ash, cottonwood, hackberry, box elder, and silver maple, and shrubs such as silky dogwood, common alder, and red-osier dogwood. The tree seedlings should be placed 10 feet apart within the row and the rows should be 10 feet apart. Shrubs can be intermixed with the hardwood seedlings at five-foot spacings. Alternate species as you plant them.

Bottomland hardwood bare-root seedlings can be purchased in large numbers from the Division of Forestry. Landowners can check for cost share programs for riparian tree and shrub plantings with their local Farm Service Agency (FSA). Many USDA set-aside programs target establishing riparian corridors for water quality benefits.

Competition from existing vegetation (especially sod forming grasses) can hinder riparian reestablishment. Therefore, it is recommended that you spray two- to three-foot wide bands of herbicide approximately 10 feet apart. Apply the herbicide during the fall growing season, preferably in September. (The trees and shrubs will be planted in the center of these sprayed strips.) The first band should be applied at least 10 feet away from the crest of the stream bank. Be careful not to allow overspray to drift into the stream channel. Herbicide application is not necessary in bean or corn stubble fields. Simply plant the trees directly into the stubble. Try to minimize soil disturbance so as not to encourage the growth of annual weeds. Mowing or spraying directly around each seedling may be required until the plants have cleared the competing weed growth. Contact the OSU Extension Service Office for more information on herbicide selection and use.

Plant the trees and shrubs in the spring between March 15 and May 1. Refer to the *Planting Trees and Shrubs for Wildlife* publication for more details on care of seedlings before planting, planting methods, and post-planting maintenance.

The methods described above can also be applied to expand existing riparian strips that are too narrow to furnish quality stream or streamside habitat.

If your stream bank is eroding severely, please refer to the series of publications that deal specifically with stream bank stabilization. Tree revetments, dormant willow post cuttings, and tree deflectors are required to remedy severe stream bank erosion. Once these problems have been taken care of, you can proceed with restoring the remaining riparian habitat.

OHIO DIVISION OF WILDLIFE

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OHIO DEPARTMENT OF NATURAL RESOURCES

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EPA
United States
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Wetlands Overview

Dave Davis

Is there a wetland in your neighborhood?

The best way to find out if there's a wetland in your watershed or neighborhood is to contact your Natural Resources Conservation Service office or local public works or planning department. Most have specialists trained in identifying and delineating wetlands. The U.S. Fish and Wildlife Service's National Wetland Inventory maps can also help. The maps indicate open water and likely wetland areas. For copies, call 1-888-ASK-USGS or visit the National Wetlands Inventory web site at www.nwi.fws.gov.

What Is a Wetland?

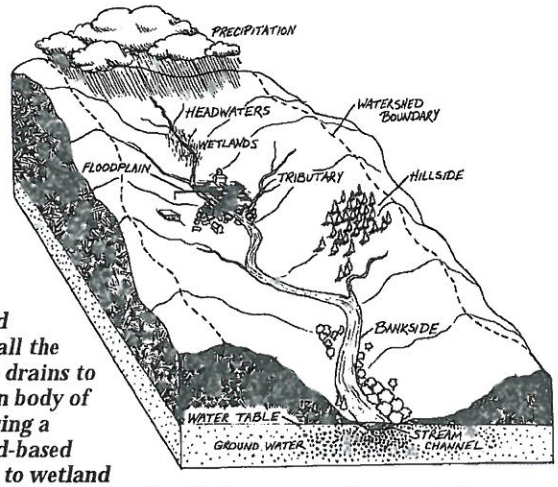
Although wetlands are often wet, a wetland might not be wet year-round. In fact, some of the most important wetlands are only seasonally wet. Wetlands are the link between the land and the water. They are transition zones where the flow of water, the cycling of nutrients, and the energy of the sun meet to produce a unique ecosystem characterized by hydrology, soils, and vegetation—making these areas very important features of a watershed. Using a watershed-based approach to wetland protection ensures that the whole system, including land, air, and water resources, is protected.

Wetlands found in the United States fall into four general categories—marshes, swamps, bogs, and fens. Marshes are wetlands dominated by soft-stemmed vegetation, while swamps have mostly woody plants. Bogs are freshwater wetlands, often formed in old glacial lakes, characterized by spongy peat deposits, evergreen trees and shrubs, and a floor covered by a thick carpet of sphagnum moss. Fens are freshwater peat-forming wetlands covered mostly by grasses, sedges, reeds, and wildflowers.

Although wetlands are best known for being home to water lilies, turtles, frogs, snakes, alligators, and crocodiles, they also provide important habitat for waterfowl, fish, and mammals. Migrating birds use wetlands to rest and feed during their cross-continental journeys and as nesting sites when they are at home. As a result, wetland loss has a serious impact on these species. Habitat degradation since the 1970s has been a leading cause of species extinction.

Good News

Often called "nurseries of life," wetlands provide habitat for thousands of species of aquatic and terrestrial plants and animals.



A watershed includes all the land that drains to a common body of water. Using a watershed-based approach to wetland protection ensures that the whole ecosystem is protected.

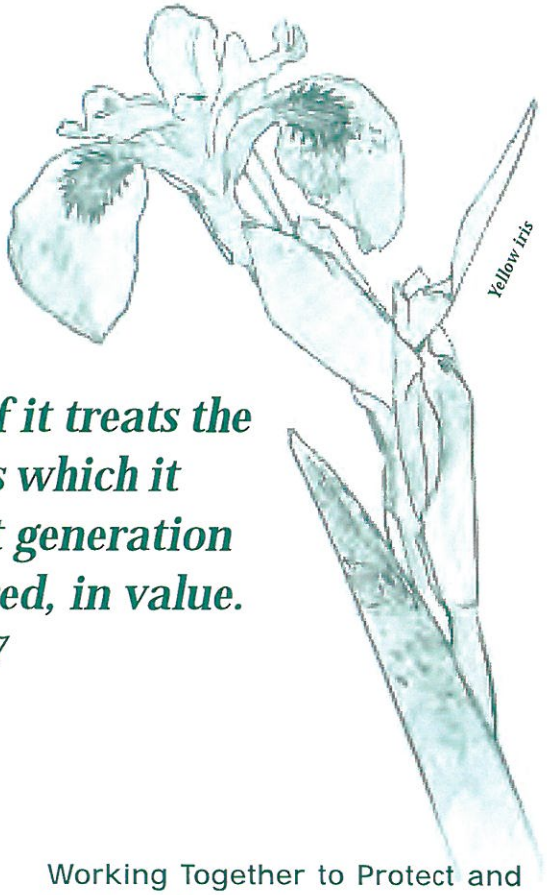
Two-thirds of the 10 million to 12 million waterfowl of the continental United States reproduce in the prairie pothole wetlands of the Midwest. In the winter millions of ducks like these can be found in the wetlands of the south-central United States.

Dave Davis

This forested wetland on the Chincoteague National Wildlife Refuge on Virginia's Eastern Shore is part of the Atlantic flyway, where shorebirds and waterfowl rest before they migrate south for the winter.

Dave Davis

A freshwater pool at Assateague National Seashore in Virginia.



Yellow iris

The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value.

—Theodore Roosevelt, 1907

Living systems cleanse water and make it fit, among other things, for human consumption.

Elliot A. Norse, in R.J. Hoage, ed., *Animal Extinctions*, 1985, Smithsonian Press.

Wetlands do more than provide habitat for plants and animals in the watershed. When rivers overflow, wetlands help to absorb and slow floodwaters. This ability to control floods can alleviate property damage and loss and can even save lives. Wetlands also absorb excess nutrients, sediment, and other pollutants before they reach rivers, lakes, and other waterbodies. They are great spots for fishing, canoeing, hiking, and bird-watching, and they make wonderful outdoor classrooms for people of all ages.

Bad News

Despite all the benefits provided by wetlands, the United States loses about 60,000 acres of wetlands each year. The very runoff that wetlands help to clean can overload and contaminate these fragile ecosystems. In addition, nonnative species of plants and animals and global climate change contribute to wetland loss and degradation.

What Is EPA Doing to Protect Wetlands?

EPA has a number of programs for wetland conservation, restoration, and monitoring. EPA, along with the U.S. Army Corps of Engineers (Corps), establishes environmental standards for reviewing permits for discharges that affect wetlands, such as residential development, roads, and levees. Under Section 404 of the Clean Water Act, the Corps issues permits that meet environmental standards (after allowing the public to comment).

Working Together to Protect and Restore Wetlands

In addition to providing regulatory protection for wetlands, EPA works in partnership with states, tribes, and local governments, the private sector, and citizen organizations to monitor, protect, and restore these valuable habitats. EPA is helping states and tribes incorporate wetland monitoring, protection, and restoration into their watershed plans. EPA is also developing national guidance on wetland restoration, as well as constructed wetlands used to treat storm water and sewage. Nationally, EPA's Five-Star Restoration Program provides grants and promotes information exchange through community-based education and restoration projects.

EPA works with a variety of other federal agencies to protect and restore wetlands, including the U.S. Fish and Wildlife Service, the U.S. Department of Agriculture, and the National Marine Fisheries Service. EPA is working with these agencies and others to achieve an overall increase of wetlands over the next five years. EPA also partners with private interests and public organizations like the Association of State Wetland Managers, the National Association of Counties, local watershed associations, schools, and universities to advance conservation and restoration programs.

How Can I Help?

First, identify your watershed and find the wetlands in your neighborhood. Learn more about them and share what you learn with someone you know! Encourage neighbors, developers, and state and local governments to protect the functions and values of wetlands in your watershed.

To prevent wetland loss or degradation, follow these simple guidelines:

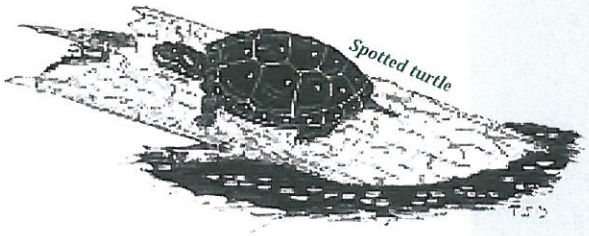
- Invest in wetlands by buying duck stamps. Proceeds from these $15 migratory bird hunting stamps support wetland acquisition and restoration. The stamps are available on-line at the U.S. Fish and Wildlife Service's web site (www.fws.gov) or at your local post office.
- Instead of draining or filling wetlands, find more compatible uses, such as waterfowl and wildlife habitat.
- When developing your landscaping plan, keep wetlands in mind. Plant native grasses or forested buffer strips along wetlands on your property to protect water quality.
- Participate in a volunteer wetland monitoring program.
- Plan to avoid wetlands when developing or improving a site. Get technical assistance from your state environmental agency before you alter a wetland.
- Maintain wetlands and adjacent buffer strips as open space.
- Support your local watershed association.
- Plan a wetland program or invite a wetland expert to speak at your school, club, youth group, or professional organization.
- Build a wetland in your backyard. Learn how by visiting the U.S. Department of Agriculture's web site at www.nrcs.usda.gov/feature/backyard/

Dave Davis

Wetland habitat along this Idaho riparian corridor provides food and shelter for diverse wildlife species.

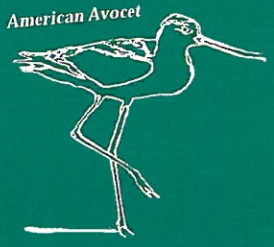
Dave Davis

If bottomland hardwood swamps are protected, Bald Cypress trees like these can grow for more than 2000 years.



Wetlands can be found in every county and climatic zone in the United States.

EPA 843-F-04-011a
Office of Water
December 2004



Wetland Resources

On the Internet

EPA's Wetland Home Page ..... www.epa.gov/owow/wetlands

USDA's Wetland Reserve Program ..... www.nrcs.usda.gov/programs/wrp

The Association of State Wetland Managers ..... www.aswm.org

National Marine Fisheries Service Restoration Center ..... www.nmfs.noaa.gov/habitat/restoration

USDA NRCS's Wetland Science Institute ..... www.pwrc.usgs.gov/WLI

National Wetlands Inventory Center ..... www.nwi.fws.gov

Izaak Walton League ..... www.iwla.org

U.S. Fish and Wildlife Service ..... www.fws.gov

Army Corps of Engineers ..... www.usace.army.mil

USGS National Weltands Resources Center ..... www.nwrc.usgs.gov

U.S. Forest Service ..... www.usda.fs.gov

In Print

America's Wetlands: Our vital link between land and water. Available on the Internet at www.epa.gov/owow/wetlands/vital/toc.html.

Our National Wetland Heritage: A Protection Guide, Jon Kusler and Teresa Opheim. Available from the Association of State Wetland Managers. Call (518) 872-1804 or visit www.aswm.org.

Wetlands, 3rd edition, William J. Mitsch and James G. Gosselink. Available from the Association of State Wetland Managers. Call (518) 872-1804 or visit www.aswm.org.

History of Wetlands in the Conterminous United States: National Water Summary on Wetland Resources, U.S. Geological Survey Water Supply Paper 2425. Available from the U.S. Fish and Wildlife Service at wetlands.fws.gov/bha or from the U.S. Geological Survey at water.usgs.gov/nwsum/WSP2425/history.html.

National Wetlands Status and Trends Study and Report for the Year 2000. Available from the U.S. Fish and Wildlife Service at wetlands.fws.gov/bha.

Recognizing Wetlands. Available from the U.S. Army Corps of Engineers at www.wes.army.mil/el/wetlands.

EPA United States Environmental Protection Agency

Water: Wetlands

You are here: Water » Our Waters » Wetlands » Wetlands - Status and Trends

Wetlands - Status and Trends

Draining Wetlands for Irrigation

Current Situation

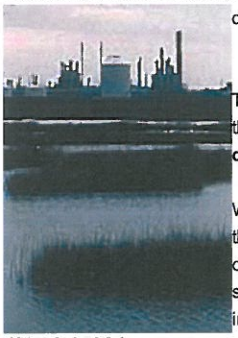
The lower 48 states contained an estimated 110.1 million acres of wetlands in 2009.[1] This is an area about the size of California. In 1994, an estimated 174 million acres of wetland existed in Alaska[2] -- covering nearly half of the state-- while Hawaii had 52,000 acres as of the 1980s.[3] Next to Alaska, Florida (11.4 million),[4] Minnesota (10.6 million),[5] Louisiana (7.8 million),[6] and Texas (7.6 million)[7] have the largest wetland acreage.

In the 1600s, over 220 million acres of wetlands are thought to have existed in the lower 48 states.[8] Since then, extensive losses have occurred, and over half of our original wetlands in the lower 48 have been drained and converted to other uses.[9] The years from the mid-1950s to the mid- 1970s were a time of major wetland loss, but since then the rate of loss has decreased.

Between 2004 and 2009, an estimated 62,300 acres of wetlands were lost in the conterminous United States.[10] Various factors have contributed to the decline in the loss rate including implementation and enforcement of wetland protection measures and elimination of some incentives for wetland drainage. Public education and outreach about the value and functions of wetlands, private land initiatives, coastal monitoring and protection programs, and wetland restoration and creation actions have also helped reduce overall wetland losses.

Percentage of Wetlands Acreage Lost, 1780's-1980's

In addition to these losses, many other wetlands have suffered degradation of functions, although calculating the magnitude of the degradation is difficult.



Siting Industrial Operations in a Wetland

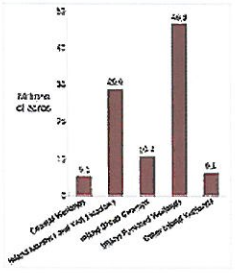
These losses, as well as degradation, have greatly diminished our nation's wetlands resources; as a result, we no longer have the benefits they provided. **The increase in flood damages, drought damages, and the declining bird populations are, in part, the result of wetlands degradation and destruction.**

Wetlands have been degraded in ways that are not as obvious as direct physical destruction or degradation. Other threats have included chemical contamination, excess nutrients, and sediment from air and water. Global climate change could affect wetlands through increased air temperature; shifts in precipitation; increased frequency of storms, droughts, and floods; increased atmospheric carbon dioxide concentration; and sea level rise. All of these impacts could affect species composition and wetland functions.

Peat Mining in a Wetland/Montana

Major Causes of Wetland Loss and Degradation

Extent of Wetlands in the Lower 48 States



Human Actions

- Drainage
- Dredging and stream channelization
- Deposition of fill material
- Diking and damming
- Tilling for crop production
- Levees
- Logging
- Mining
- Construction
- Runoff
- Air and water pollutants
- Changing nutrient levels
- Releasing toxic chemicals
- Introducing nonnative species
- Grazing by domestic animals

Natural Threats

- Erosion
- Subsidence
- Sea level rise
- Droughts
- Hurricanes and other storms

Resources

- Wetlands Status and Trends Reports: The U.S. Fish and Wildlife Service publishes a variety of national, state, and regional reports to track and estimate the status and trends of wetland extent in the United States.
- National Resources Inventory: The NRI is conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service, in cooperation with the Iowa State University Statistical Laboratory. The NRI is a statistical survey of land use and natural resource conditions and trends on U.S. non-Federal lands, including wetlands.

Footnotes

1. Dahl, T.E. 2011. *Status and Trends of Wetlands in the Conterminous United States 2004 to 2009.* U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 108 pp. http://www.fws.gov/wetlands/Status-And-Trends-2009/index.html.
2. Hall, Jonathan V., W.E. Frayer, and Bill O. Wilen. 1994. *Status of Alaska Wetlands.* U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 36 pp. http://www.fws.gov/wetlands/Documents/Status-of-Alaska-Wetlands.pdf. (PDF) (36 pp, 5.5 MB)
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7. Dahl 1990.
8. *Ibid.*
9. *Ibid.*
10. Dahl 2011.

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Last updated on Thursday, January 24, 2013

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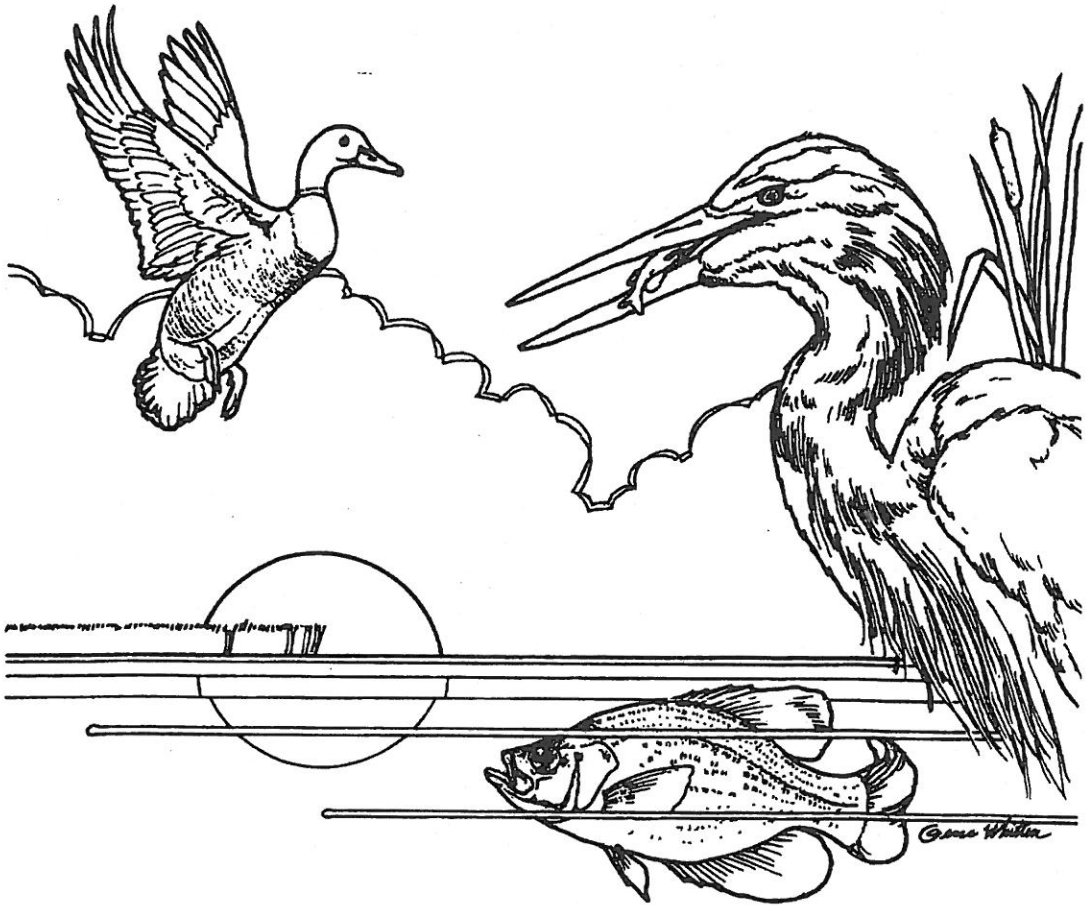
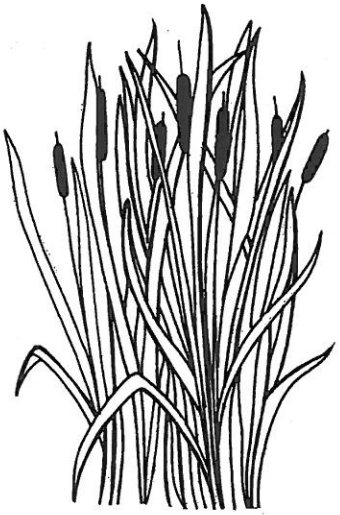
- ***Wetland Plants***
- ***Wetland Mammals, Birds, Reptiles, and Amphibians***
- ***Division of Wildlife Life History Notes***
  Common Carp, Largemouth Bass, Bluegill Sunfish, Pumpkinseed Sunfish, Sandhill Crane, Bald Eagle, River Otter, Trumpeter Swan
- ***Exotic Aquatics: Invasive Plants and Animals***



Wetland Plants

Duckweed is one of the most important plants found in wetlands. These tiny green floating plants live up to their name. They are an important food source for waterfowl as well as other animals such as carp, turtles, frogs, and other amphibians. Beavers and muskrats are probably the only mammals that consume duckweed, and they also help distribute it. The tiny plants get caught in their matted fur and when they travel to other ponds or slow-moving water sources, the duckweed goes with them and starts a new colony. Duckweed has a small, flat plant body, called a thallus, and has anywhere from one to ten dangling roots. These plants reproduce by "budding" off and can rapidly produce a green carpet across a pond. Duckweed is the smallest of flowering plants, even though they rarely produce a flower.



The **cattail** is one of the most abundant and recognizable wetland plants. These plants grow in colonies by the water's edge, and like the duckweed, also reproduce and spread rapidly. Each spike on a cattail plant has an estimated 220,000 seeds. Cattails are essential to the survival of several animal species. The Clubiona spider folds a leaf tip down, making an enclosure, and then lays her eggs. The pocket will be used as a coffin as well as a nursery, because the mother spider dies after she lays the eggs, and her body is the first nourishment her young will have. Several insects feed on cattails, such as aphids, larvae of many moth species, stalk borers, pillbugs, water beetles, etc. With the numerous species of birds that thrive on wetlands, it is not surprising that many rely on cattails. Marsh wrens, swamp sparrows, and red-winged blackbirds suspend their nests in the thick colonies of cattails. Ducks and other waterfowl nest along the outer edges of the growth. The dead leaves, stems, and cattail down are used by many species of wetland birds for nest-building material. Cattails also have many human uses. The seed pods can be boiled and eaten like corn, and can also be used to stuff lifejackets. Native Americans used the reeds and stems to weave baskets, and make chairs. Cattails are also great water filters. That is one of their main functions in a wetland.

The **arrowhead plant** is easily recognized because the leaves are shaped like an arrowhead. The leaves are found on different stems than the three-petal flowers. Arrowhead is a highly adaptable plant, with its leaves being narrow and ribbon-like when submerged in water, and broad and flat when beached on a mud bank. It produces starchy tubers in its roots, which can be dug up and prepared like potatoes. Arrowhead occurs naturally in wetland areas, but is restricted from most reservoirs. This plant takes in a great amount of water vapor, more than most green plants of its

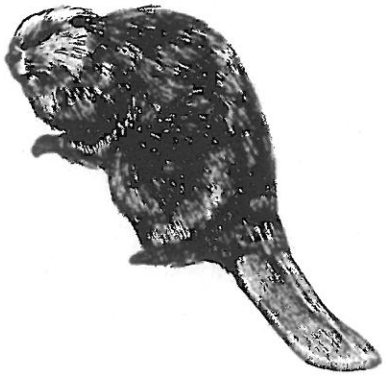
size, and great quantities of arrowhead have been known to lower the water levels.

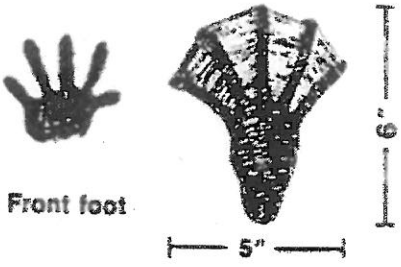
Pickerelweed is identified by its three-inch violet-blue flower spikes that bloom all summer. It also has arrowhead-shaped leaves. However, unlike the arrowhead plant, there is only one leaf and the base is rounded. This herb can be found in marshes, and in the shallow waters of ponds, lakes, and streams. The seeds of the pickerelweed plant are its most notable resource. They are eaten by surface-eating waterfowl, such as American black ducks, mallards, wood ducks, and common pintails, to name a few. The leaves and seeds are also edible and nutritious to humans. The young leaves are good for salads or cooked for greens and the seeds can be eaten off the plant or dried then ground into flour.

The **swamp rose** is the only wetland rose species. It is closely related to raspberries and blackberries, and meadowsweet. Swamp rose is a primary food source for many insects including the sting rose caterpillar, Japanese beetles, European earwigs, and rose chafers. This plant is also important to various bird species. Gray catbirds, northern mockingbirds, brown thrashers, yellow warblers, and northern cardinals all favor swamp rose thickets for nesting sites. Swamp rose produces a scarlet fleshy fruit called a rose hip. Rose hips are high in vitamins and low in fat. Three rose hips contain as much vitamin C as an orange and 60 times more than a lemon. Rose hips can be made into a beverage when used in quantity, or mixed with apple in a jam. Petals, when used fresh, can be eaten raw, candied, or jellied. The swamp rose also has medicinal uses. Native Americans used the petals, bark, roots, and leaves in teas and tonics.

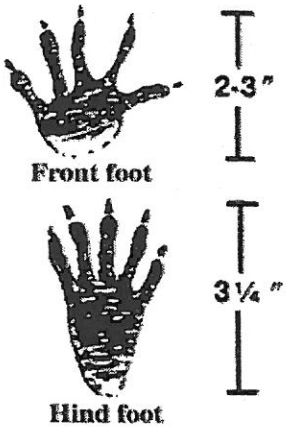
Sedges are one of the most misidentified wetland plants. They are often confused with grasses. The best way to remember the difference is sedges have edges, and grasses are round. The sedge stem ranks pretty low on the wetland food list, but the seeds are an important food source. Ring-necked pheasants, ruffed grouse chicks, wild turkeys, finches, larks, and American tree sparrows are just a few of the birds that feed on sedge seeds. Sedges are best known for the habitat cover that they provide. Sedge mats are a favored habitat for frogs, turtles, and snakes. Bluegill and bass can also be found nesting at the base of the mats.

Wetland Mammals



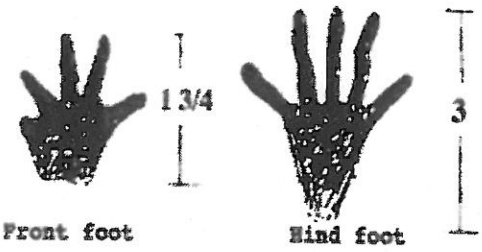


Native only to North America, the **beaver** leaves the easiest signs for even a new tracker to identify. These brown-haired rodents are often identified in lakes and ponds slapping their wide, flat tails on the water as a warning. However, the most prominent signs are beaver lodges. The dome-shaped construction is located at depths of three feet or more, and is around 20 feet wide at the base and ranges from six to ten feet high. Poplar, willow, cottonwood, basswood, and birch are all favorite trees used by beavers to construct lodges as well as dams. Beavers also eat the wood, but only the bark of the younger, smooth-barked trees. Another sure sign that a beaver family is around are "cuttings." An average adult beaver can fell a 30-foot cottonwood tree, 10 inches in diameter in about six minutes, leaving the characteristic cone-shaped stump behind. Beavers were once rare in the United States due to unregulated trapping by fur traders seeking their lustrous waterproof pelts. But now, thanks to regulations and habitat management, these animals have made a remarkable comeback. Opportunities to trap beaver continue to grow in central and western Ohio and remain strong throughout eastern Ohio.

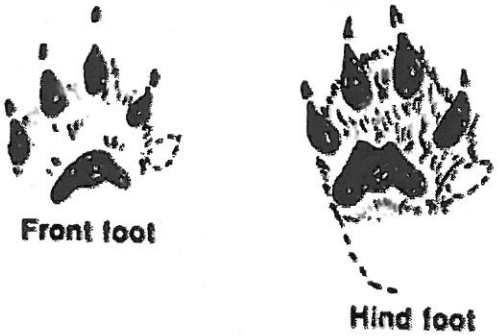


The **raccoon** can be identified by the black and white-ringed, bushy tail, and the notorious black mask that frames its face. This masked bandit is one of the most clever wetland animals and can adapt to almost any environment. Raccoons are omnivores that will eat almost anything. They are most commonly found along the water's edge searching for crawfish, frogs, snakes, tadpoles, clams, insects, and berries. Raccoons are commonly pictured at the waterside "washing" their food. However, raccoons do not really wash their food; they are merely searching for any indigestible items, such as bones, pits, and seeds by tearing the item apart.

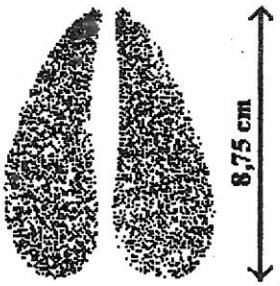
The **muskrat** is a reddish-brown rodent with a light gray belly and a black, scaly tail. Although it is often compared to the beaver because of lifestyle and lodging, the muskrat is more closely related to the vole or rat. That is how it got its name. The first part comes from the musky odor that its glands give off. It is easy to tell if there is a muskrat in the area by the clues they leave behind. The muskrat spends much of its time gathering plants to eat, and much of the clippings get left in the water. They also burrow dens in the side of mud banks, as well as build lodges, much like a beaver's, but smaller. Floating rafts built from rushes, grass, cattail leaves, and sticks are a sure sign that muskrats are in the area. While muskrats are known for the plants they eat, they also consume crayfish, insects, clams, and frogs.

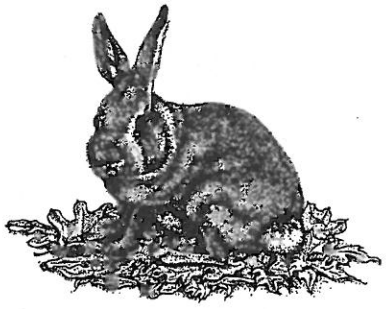


Mink were once one of the most sought-after fur-coated mammals. The brown, silky fur is made into fur coats for humans to wear. This long-bodied member of the weasel family is an excellent swimmer and preys on both terrestrial and aquatic animals including muskrats, rabbits, fish, and snakes. Mink have a tendency to always move about. They are hunting, fishing, playing, or on the move. Because of this, it is not often that you will find a mink den. But frequently, mink will find shelter in muskrat dens. The four-inch diameter holes can easily be missed, but look for clues like scraps of fur and bone, fish skulls, feathers and eggshells scattered around the entrance.



You are walking along the swamp edge and all of a sudden you hear twigs cracking and see what looks like a white flag bounding off into the distance. That was a **white-tailed deer**. Deer stand four and a half to seven feet tall, and are reddish brown in color with white along their underbelly, nose, around their eyes, and under their tail. Dawn and dusk are the best time to see white-tailed deer when they come out to forage for plants. Their diet ranges from clover, grasses, and water plants in the spring and summer to tree bark and dead grass in the winter. The leaves and stems that are left behind make it apparent that a deer has been there because of the ragged edges. Deer lack upper incisors and to bite off plants, they must clamp the food between the hard pallets at the top their mouth and their lower incisors. In addition to stripping bark from trees for food, it is also stripped from bucks rubbing their antlers on the tree trunk. This is to mark their territory and to get rid of the velvet covering that nourishes the antlers during growth. Contrary to popular belief, the number of points, or tines, on a rack is not just due to age, but a combination of age and how nutritious the deer's diet is that year.





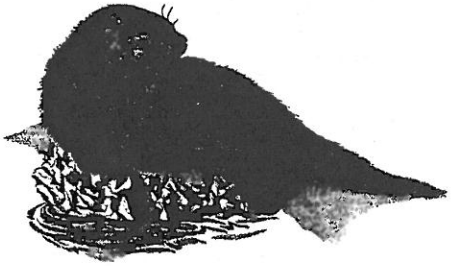
Eastern cottontail rabbits have the widest range of any rabbit in the U.S. Their gray and brown coat is perfect camouflage in most surroundings, and their characteristic white tail is noticeable when the startled rabbit is running. The cottontail is often confused with the snowshoe hare, which in the summer also has a gray-brown coat. However, hares have longer back legs that are used for leaping. Rabbits have shorter legs for running. Also, rabbit young are born naked and blind, while hares are born with eyes open and have hair on their bodies. Cottontail rabbits have weak eyesight and rely on their keen hearing and sense of smell to sense danger. An interesting trait of the eastern cottontail is its tendency to run in a circle, 50 to 100 yards, when pursued by a predator. Because of its short-ranged sprinting speed, it will try to find cover to hide in quickly; however, if the pursuer is too close the rabbit will retrace its own tracks and try to confuse the predator.

FRONT

HIND

Black bears symbolize freedom and wilderness in the United States. They are also one of the most misunderstood animals. Images range from huge vicious man-eaters to the soft and cuddly teddy bear named for Theodore Roosevelt. In actuality while bears should not be portrayed as a toy, they are not a threatening danger to humans either. Most bears are omnivores, which means they eat meat and vegetation. Black bears eat insects, small rodents, grasses and berries to name a few. Black bears are about three feet high at the shoulders and are four and a half to five feet long from head to tail. Despite their name, these bears can range from black to brown or cinnamon and even white. Bears do not hibernate. True hibernation requires the body temperature to drop to the same temperature as the outside air. The body temperature of a black bear drops just a few degrees as the bear falls into a deep sleep.

River otters are a great example of a wildlife management success story. These large members of the weasel family were once extirpated from the state. From 1988-1991, otters were trapped in Louisiana and brought to Ohio and reintroduced into five watersheds in eastern Ohio. Since then, otters have rapidly expanded their population and range throughout Ohio so that they are now found in over 40 watersheds across the state. In fact, they are so numerous that the Division of Wildlife was able to remove them from the endangered species list in 2000. So in just over two decades, Ohio went to having no river otters to abundance. This is truly a remarkable occasion and part of the most successful predator reintroduction program in the country. These seemingly playful animals are true predators, feeding on fish, crayfish, frogs, snakes and other aquatic animals. Otters are usually found near areas heavily populated with beavers. Otters use old beaver dens in river banks and sand bars for shelter. In the winter, you can find signs of otters by looking for their slides on river banks or checking for tracks along shorelines under bridges and overpasses.



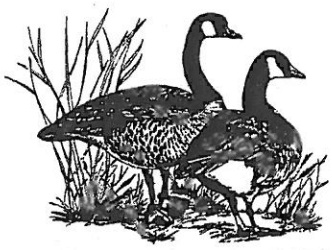
Wetland Birds

Wetlands are home to many species of animals, but birds are probably the most abundant creatures drawn to the area. The diversity is amazing, ranging from ducks and geese to eagles and flycatchers.

Long-legged waders are pigeon-sized to very large wading birds with long necks and long legs. Herons, egrets and bitterns fly with their neck folded over their back; others fly with their neck extended. The American bittern, least bittern, great blue heron, great egret, snowy egret, little blue heron, green heron, and yellow-crowned night heron are just some of the species found in Ohio's wetlands.

Ducks are stocky or slender waterfowl that are smaller than geese and swans, with flattened bills. *Dabbling ducks* feed at the surface, often tipping up; diving ducks are the bay and sea ducks that dive from the surface. Most fly in formations, on rapid wingbeats; some fly with neck extended or have erratic flight.

Geese and Swans are long-necked waterfowl with stout bills. They swim and feed at the water's surface, often tipping up, and usually walk on land. They fly in formation with slow wingbeats and necks extended. The Canada goose, snow goose, trumpeter swan, wood duck, American black duck, mallard, blue-winged teal, Northern shoveler, common goldeneye, and hooded merganser are a few of the species of waterfowl found in Ohio's wetlands.



Raptors are hook-billed predatory birds. Most raptors have long, broad, rounded wings, but wings are narrow and pointed in falcons; the tail is usually fan-shaped or long and rounded. Raptors often soar or flap and coast, and sit with vertical posture. The bald eagle, northern harrier, osprey, red-shouldered hawk, and red-tailed hawk are some of the raptors found in Ohio's wetlands.

Rails are brown-streaked marsh birds with a small head. The bill is long and slim, or chicken-like. Their wings are short, broad and rounded and the tail is very short. They probe in mud, flush from grass and fly with rapid wingbeats. Yellow rail, king rail, Virginia rail, sora, common moorhen, and American coot are the rails that are found in Ohio's wetlands.

Owls are stocky; mainly nocturnal birds of prey with vertical posture; they have large rounded heads, some with ear tufts. Most have camouflage colors. A few hunt during the day. The Eastern screech owl, barred owl, long-eared owl, and short-eared owl, and great-horned owl are found in Ohio.

Kingfishers are large-headed birds with bushy crests and stout, spear-shaped bills. They perch or hover over water, then dive to capture fish. The belted kingfisher is the only kingfisher found in Ohio.

Flycatchers are mostly dully colored, very small to robin-sized birds. Most perch upright and dart out after passing insects; many flick their tail or hold their tail pointed downward. Acadian flycatcher, willow flycatcher, eastern kingbird, and warbling vireo are examples of flycatchers found in Ohio.

Other wetland birds include, but are not limited to, the marsh wren, yellow-throated warbler, prothonotary warbler, swamp sparrow, and red-winged blackbird.

Reptiles:

- Snapping turtle
- Stinkpot (Musk) turtle
- Wood turtle
- Spotted turtle
- Painted turtle
- False map turtle
- Blanding's turtle
- Spiny soft-shell turtle
- Northern water snake
- Smooth green snake
- Brown snake
- Red-bellied snake
- Eastern ribbon snake
- Common garter snake
- Copperhead snake
- Timber rattlesnake
- Eastern massasauga rattlesnake
- Eastern Plains garter snake

Amphibians:

- Marbled salamander
- Spotted salamander
- Two-lined salamander
- Four-lined salamander
- Eastern newt
- Northern cricket frog
- Chorus frog
- Spring peeper
- Bull frog
- Pickerel frog
- Green frog
- Northern leopard frog

Others:

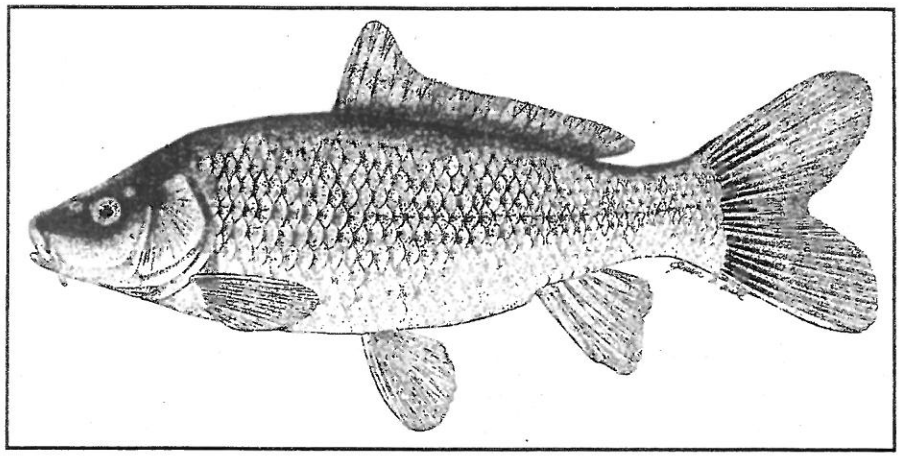
- Caddisfly
- Damselfly
- Leech
- Dragonfly
- Snails
- Crayfish
- Mosquitoes
- Mayflies
- Waterstrider
- Backswimmer
- Whirligig beetle

Ohio Department of Natural Resoures
Division of Wildlife

Life History Notes

Common Carp

Common Names: German, Mirror, or Leather carp
Scientific Name: *Cyprinus carpio*



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Identification

The common carp can be easily identified by several features. First, there are two barbels on each side of the mouth. No other species that closely resembles the carp has these barbels. Second, the first dorsal and anal fin spines are serrated. Most carp are bronze-gold to golden yellow on the sides and yellowish white on the belly. Partly scaled or scaleless individuals are frequently caught by fishermen: these are known as "half-scaled," "mirror" or "leather" carp.

Range and Habitat

The common carp is native to Europe, but were first stocked into Ohio waters in 1879 as a food fish. This species thrives in a wide variety of conditions and has spread to every county in the state. Carp prefer warm lakes, streams, ponds and sloughs with a lot of organic matter. They do not multiply readily in clear, cold water.

Life History

Common carp begin spawning in late April and continue into June. Large females lay between 100,000 and 500,000 eggs in vegetation with water depths between 1 and 4 feet. Young carp remain in these vegetated areas until they are 3 to 4 inches in length and eat primarily small crustaceans. Adults are omnivorous and eat insect larvae, crustaceans, mollusks, and fish. Carp usually live between 9 and 15 years.

Adult Size

Most carp caught by anglers range from 1 to 10 pounds, but they can weigh up to 60 pounds. The state record carp taken by hook and line weighed 50 pounds and measured 40 inches in length. The state bowfishing record is 39 pounds and measured 40 inches in length.

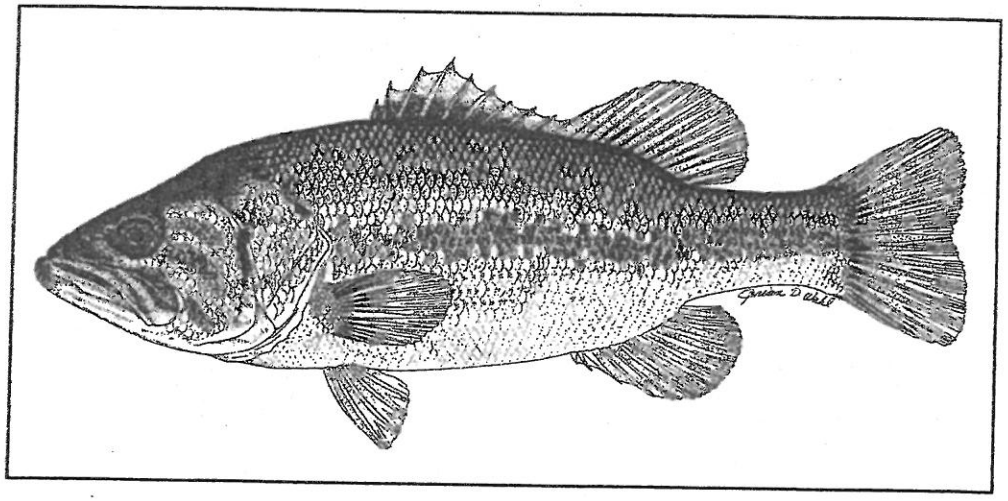
Fishing Methods

Carp can be caught with many different angling methods. Conventional equipment such as cane pole, throw line, or bait casting rods baited with dough balls, worms, crayfish tails, and similar baits are all effective. In addition, many anglers like to use bow and arrow to catch carp. Carp may also be taken with clubs, spears, and by snagging in overpopulated areas.

Ohio Department of Natural Resources
DIVISION OF WILDLIFE
Life History Notes

Largemouth Bass

Common Names: Black bass
Scientific Name: *Micropterus salmoides salmoides*



Publication 6
(R999)

Identification

Largemouth bass are moderately compressed with a deep body. The back of the mouth, when closed, extends past the eye. This characteristic distinguishes it from the smallmouth bass where the back of the mouth does not extend past the eye. The largemouth also has a black band that extends down the side of the body. Spotted bass have a black spot on the gill cover and dark streaks on the lower side of the body.

Range and Habitat

Largemouth bass are native to Ohio and can be found in every county in the state. They prefer ponds, lakes and slow, sluggish streams.

Life History

Largemouth bass usually spawn between mid-April and mid-June. Nests are constructed by the male in 1 to 6 feet of water. The female lays between 2,000 and 20,000 eggs in several different nests; one nest can contain eggs from several females. The male guards the eggs until they have hatched. Young largemouth feed on microscopic animals until they reach 1 inch in length. At this time, they begin eating freshwater shrimp, midge larvae, and other small animals. Adults eat crayfish, frogs, large insects, and other fish.

Adult Size

The average size largemouth bass runs from 1 to 2 pounds. The state record weighed 13 pounds 2 ounces and measured just over 25 inches long.

Fishing Methods

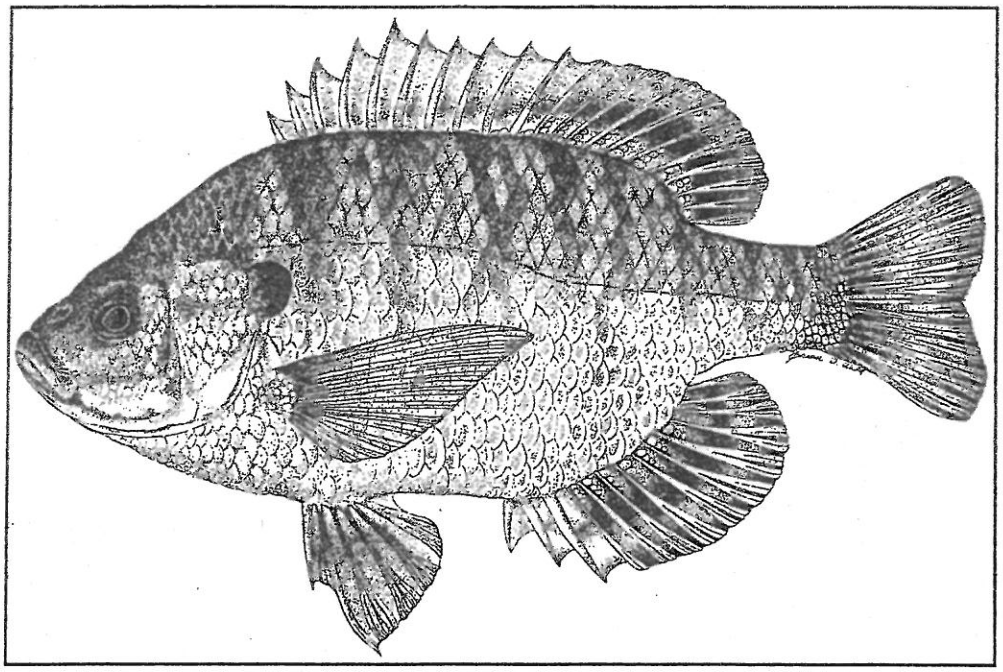
Largemouth bass can be caught on a wide variety of natural and artificial baits using casting, spinning, and fly fishing gear. The best time of year to catch largemouth bass is May, June, and July, but they can be caught throughout the year.

Ohio Department of Natural Resoures
Division of Wildlife

Life History Notes

Bluegill Sunfish

Common Names: Bream
Scientific Name: *Lepomis macrochirus*



Publication 69
(R999)

Identification

A deep slab-sided fish with a small mouth and a long pectoral fin. Colors vary, but the ear flap is always black and bluegills often have a black blotch near the back of the soft dorsal fin.

Range and Habitat

Bluegill occur throughout the state in nearly every stream and water body. Their preferred habitat is clear, warm lakes with some rooted vegetation.

Life History

Bluegill are nest spawners and typically build nests in large groups, or beds, sometime between May and August. Peak spawning, in Ohio, usually occurs in June. Males select an area in 1 to 4 feet of water and sweep out a saucer shaped nest with their tails. The females then lay between 10,000 to 60,000 eggs in the nest which are guarded by the male. The eggs usually hatch in about five days. Young bluegill eat primarily zooplankton or microscopic animals. Adults will also eat zooplankton, but they feed mainly on aquatic insects.

Adult Size

In well managed waters with good habitat, bluegill frequently reach 7 to 10 inches. However, bluegill vary in size from one water body to the next and can become overcrowded. When they are overcrowded most will remain less than 5 inches in length. The state record bluegill weighs 3 lbs., 4.5 oz., and was 12.75 inches long.

Fishing Methods

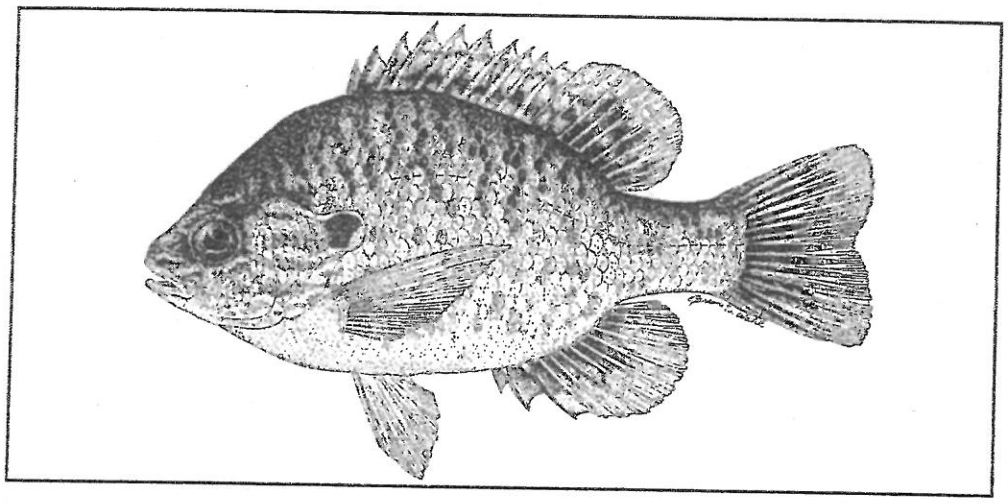
Bluegill bite readily on any number of baits and lures. Probably the most common bait is a worm on a small hook fished under a bobber. However, bluegill will hit almost any natural bait or small spinner baits. Fly fishing is also a popular way to fish for bluegill. Anglers should concentrate on areas near aquatic vegetation or docks. Bluegill 9 inches or longer qualify for a Fish Ohio certificate.

Ohio Department of Natural Resoures
Division of Wildlife

Life History Notes

Pumpkinseed Sunfish

Common Names: Punkys, Yellow sunfish
Scientific Name: *Lepomis gibbosus*



Publication 102
(R999)

Identification:

Pumpkinseed are a very colorful, deep-bodied, slab-sided fish with a small mouth. Breast and belly are orange to yellow, with lighter colored sides in a variety of bright colors. The ear flap is black, but has an orange-red spot on the border.

Range and Habitat:

Pumpkinseed are native to Ohio and are widespread in the Lake Erie drainage. They are also found in isolated areas of the Ohio River drainage. This species prefers clear, non-flowing water and substrates of organic debris and dense submerged aquatic vegetation.

Life History:

Pumpkinseed sunfish are nest spawners with the male digging the nest in water as shallow as 6 to 12 inches. Spawning occurs in May or June and the males guard the nest until the eggs hatch. The female will lay between 1,600 to 2,900 eggs. Several females may lay eggs in a single nest. Adult pumpkinseed eat primarily larval insects, some adult insects, and occasionally larval fish. Pumpkinseed growth is similar to that of bluegills.

Adult Size:

Pumpkinseed larger than 5 to 7 inches are uncommon; although 8- to 10-inch fish are occasionally caught at Lake La Su An Wildlife Area.

Fishing Methods:

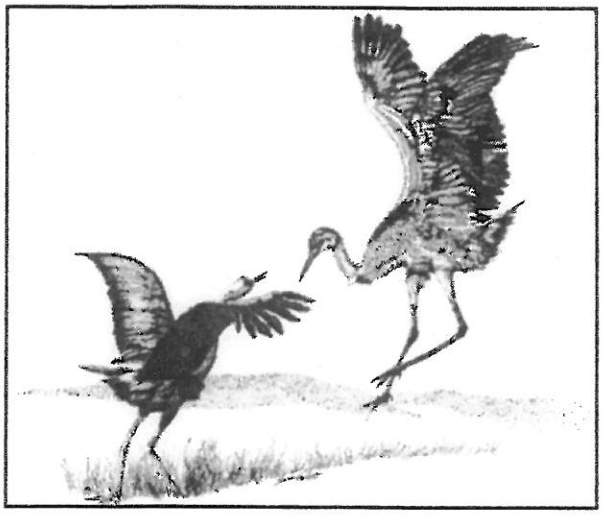
Fishing for pumpkinseed sunfish is similar to fishing for bluegill sunfish. The best method is to use natural baits, such as worms, with small hooks and light lines. In addition, small spinner baits and flies can also be used. Anglers should concentrate along the edges of dense vegetation or woody debris.

Ohio Division of Wildlife

Life History Notes

Sandhill Crane

Scientific Name: *Grus canadensis*



State Endangered Species

Publication 382
(R106)

Introduction

The sandhill crane is among the oldest living species of birds, dating back 2.5 million years. Today, it is an endangered species in Ohio.

A native species, the population in Ohio has decreased due to loss of habitat, primarily wetlands. Their former breeding range in the state extended into northwestern Ohio, an area which held a small breeding population that disappeared in the 1880s. The last nesting pair prior to the 1980's was recorded in 1926 in Huron County. In 1985, a pair appeared in Wayne County, but did not start reproducing until 1987. Since that time, nesting pairs have increased along the Killbuck Valley (Holmes and Wayne counties). Breeding pairs have also been reported in Ashland, Ashtabula, Geauga, Wyandot, and Williams counties. Numbers of cranes breeding in Ohio will probably continue to increase as the young from previous years reach breeding age.

Perhaps the most unique characteristic of the sandhill crane is its tendency to dance. Although an integral part of their courtship, they can be seen dancing any time of the year. The dance of the sandhill crane includes many quick steps around each other, wings half spread with an occasional leap into the air up to eight feet off the ground. Part of this ceremony includes bowing towards one another. Outside of its occurrence during courtship in the spring, researchers are unclear as to why this behavior continues throughout the year.

Description

Sandhill cranes are wading birds characterized by long legs, necks, and bills. The sandhill crane ranges between 34 and 38 inches in height and has a six to seven foot wingspan. Their weight varies from 7.7 to 14.4 pounds according to the sex of the individual bird and the race to which they belong. Outward appearance of the sexes is alike except in size. The male is slightly larger than the female.

The plumage of the adult sandhill crane is gray with a bald red skin patch on its forehead. Their eyes are yellow and their bill, legs, and feet are blackish. Immature sandhill cranes have a gray body with a brownish head and they lack the red skin patch.

There are six races of the sandhill found in North America. Three of these races—the Mississippi, Cuban, and Florida—are sedentary and are the most threatened populations of sandhill cranes. The Mississippi and Cuban races, numbering 40 to 50 and 200 birds respectively, are threatened with extinction. Populations of the other three races are larger and include the lesser, greater, and Canadian races. The sandhill cranes seen migrating through and breeding in Ohio are of the greater sandhill crane race. These birds winter in Florida and fly north in late February or early March. The majority of this race nests in the Great Lakes region of Minnesota, Wisconsin, and Michigan and their numbers appear to be increasing.

Some of the more populated races are hunted in the central and western United States and Canada.

Habitats and Habits

Sandhill cranes are primarily a wetland dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. A single pair's breeding territory can cover up to 200 acres. They will build their nests in undisturbed wetlands in up to three feet of water. The four to five-foot wide nest consists of marsh plants, tubers, or roots pulled up by the birds using their bills.

Their diet is varied and the birds will walk several miles while searching for food. Sandhill cranes will eat roots, tubers, seeds, berries, grain, mice, small birds, snakes, lizards, frogs, and crayfish in wet meadows or bogs. In a dry pasture, they may feed on grasshoppers, earthworms, and crickets.

The sandhill crane is a diurnal (active in the daylight hours) species and will roost at night in relatively large groups. During daylight hours, they break up into smaller groups, usually pairs or family groups.

In flight, the sandhill crane migrates at high elevations in large flocks, often composed of thousands of birds. The flight formation is usually a "V", but sometimes it's a straight line. The birds spend little time gliding and are noted for a quick upward wingbeat and a longer downward wingbeat. Sandhill cranes fly with their necks fully extended and can be distinguished from herons which fly with their necks bent in something of an "S" shape. Their flight speed has been recorded at 25 to 35 mph.

Reproduction and Care of Young

The sandhill crane is monogamous and will generally only change mates due to the death of one of the pair. Nest construction usually begins in April and eggs are laid in May among the greater sandhill crane race in the Great Lakes region. Clutch size varies from one to three eggs; there are usually two. The eggs are olive with lavender or brown spots and they are incubated for 28 to 30 days by both the male and female. Each pair will raise a single brood in a year; however, they can renest if the eggs are damaged or destroyed by predators.

After hatching, the older chick is more aggressive than the younger, and the two must be separated by the parents. The parents will split up and walk in separate directions so that one chick will follow one parent and the other chick the other parent. The precocial young will leave the nest in less than 24 hours.

The juveniles will fly 90 days after hatching. After fledging, the young remain with their parents throughout the year. The parents will abandon their young cranes just prior to the next nesting season. These sexually immature birds will find a mate as early as three years of age, but will not actively reproduce until age five. Little is known of their life expectancy in the wild. In captivity, the oldest sandhill crane lived to be 24 years old.

Management Plans

The Division is buying and restoring wetlands on state property and working with landowners to protect and restore wetlands on private properties. The nesting pairs on state property are left undisturbed to enhance nesting success rates.

Viewing Opportunities

Killbuck and Funk Bottoms wildlife areas provide the best viewing opportunities for sandhill cranes. Occasionally, sandhills are seen flying over Magee Marsh Wildlife Area and Ottawa National Wildlife Refuge during the spring and fall migration periods.

Do Something Wild!

The sandhill crane is an endangered species within the state of Ohio. Money to acquire and restore wetlands, which is a critical habitat for the sandhill crane, has come through the Do Something Wild! state income tax checkoff program. Through the generosity of Ohio citizens, who either donated through the checkoff or their direct contribution to the Endangered Species Special Account, the Division is able to obtain habitat that will benefit cranes, and educate and inform Ohioans about our endangered species.

Tax time **is not** the only time you can help. Contributions to our Endangered Species and Wildlife Diversity program are accepted throughout the year. To make a donation, please send a check to: Endangered Species Special Account, Ohio Division of Wildlife, 1840 Belcher Drive, Columbus, Ohio 43224-1329. All contributions, whether made on your tax return or directly, are tax deductible.

At a Glance

Mating: Monogamous

Peak Breeding Activity: April-May

Incubation Period: 28-30 days

Young are Hatched: June

Clutch Size: 2 eggs

Young: Precocial, fledge (gain flight) in 90 days

Number of Broods per Year: 1

Adult Weight: 7-14 pounds

Adult Height: 34-38 inches

Adult Wingspan: 6-7 feet

Life Expectancy: Unknown in the wild; 24 years in captivity

Migration Patterns: Seasonal resident; unknown how far young go to establish their own territory.

Feeding Periods: Daylight hours

Typical Foods: Grain, insects, birds, mammals (small), amphibians, and reptiles.

Native to Ohio: Yes

Active or Potential Nuisance Species: No

This species is endangered in the state of Ohio.

Additional Reading

Migratory Shore and Upland Game Bird Management in North America edited by T. C. Tacha and C. E. Braun.

The Ohio Breeding Bird Atlas by Bruce G. Peterjohn and D. L. Rice.

The Audubon Society Encyclopedia of North American Birds by J. K. Terres

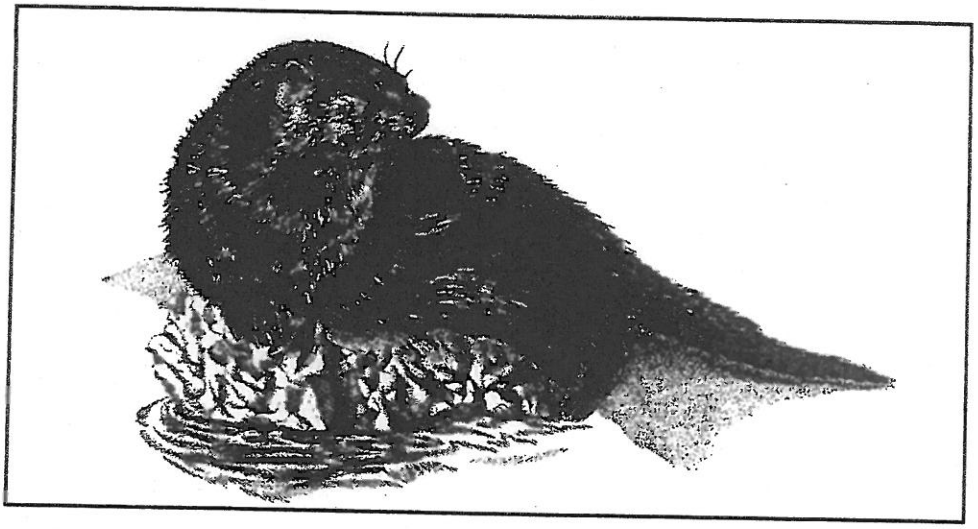
Birds of the World by O. L. Austin, Jr.

ODNR Division of Wildlife

Life History Notes

River Otter

Scientific Name: *Lontra canadensis*



Publication 384
(R803)

Introduction

River otters were historically distributed throughout much of North America, excluding the frozen Arctic and the Southwest. Otters are native to Ohio, but were extirpated by the early 1900s. In 1986, the ODNR Division of Wildlife began a seven-year project to reintroduce the species to the state. Over this period, 123 otters were captured in Arkansas and Louisiana using modern foothold traps and were released in the Grand River, Killbuck Creek, Little Muskingum River, and Stillwater Creek. Since then, river otters have been sighted in nearly two-thirds of Ohio's counties and young otters or family groups have been seen throughout eastern Ohio.

Description

Otters are highly adapted for swimming, possessing a long, tapered body with sleek, short, dense fur. Its small head widens to the neck and shoulders. There are long, stiff and highly sensitive facial whiskers behind and below the nose that aid the otter in finding and capturing prey. Their teeth are like those of other carnivores– adapted for grasping, grinding, shearing, and crushing. Their large feet are completely webbed. The tail is flattened and is well muscled; the tail is important in the animal's swimming ability and makes up about 50 percent of its total body length. Maximum length is reached at three to four years of age. Adult weight ranges from 11 to 33 pounds.

Habitat and Habits

Otters live in aquatic habitats--rivers, lakes, and marshes. Otters can live in both marine and freshwater environments. They prefer tributaries of major, unpolluted drainages where there is minimal human disturbance. Log jams and submerged trees provide resting and feeding habitat. Often dens are in abandoned beaver lodges. Aquatic habitat must provide an abundant amount of prey, such as slow-moving rough fish. Home ranges are used throughout the year and can be large and linear (5 to 30 square miles). During the breeding and rearing season the range is much reduced for females.

Otters are generally nocturnal (active at night) or crepuscular (active at dawn or dusk), although diurnal (daytime) activity is not uncommon in undisturbed areas. River otters are often seen in family groups in the summer and early fall.

Reproduction and Care of Young

Otters usually reach sexual maturity at two years of age. The river otter's reproductive cycle involves delayed implantation of the fertilized egg, an arrested period of development and embryo growth. This process is not fully understood. Delayed implantation results in a gestation period of 290-380 days.

Breeding occurs in early spring following the birth of a litter. Newborn pups are silky black, blind, toothless, and helpless. The pups usually weigh four to six ounces and are 8 to 11 inches long at birth. They grow rapidly and emerge from the den at two months of age. Young eat

solid food at this age as well; however, they are not weaned until they are three months old. Litters are cared for by the female otter.

Young otters are self-sufficient by the time they are five to six months, but the family group remains intact for at least seven or eight months or until just prior to the birth of a new litter. Yearling otters can disperse up to 20 miles or more from where they were reared.

Management Plans

Otter releases are complete now that the Division of Wildlife has met the Strategic Plan goal of establishing reproducing populations in suitable habitats. The Division continues to conduct extensive research and monitoring programs to ensure otters remain a healthy part of Ohio's heritage, and current management programs are based on the best biological information available. Otter populations are monitored using many different methods, including a helicopter snow-track survey, a bridge-crossing survey, and public observation reports.

Viewing Opportunities

The chance to observe river otters increasing every year as the population continues to grow. Although gregarious in behavior among others of their species, otters generally avoid contact with humans; thus, most sightings are accidental. The best opportunities to see otters, their tracks or other sign in Ohio are at the Grand River, Mosquito Creek, Pymatuning Creek, Chagrin River, Killbuck Creek, Stillwater River, Little Muskingum River, and their tributaries.

At a Glance

Mating: Monogamous

Peak Breeding Activity: March - April

Gestation Period: 290-380 days, including delayed implantation

Young are Born: February-April and are dependent on their mother. They generally leave the family group at 8-12 months of age.

Litter Size: 2-4 pups

Number of Litters per Year: 1

Adult Length: 38-58 inches, head to tail

Adult Height: 7-10 inches

Life Expectancy in the Wild: 10-15 years

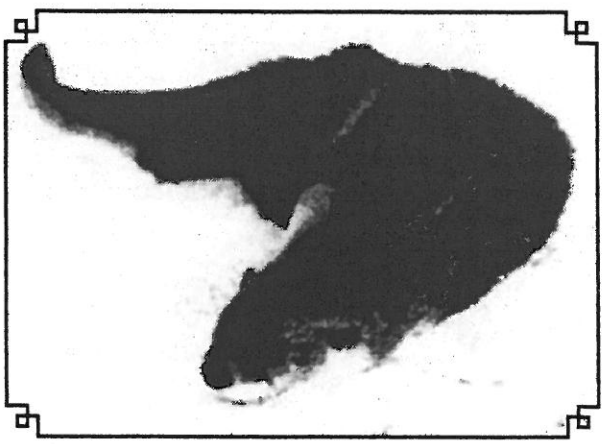
Migration Patterns: Year round resident; young go 10-20 miles to establish their own territories.

Feeding Periods: At night (nocturnal) or twilight (crepuscular)

Typical Foods: Fish, aquatic insects, crayfish, snakes, frogs, and to a lesser extent waterfowl and mammals.

Native to Ohio: Yes

The river otter was removed from the state endangered species list in 2002.



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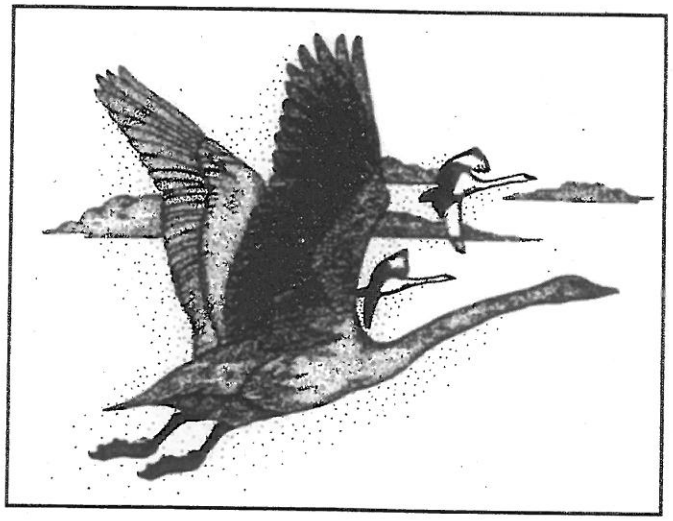
Ohio Division of Wildlife

Life History Notes

Trumpeter Swan

Scientific Name: *Cygnus buccinator*



State Endangered Species

Publication 381
(399)

Introduction

Great numbers of trumpeter swans once inhabited lakes and marshes throughout much of Canada and the northern United States. In the Ohio Territory, accounts by French missionaries describe trumpeters nesting in the marshes along the Detroit River and at the entrance to Lake Erie. Trumpeters most likely nested in the adjacent southwestern Lake Erie marsh region as well, but were not documented because it was so difficult for humans to penetrate this area, then covered by the Great Black Swamp. Archeological evidence shows trumpeter swans once inhabited several regions of Ohio.

Trumpeter swans were killed for food and skins, first by Indians and then by white men upon arrival on the continent. Swan skins were sold and used to make powder puffs in the flourishing wildlife trade in Europe. Feathers were used to adorn fashionable clothing and to make writing pens. The plumage trade peaked in the early 1800s and swan populations were dramatically reduced by the mid-1800s. Loss of habitat for this wetland-dependent species resulted in further declines. By 1900, trumpeter swans were extirpated from nearly all their breeding range, except for a few remote areas of Alaska and the western United States.

Passage of the Migratory Bird Treaty Act by Congress in 1918 provided protection for swans in the U.S. Despite this measure, by 1932 only 69 trumpeter swans were known to exist in the lower 48 states. This remnant population got its first boost in 1935 when the U.S. government established the Red Rock Lakes National Wildlife Refuge in Montana. This refuge protected the population that existed in the remote mountain valleys where the states of Montana, Idaho, and Wyoming meet.

Trumpeter swan restoration and management programs that began in the mid-1900s in the U.S. and Canada gradually boosted trumpeter swan populations. In 1996, Ohio became one of a number of states involved in reintroduction plans to restore trumpeter swans to the Midwest.

Description

The trumpeter swan is one of eight swan species, the largest swan in the world and the largest species of waterfowl native to North America. It is one of only two swan species that are native to North America. The other is the Tundra swan. The mute swan is also found throughout North America, but is an introduced species that came from Europe.

Trumpeter swans measure up to four feet in height with a wingspan of seven to eight feet. They weigh 20 to 30 pounds; the male averages 27 pounds and the female 22 pounds.

The adult trumpeter has snow white plumage with a black bill and feet; a young bird or cygnet is a sooty gray color with pinkish colored bill and feet. The neck and head feathers of an adult may be stained a rusty color from feeding in water that contains iron. The bill of a trumpeter swan may also have a red border on the lower jaw that gives the bird the appearance of wearing lipstick.

The long neck of the trumpeter swan is an adaptation that allows the bird to access food inaccessible to other species of waterfowl. The trumpeter can uproot plants in four feet of water.

The trumpeter derives its name from its call, described as resonant, deep, loud, and trumpet-like, resembling the notes of a French horn. The trumpeter swan has a life span of 20 to 30 years.

Historically, trumpeter swans had a breeding range that ran from the southern half of Alaska, south and east through Canada and into the northern half of the continental U. S. including Washington and Oregon, the Plains and Midwest states, south through the northeast half of Arkansas and the western portions of Mississippi, Tennessee and Kentucky, and finally east through Ohio, northern West Virginia, Pennsylvania, and New York to New England and the Atlantic Coast. Swans then wintered in the southern half of the continental United States.

The breeding and wintering ranges for the interior population of trumpeter swans, including those being reintroduced into Ohio, are smaller pockets and still being defined. Refer to the map for details of the breeding and wintering range of interior trumpeters.

Habitat and Habits

Trumpeter swans prefer large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. The bulk of their diet consists of arrowhead, sago pondweed, wild celery tubers and the stems and leaves of waterweed, pondweeds, water milfoil, white water buttercup, muskgrass, burreed, and duckreed. They feed occasionally on freshwater invertebrates, snails, worms, seeds, and grain. Adult swans primarily feed in shallow water using their long necks to reach their food, but can also tip-up like dabbling ducks to feed in water four feet deep.

Reproduction and Care of the Young

Trumpeter swans are monogamous, forming pair bonds at their wintering grounds. Pairs typically begin nesting at four to six years of age and often select a nesting area near where the female, called a *pen*, hatched or fledged.

Trumpeter swans are usually the first waterfowl to appear on breeding grounds, arriving barely after the ice melts in the spring. They begin courtship behavior at this point. Courtship behavior includes bobbing their heads and quivering their wings while facing each other.

Nest building usually begins in April and may take up to two weeks to complete. The nest may be as large as six feet or more in diameter. Swans often build a nest on top of muskrat lodges or in stands of emergent vegetation, such as bulrushes, cattails or sedges where the water is one to three feet deep. They frequently use the same nest structure from year to year.

The pen usually begins laying eggs in late April. She will lay one off-white egg every other day until the clutch of four to six eggs is complete. The average clutch is five eggs. The eggs are about 4.5 inches long and three inches wide. The incubation period lasts 33 to 37 days. If she leaves the nest to feed, bathe or preen, the female will cover the eggs with nest material. The male or *cob,* does not share incubation duties with the pen, but will guard the nest vigorously, chasing away any intruders. Trumpeter swans are very territorial birds and will boldly defend mating, nesting, and cygnet feeding areas from other large birds including other swans, Canada geese, and herons.

Cygnets hatch in June and weigh about seven ounces. They take to the water after only a day or two and feed in shallow water areas on aquatic insects, crustaceans, and vegetation.

Cygnets remain with their parents through the summer and migrate with them to wintering grounds in October or November. They migrate with their parents back to summer grounds in the spring, but are then chased away by the adults. They remain in sibling groups until they are about two years old and then they begin to seek their own mates.

Management Plans

In May 1996, the Ohio Division of Wildlife released trumpeter swans on the Magee Marsh Wildlife Area in Ottawa County. It was the first release at one of nine sites selected for this 10-year project. About 150 trumpeter swans are scheduled to be released during this reintroduction effort.

The Division of Wildlife, Cleveland Metroparks Zoo, the Wilds, and Ducks Unlimited joined in the reintroduction program to restore this swan to the state. These magnificent waterfowl will add to the diversity of wildlife in Ohio and enhance wildlife viewing opportunities on state wetlands.

Young swans are being acquired from zoos and aviculturists and cared for at the Wilds, a wildlife preservation center in Muskingum County. The swans will be released on selected sites when they reach about 2.5 years of age. In addition to acquiring young swans, the Division collects eggs from trumpeter swan nests in Alaska each spring. The eggs are hatched at Cleveland Metroparks Zoo where the young are cared for until about three

months of age. These Ohio-hatched cygnets then join the other young swans reared at the Wilds until they are ready for release, in groups of 10 to 15.

Only high quality wetlands are chosen as release sites, taking into account the area's wildlife viewing potential and quality wetland acreage. Many of the wetlands at the release sites were created as a result of restoration work the Division has completed through the North American Waterfowl Management Plan (NAWMP). The NAWMP includes a series of initiatives to restore, protect, and enhance wetland habitat and these areas are providing prime habitat and diverse vegetative content that make them excellent release sites for trumpeter swan reintroduction. Wetland restoration has been undertaken by the Division in cooperation with many conservation organizations and private partners.

Viewing Opportunities

Currently, trumpeter swans can be seen at four locations: the Magee Marsh Wildlife Area in Ottawa County, Killbuck Marsh Wildlife Area in Wayne and Holmes county, Funk Bottoms Wildlife Area in Wayne and Ashland counties and the Cleveland Metroparks Zoo. At Magee Marsh, the initial release of 15 trumpeter swans was made in 1996. These waterfowl can often be seen along the road that runs through the wildlife area. Look for nesting trumpeters on muskrat houses.

At the Cleveland Metroparks Zoo, trumpeter swan eggs are hatched from the eggs collected from active Alaskan nests. Once the eggs hatch in June, the young are on display at the zoo throughout the summer, then released to holding pens at the Wilds. Two adult trumpeter swans are also on display at the zoo's avian building.

In the next 10 years, viewing opportunities will expand greatly with the release of swans at eight other wildlife areas: Mallard Club in Lucas County, Pickerel Creek in Sandusky County, Mosquito Creek in Trumbull County, Big Island in Marion County, Killbuck Marsh in Wayne County, Woodbury in Coshocton County, Egypt Valley in Belmont County, and Spring Valley in Greene County.

Note: *Trumpeter swans are very territorial during nesting and rearing periods, often remaining that way until the young are a half year old. They can easily knock down a human being with their large, strong wings or break the skin with their bite. Observers should keep a good distance when viewing these swans and* ***should not*** *approach a nest, adult swans, or cygnets.*

Contact your nearest wildlife district office for information on future release locations and dates.

Do Something Wild!

The trumpeter swan is among the majority of wildlife species in Ohio that are not hunted. All of these animals are vital parts of our overall ecosystem and contribute to the wildlife diversity in the state. Helping us manage and research these species are the generous citizens of the state of Ohio. With money they either donated through the state income tax checkoff, by the purchase of a wildlife license plate, or their direct contribution to the Endangered Species Special Account, the Division is able to purchase critical habitat essential to sustaining many species of wildlife and to implement programs such as the reintroduction of the trumpeter swan to Ohio.

Contributions to our Wildlife Diversity Program are accepted throughout the year. To make a donation, please send a check to: Endangered Species Special Account, Ohio Division of Wildlife, 1840 Belcher Drive, Columbus, Ohio 43224-1329. All contributions, whether made on your income tax return or directly, are tax deductible.

At a Glance

Mating: Monogamous

Peak Breeding Activity: April

Incubation: 33-37 days

Young Hatch: June

Clutch Size: 5-9 eggs; 5 is average.

Young Leave Parents: At one year.

Number of Broods per Year: 1

Adult Weight: 20-30 pounds

Adult Wingspan: 7 foot

Adult Height: 4 feet

Life Expectancy: 20-30 years

Migration Pattern: Year- round resident

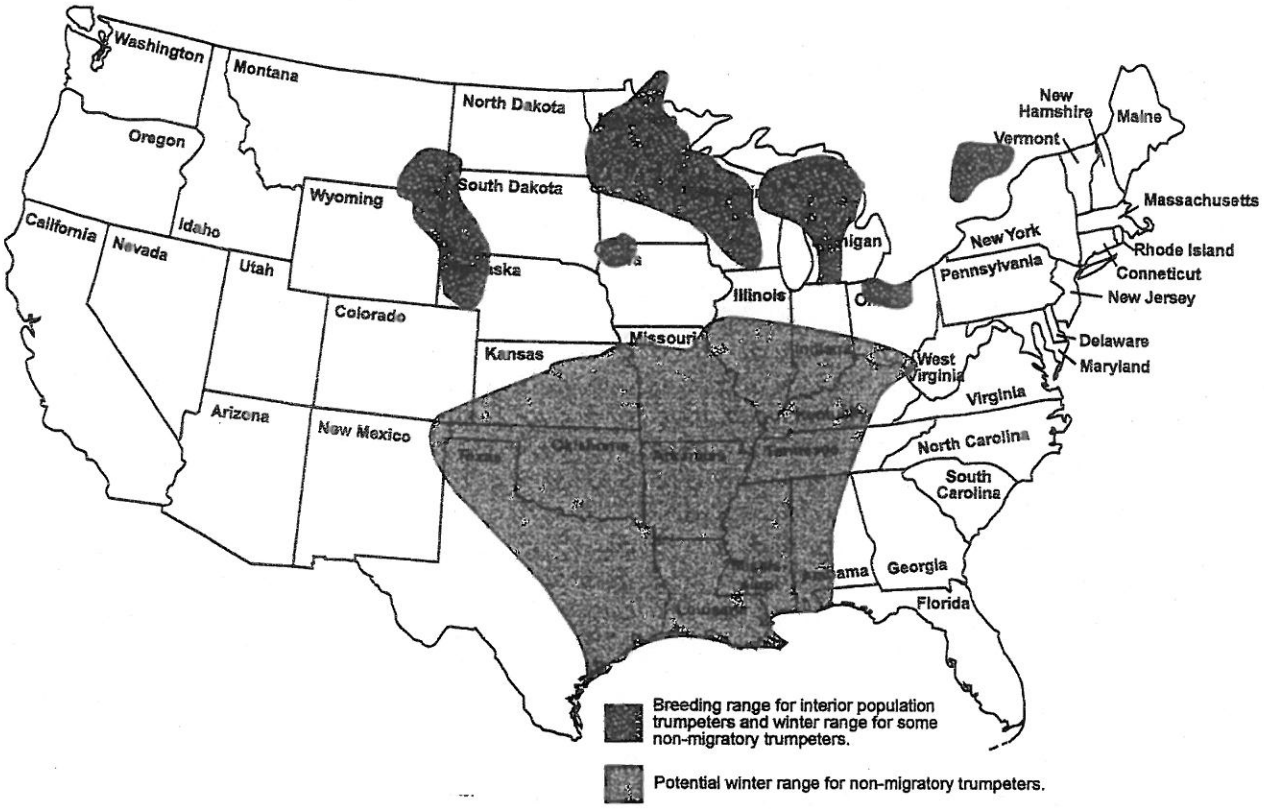
Typical Foods: Tubers and leaves of submergent and emergent aquatic vegetation

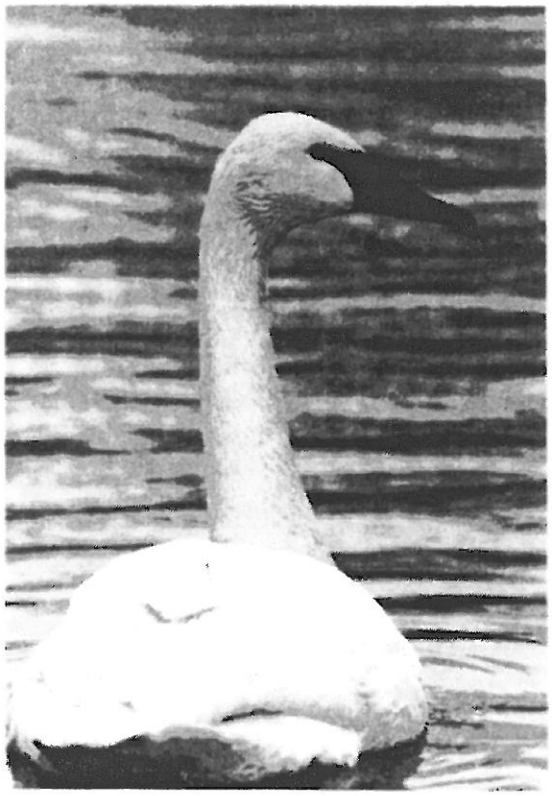
Native to Ohio: Yes

Active or Potential Nuisance Species: No

The trumpeter swan is a state endangered species. It is not listed as federally endangered or threatened, but is protected from hunting.

Breeding and Winter Range for Trumpeters





Bob Taft, Governor / Samuel W. Speck, Director / Michael J. Budzik, Chief
An Equal Opportunity Employee - M/F/H

Exotic Aquatics: Invasive Plants and Animals

Purple Loosestrife—*Lythrum slicaria*
Purple loosestrife produces a brilliant spike of lavender flowers making it a popular garden plant. However, this species has become a major pest in natural wetlands throughout much of the United States. In Ohio, it is especially abundant in the marshes at the western end of Lake Erie, although it is spreading rapidly throughout most of the state. The species can be easily identified by its tall and bushy growth habit, its flower spikes, and its opposite leaves and square stem.

Glossy Buckthorn—*Rhamnus fragnula*
This shrub has become a serious problem in several important wetland plant communities in Ohio. In bogs, fens, and wet prairies, this invasive species can completely displace native species over large areas. Glossy buckthorn can be identified by its shiny leaves, yellow pith, abundant lenticels, and red to purple berries. Birds distribute the berries widely, which has enabled the species to spread to virtually every bog and fen in northern Ohio.

Narrow-leaved and Hybrid Cattails—*Typha angustifolia and Typha X glauca*
Narrow-leaved cattail (*Typha angustifolia*) crosses with the native broad-leaved cattail (*Typha latifolia*) to make the hybrid (*Typha X glauca*). Both the narrow-leaved and the hybrid are aggressively-spreading plants which tend to form dense colonies that can crowd out a diversity of native emergent marsh species. Both plants can be distinguished from broad-leaved cattails by a gap of 1-4 inches that separates the male from the female flowers as well as the narrower leaves. Cattails spread aggressively from rhizomes and airborne seeds.

Reed Grass—*Phragmites australis*
Reed grass has become a tremendous problem in Lake Erie coastal marshes and other wetland habitats throughout northern Ohio. The grass forms extensive colonies with individual stalks often reaching 10-15 feet in height. The plant spreads aggressively by sending out runners on or beneath the surface that can extend 50 feet or more. The species is easily recognized by its gigantic size, its large terminal flowering stalk, its hollow stem, as well as its broad (1.5 to 2 inch) leaves.

Reed Canary Grass—*Phalaris arundinacea*
This grass forms dense populations that virtually eliminate all other plants. The species has become a serious problem in several native plant communities including marshes and fens where it can comprise nearly 100 percent of all plant matter. Reed canary grass can be recognized by its long broad leaves, a dense flower with a purplish hue when fresh, and a large ligule at the summit of its sheath.

You can prevent and control the spread of these invasive plant species:

- **Check and clean your watercraft thoroughly before you move from one waterbody to another**
- **Avoid using these aquatic and wetland invasive plants on your property**
- **Volunteer with your local park district or management agency to help remove these species**
- **Spread the word about the threats that these species pose to Ohio's wetlands**

Zebra Mussel—*Dreissena polymorpha*

These small, fingernail-sized mussels are native to the Caspian Sea region of Asia. They were discovered in Lake St. Clair near Detroit in 1988. Tolerant of a wide range of environmental conditions, zebra mussels have now spread to parts of all of the Great Lakes and the Mississippi River and are showing up in inland lakes. Zebra mussels clog water-intake systems of power plants and water treatment facilities, and the cooling systems of boat engines. They have severely reduced, and may eliminate native mussel species. Zebra mussels filter plankton from the water and can filter about one quart of water per day. Their waste accumulates at the bottom of the lake which can benefit bottom feeders, but these mussels reduce the plankton food chain for upper water species. Diving ducks and the freshwater drum eat zebra mussels, but they will not significantly control them.

Ruffe—*Gymnocephalus cernuus*

This small European member of the perch family is native to central and eastern Europe. It was introduced to the Duluth harbor, probably in tanker ballast water, around 1985, and is spreading to other rivers and bays around Lake Superior. It is considered a pest species in Europe as well. The ruffe's ability to displace other species in newly invaded areas is due to: (1) its high reproductive rate, (2) its opportunistic feeding habits, and (3) characteristics such as bottom feeding and sharp spines that make them difficult for large predator fish such as walleye and pike to eat.

Spiny Water Flea—*Bythotrephes cederstroemi*

The spiny water flea, or "B.C" is not an insect at all, but a tiny crustacean with a long, sharp, barbed tail spine. A native of Great Britain and northern Europe, the animal was first found in Lake Huron in 1984—probably imported in the ballast water of a trans-oceanic freighter. Since then, populations have exploded and the animal can be found throughout the Great Lakes and some inland lakes. Their biggest threat to new ecosystems is their competition for food with native small fish such as lake perch. Spiny water fleas reproduce rapidly and the spiny tail makes them difficult for small fish to eat.

Round Goby—*Neogobius melanstomus*

The goby is an aggressive, bottom-dwelling fish. It is usually 3 to 6 inches long, but may be up to 10 inches long. It has thick lips, frog-like eyes, and a fused pelvic fin. Originally the round goby and the tubenose goby were introduced into the St. Claire River in 1990, probably via contaminated ballast water of transoceanic ships. Round goby are thriving in the Great Lakes Basin because they are aggressive, voracious feeders that can forage in total darkness. The round goby takes over spawning sites traditionally used by native species, competing with native fish for habitat and changing the balance of the ecosystem.

You can prevent and control the spread of these invasive animal species:

- **Clean all your fishing tackle, diving gear, nets, boat, motor, trailer, and other equipment thoroughly BEFORE moving from one waterbody to another.**
- **Drain water from boat motors, live wells, bilges, transom wells, bait buckets, and other containers on land BEFORE leaving a water area.**
- **Do not transport water from one area to another OR release live bait, aquarium pets, plants or animals into any lake, river, or stream.**
- **Discard contaminated fishing line and nets that are uncleanable.**

WETLAND LAWS AND LEGISLATIONS

This section includes:

- ***Know Your Legislation: What's in it for Wildlife? A Project WILD Activity***
- ***Wetland Laws and Legislation***
  - Endangered Species Act—www.epa.gov
  - National Environmental Policy Act—www.epa.gov
  - North American Wetlands Conservation Act—www.fws.gov
  - Pollution Prevention Act—www.epa.gov
  - Transportation Equity Act—www.epa.gov/owow/tea/teafact.html
  - Wetland Agreements—www.fws.gov
  - Emergency Wetlands Resources Act of 1986—www.fws.gov
  - Clean Water Act—www.epa.gov

The laws referenced above have or have had significant impact on wetland conservation in Ohio and across the United States. The websites are provided for students and teachers to do research on these laws for their studies.

The following pages contain summaries about some of the laws referenced above. We included these summaries as a starting point for students to complete assignments designed around the Project WILD activity *Know Your Legislation: What's in it for Wildlife?*

We would also encourage your students to research media sources including newspapers and Internet news sources to see how the media and the public affects legislation for wetlands and wildlife.

If you have any further questions, feel free to call your local Division of Wildlife office, Ohio EPA office, or USGA Extension office.

Wetland Laws and Legislations

The following pages include laws and legislation that effect wetlands in the United States. These publications and Web pages are current as of November 2005. For more information, you can check out the appropriate web pages listed on the following pages.

We included these summaries as a starting point for students to complete assignments designed around the Project WILD activity *Know Your Legislation: What's in it for Wildlife?* If you have any further questions, feel free to call you local Division of Wildlife office, Ohio EPA office, or USGA Extension office.

U.S. Fish & Wildlife Service

ESA Basics

40 Years of Conserving Endangered Species

When Congress passed the Endangered Species Act (ESA) in 1973, it recognized that our rich natural heritage is of "esthetic, ecological, educational, recreational, and scientific value to our Nation and its people." It further expressed concern that many of our nation's native plants and animals were in danger of becoming extinct.

The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. The Interior Department's U.S. Fish and Wildlife Service (FWS) and the Commerce Department's National Marine Fisheries Service (NMFS) administer the ESA. The FWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such as whales and anadromous fish such as salmon.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments.

As of January 2013, the FWS has listed 2,054 species worldwide as endangered or threatened, of which 1,436 occur in the United States.

How are Species Listed?

Section 4 of the ESA requires species to be listed as endangered or threatened solely on the basis of their biological status and threats to their existence. When evaluating a species for listing, the FWS considers five factors: 1) damage to, or destruction of, a species' habitat; 2) overutilization of the species for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) inadequacy of existing protection; and 5) other natural or manmade factors that affect the continued existence of the species. When one or more of these factors imperils the survival of a species, the FWS takes action to protect it. The Fish and Wildlife Service is required to base its listing decisions on the best scientific information available.

USFWS

Bart Gamett/USFWS

At home in streams and lakes in Washington, Oregon, Idaho, Montana, and Nevada, the threatened bull trout needs clean, cold water with deep pools, logs for hiding, connected habitat across the landscape and, for spawning and rearing, clean streambed gravel.

Candidates for Listing

The FWS also maintains a list of "candidate" species. These are species for which the FWS has enough information to warrant proposing them for listing but is precluded from doing so by higher listing priorities. While listing actions of higher priority go forward, the FWS works with States, Tribes, private landowners, private partners, and other Federal agencies to carry out conservation actions for these species to prevent further decline and possibly eliminate the need for listing.

Protection

The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products, except under Federal permit. Such permits generally are available for conservation and scientific purposes.

What is "Take"?

The ESA makes it unlawful for a person to take a listed animal without a permit. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Through regulations, the term "harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." Listed plants are not protected from take, although it is illegal to collect or maliciously harm them on Federal land. Protection from commercial trade and the effects of Federal actions do apply for plants. In addtion, States may have their own laws restricting activity involving listed species.

Recovery

The law's ultimate goal is to "recover" species so they no longer need protection under the ESA. Recovery plans describe the steps needed to restore a species to ecological health. FWS biologists write and implement these plans with the assistance of species experts; other Federal, State, and local agencies; Tribes; nongovernmental organizations; academia; and other stakeholders.

Federal Agency Cooperation

Section 7 of the ESA requires Federal agencies to use their legal authorities to promote the conservation purposes of the ESA and to consult with the FWS and NMFS, as appropriate, to ensure that effects of actions they authorize, fund, or

carry out are not likely to jeopardize the continued existence of listed species. During consultation the "action" agency receives a "biological opinion" or concurrence letter addressing the proposed action. In the relatively few cases in which the FWS or NMFS makes a jeopardy determination, the agency offers "reasonable and prudent alternatives" about how the proposed action could be modified to avoid jeopardy. It is extremely rare that a project ends up being withdrawn or terminated because of jeopardy to a listed species.

The ESA also requires the designation of "critical habitat" for listed species when "prudent and determinable." Critical habitat includes geographic areas that contain the physical or biological features that are essential to the conservation of the species and that may need special management or protection. Critical habitat designations affect only Federal agency actions or federally funded or permitted activities. Federal agencies are required to avoid "destruction" or "adverse modification" of designated critical habitat.

Critical habitat may include areas that are not occupied by the species at the time of listing but are essential to its conservation. An area can be excluded from critical habitat designation if an economic analysis determines that the benefits of excluding it outweigh the benefits of including it, unless failure to designate the area as critical habitat may lead to extinction of the listed species.

The ESA provides a process for exempting development projects from the restrictions if a Cabinet-level "Endangered Species Committee" decides the benefits of the project clearly outweigh the benefits of conserving a species. Since its creation in 1978, the Committee has only been convened three times to make this decision.

Working with States

Partnerships with States are critical to our efforts to conserve listed species. Section 6 of the ESA encourages States to develop and maintain conservation programs for threatened and endangered species. Federal funding is available to promote State participation. Some State laws and regulations are more restrictive than the ESA in granting exceptions or permits.

Working with Landowners

Two-thirds of federally listed species have at least some habitat on private land, and some species have most of their remaining habitat on private land. The FWS has developed an array of tools and incentives to protect the interests of private landowners while encouraging management activities that benefit listed and other at-risk species.

Habitat Conservation Plans

Section 10 of the ESA may be used by landowners including private citizens, corporations, Tribes, States, and counties who want to develop property inhabited by listed species. Landowners may receive a permit to take such species incidental to otherwise legal activities, provided they have developed an approved habitat conservation plan (HCP). HCPs include an assessment of the likely impacts on the species from the proposed action, the steps that the permit holder will take to avoid, minimize, and mitigate the impacts, and the funding available to carry out the steps.

HCPs may benefit not only landowners but also species by securing and managing important habitat and by addressing economic development with a focus on species conservation.

Safe Harbor Agreements

Safe Harbor Agreements (SHAs) provide regulatory assurance for non-Federal landowners who voluntarily aid in the recovery of listed species by improving or maintaining wildlife habitat. Under SHAs, landowners manage the enrolled property and may return it to originally agreed-upon "baseline" conditions for the species and its habitat at the end of the agreement, even if this means incidentally taking the species.

Candidate Conservation Agreements

It is easier to conserve species before they need to be listed as endangered or threatened than to try to recover them when they are in danger of extinction or likely to become so. Candidate Conservation agreements (CCAs) are voluntary agreements between landowners—including Federal land management Agencies— and one or more other parties to reduce or remove threats to candidate or other at-risk species. Parties to the CCA work with the FWS to design conservation measures and monitor the effectiveness of plan implementation.

Candidate Conservation Agreements with Assurances

Under Candidate Conservation Agreements with Assurances (CCAA), non-Federal landowners volunteer to work with the FWS on plans to conserve candidate and other at-risk species so that protection of the ESA is not needed. In return, landowners receive regulatory assurances that, if a species covered by the CCAA is listed, they will not be required to do anything beyond what is specified in the agreement, and they will receive an enhancement of survival permit, allowing incidental take in reference to the management activities identified in the agreement.

Conservation Banks

Conservation banks are lands that are permanently protected and managed as mitigation for the loss elsewhere of listed and other at-risk species and their habitat. Conservation banking is a free-market enterprise based on supply and demand of mitigation credits. Credits are supplied by landowners who enter into a Conservation Bank Agreement with the FWS agreeing to protect and manage their lands for one or more species. Others who need to mitigate for adverse impacts to those same species may purchase conservation bank credits to meet their mitigation requirements. Conservation banking benefits species by reducing the piecemeal approach to mitigation that often results in many small, isolated and unsustainable preserves that lose their habitat functions and values over time.

International Species

The ESA also implements U.S. participation in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), a 175-nation agreement designed to prevent species from becoming endangered or extinct due to international trade. Except as allowed by permit, CITES prohibits importing or exporting species listed on its three appendices. A species may require a permit under the ESA, CITES, or both.

For More Information

For more information, contact the U.S. Fish and Wildlife Service at the address below, or visit *http://www.fws.gov/endangered/*.

U. S. Fish and Wildlife Service
Endangered Species Program
4401 N. Fairfax Drive, Room 420
Arlington, VA 22203
703-358-2171
http://www.fws.gov/endangered/

January 2013

http://www.epa.gov/compliance/basics/nepa.html
Last updated on 6/25/2012

National Environmental Policy Act (NEPA)

Basic Information

The National Environmental Policy Act (NEPA) [42 U.S.C. 4321 et seq.] was signed into law on January 1, 1970. The Act establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. The Act also establishes the Council on Environmental Quality (CEQ). The complete text of the law is available for review at NEPAnet.

NEPA Requirements

Title I of NEPA contains a Declaration of National Environmental Policy which requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony. Section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. These statements are commonly referred to as environmental impact statements (EISs).

Title II of NEPA establishes the Council on Environmental Quality (CEQ).

Oversight Of NEPA

The Council on Environmental Quality, which is headed by a fulltime Chair, oversees NEPA. A staff assists the Council. The duties and functions of the Council are listed in Title II, Section 204 of NEPA and include:

- Gathering information on the conditions and trends in environmental quality
- Evaluating federal programs in light of the goals established in Title I of the Act
- Developing and promoting national policies to improve environmental quality
- Conducting studies, surveys, research, and analyses relating to ecosystems and environmental quality.

Implementation

In 1978, CEQ promulgated regulations [40 CFR Parts 1500-15081] implementing NEPA which are

binding on all federal agencies. The regulations address the procedural provisions of NEPA and the administration of the NEPA process, including preparation of EISs. To date, the only change in the NEPA regulations occurred on May 27, 1986, when CEQ amended Section 1502.22 of its regulations to clarify how agencies are to carry out their environmental evaluations in situations where information is incomplete or unavailable.

CEQ has also issued guidance on various aspects of the regulations including: an information document on "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act," Scoping Guidance, and Guidance Regarding NEPA Regulations. Additionally, most federal agencies have promulgated their own NEPA regulations and guidance which generally follow the CEQ procedures but are tailored for the specific mission and activities of the agency.

The NEPA Process

The NEPA process consists of an evaluation of the environmental effects of a federal undertaking including its alternatives. There are three levels of analysis: categorical exclusion determination; preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and preparation of an environmental impact statement (EIS).

- **Categorical Exclusion**: At the first level, an undertaking may be categorically excluded from a detailed environmental analysis if it meets certain criteria which a federal agency has previously determined as having no significant environmental impact. A number of agencies have developed lists of actions which are normally categorically excluded from environmental evaluation under their NEPA regulations.
- **EA/FONSI:** At the second level of analysis, a federal agency prepares a written environmental assessment (EA) to determine whether or not a federal undertaking would significantly affect the environment. If the answer is no, the agency issues a finding of no significant impact (FONSI). The FONSI may address measures which an agency will take to mitigate potentially significant impacts.
- **EIS**: If the EA determines that the environmental consequences of a proposed federal undertaking may be significant, an EIS is prepared. An EIS is a more detailed evaluation of the proposed action and alternatives. The public, other federal agencies and outside parties may provide input into the preparation of an EIS and then comment on the draft EIS when it is completed.

If a federal agency anticipates that an undertaking may significantly impact the environment, or if a project is environmentally controversial, a federal agency may choose to prepare an EIS without having to first prepare an EA.
After a final EIS is prepared and at the time of its decision, a federal agency will prepare a public record of its decision addressing how the findings of the EIS, including consideration of alternatives, were incorporated into the agency's decision-making process.

EA And EIS Components

An EA is described in Section 1508.9 of the CEQ NEPA regulations. Generally, an EA includes brief discussions of the following:

- The need for the proposal
- Alternatives (when there is an unresolved conflict concerning alternative uses of available resources)
- The environmental impacts of the proposed action and alternatives
- A listing of agencies and persons consulted.

An EIS, which is described in Part 1502 of the regulations, should include:

- Discussions of the purpose of and need for the action
- Alternatives
- The affected environment
- The environmental consequences of the proposed action
- Lists of preparers, agencies, organizations and persons to whom the statement is sent
- An index
- An appendix (if any)

Federal Agency Role

The role of a federal agency in the NEPA process depends on the agency's expertise and relationship to the proposed undertaking. The agency carrying out the federal action is responsible for complying with the requirements of NEPA.

- **Lead Agency:** In some cases, there may be more than one federal agency involved in an undertaking. In this situation, a lead agency is designated to supervise preparation of the environmental analysis. Federal agencies, together with state, tribal or local agencies, may act as joint lead agencies.
- **Cooperating Agency:** A federal, state, tribal or local agency having special expertise with respect to an environmental issue or jurisdiction by law may be a cooperating agency in the NEPA process. A cooperating agency has the responsibility to assist the lead agency by participating in the NEPA process at the earliest possible time; by participating in the scoping process; in developing information and preparing environmental analyses including portions of the environmental impact statement concerning which the cooperating agency has special expertise; and in making available staff support at the lead agency's request to enhance the lead agency's interdisciplinary capabilities.
- **Council of Environmental Quality (CEQ):** Under Section 1504 of CEQ's NEPA regulations, federal agencies may refer to CEQ on interagency disagreements concerning proposed federal actions that might cause unsatisfactory environmental effects. CEQ's role, when it accepts a referral, is generally to develop findings and recommendations, consistent with the policy goals of Section 101 of NEPA.

EPA's Role

The Environmental Protection Agency (EPA), like other federal agencies, prepares and reviews NEPA documents. However, EPA has a unique responsibility in the NEPA review process. Under Section 309 of the Clean Air Act, EPA is required to review and publicly comment on the environmental impacts of major federal actions, including actions which are the subject of EISs. If EPA determines that the action is environmentally unsatisfactory, it is required by Section 309 to refer the matter to CEQ.

In accordance with a Memorandum of Agreement between EPA and CEQ, EPA carries out the operational duties associated with the administrative aspects of the EIS filing process. The Office of Federal Activities in EPA has been designated the official recipient in EPA of all EISs prepared by federal agencies.

The Public's Role

The public has an important role in the NEPA process, particularly during scoping, in providing input on what issues should be addressed in an EIS and in commenting on the findings in an agency's NEPA documents. The public can participate in the NEPA process by attending NEPA-related hearings or public meetings and by submitting comments directly to the lead agency. The lead agency must take into consideration all comments received from the public and other parties on NEPA documents during the comment period.

North American Wetlands Conservation Fund

NAWCF
Number: 15.623
Agency: Department of the Interior
Office: Fish and Wildlife Service

PROGRAM INFORMATION

Authorization (040):

North American Wetlands Conservation Act, Public Law 101-233, as amended, 16 U.S.C. 4401.

Objectives (050):

To provide grant funds for wetlands conservation projects in the United States, Canada, and Mexico.

Types of Assistance (060):

Project Grants (Discretionary)

Uses and Use Restrictions (070):

Funds may be used to acquire real property interest in lands or waters, including water rights. Funds may also be used to restore, manage, and/or enhance wetland ecosystems and other habitat for migratory birds and other fish and wildlife. Projects must provide long-term conservation for wetlands-associated migratory birds and other wetlands-associated wildlife. Coastal Wetlands Planning, Protection and Restoration act-derived funds eligible for NAWCA projects may be used only in U.S. coastal wetlands ecosystems. More specific restrictions are outlined on the NAWCA grants information and instructions website. For further information, please contact the headquarters office. 100%.

Eligibility Requirements (080)

Applicant Eligibility (081):

Available to private or public organizations or to individuals who have developed partnerships to carry out wetlands conservation projects in the U.S., Canada, and Mexico.

Beneficiary Eligibility (082):

Available to any private or public organization or individual.

Credentials/Documentation (083):

No Credentials or documentation are required. This program is excluded from coverage under OMB Circular No. A-87.

Application and Award Process (090)

Preapplication Coordination (091):

Preapplication coordination is not applicable. Environmental impact information is not required for this program.

This program is excluded from coverage under E.O. 12372.

Application Procedures (092):
OMB Circular No. A-102 applies to this program. OMB Circular No. A-110 applies to this program. Complete program information and application instruction can be found on the Division of Bird Habitat Conservation (DBHC) website, at http://www.fws.gov/birdhabitat/Grants/NAWCA, or can be accessed through grants.gov. Grant applications, including Standard Form 424 Application for Federal Assistance, and the appropriate Assurance forms (SF 424C or SF 424D) are submitted through www.grants.gov.

Award Procedure (093):
Applications are screened by Fish and Wildlife Service staff, and further reviewed and ranked by the North American Wetlands Conservation Council (Council) Staff and North American Waterfowl Management Plan Joint Venture Coordinators. Site visits are conducted as needed. Grant proposals are recommended for approval by the Council to the Migratory Bird Conservation Commission (Commission). The Council selects proposals in June and December that are recommended to the Commission for final funding approval in September and March. The grant is administered by FWS Division of Bird Habitat Conservation. The U.S. Fish and Wildlife Service conducts a National Environmental Policy Act and National Historic Preservation Act review of the projects that the Council selects to recommend to the Commission.

Deadlines (094):
Jul 08, 2014: U.S. Standard Grants. 2014 deadlines are: Standard grants February 28 & July 8, Mexico grants June 2, Canada grants September 1, Small grants November 7.

Range of Approval/Disapproval Time (095):
The range of time from proposal submission to the approval/disapproval notification is 7 to 10 months.

Appeals (096):
Not Applicable.

Renewals (097):
Proposals are funded on a project-specific basis. Requests for future funding must compete with other requests for project funding. A grant agreement can be modified or extended at the discretion of the Division of Bird Habitat Conservation.

Assistance Consideration (100)

Formula and Matching Requirements (101):
This program has no statutory formula.
Matching Requirements: The required matching share varies on a grant-by-grant basis and is set forth in the grant award, but must be at least 50 percent of the project costs, except that the project activities located on Federal lands and waters can be funded with 100 percent Federal funding.
MOE requirements are not applicable to this program.

Length and Time Phasing of Assistance (102):
Grant funds should be spent within the 1-2 year grant period, although the grant period can be extended for reasonable cause. All grants issued to non-Federal U.S. entities are paid through the Department of Treasury's Automated Standard Application for Payments System. Funds provided directly to a Federal entity by FWS are governed by a separate agreement between FWS and the recipient Federal entity. See the following for information on how assistance is awarded/released: Program obligates funds and sends a notice of award to successful applicants. Recipients request funds in accordance with 43 CFR Part 12, unless otherwise dictated by program-specific legislation or special award terms. Program will include any special payment terms and

conditions in the notice of award.

Post Assistance Requirements (110)

Reports (111):
Final reports must be filed with the Division of Bird Habitat Conservation within 90 days of the end of the project expiration or termination date. Quarterly financial reports are required for recipients opting to receive grant funds in advance of expenditure. Recipients must submit a final performance report no later than 90 calendar days after the award end date. Recipients of awards with performance periods longer than 12 months will be required to submit interim reports. Program may require recipients to submit interim reports annually, semiannually, or quarterly. Program will detail all performance reporting requirements, including frequency and due dates, in the notice of award letter. Recipients must report expenditures using the SF 425, Federal Financial Report form. Recipients must submit a final report no later than 90 calendar days after the award end date. Recipients of awards with performance periods longer than 12 months will be required to submit interim reports. Program may require recipients to submit interim reports annually, semiannually, or quarterly. Program will detail all financial reporting requirements, including frequency and due dates, in the notice of award letter. Recipients are responsible for monitoring and reporting performance each award and sub-award under this program in accordance with 43 CFR Part 12 and 2 CFR Part 170.

Audits (112):
In accordance with the provisions of OMB Circular No. A-133 (Revised, June 27, 2003), "Audits of States, Local Governments, and Non-Profit Organizations," nonfederal entities that expend financial assistance of $500,000 or more in Federal awards will have a single or a program-specific audit conducted for that year. Nonfederal entities that expend less than $500,000 a year in Federal awards are exempt from Federal audit requirements for that year, except as noted in Circular No. A-133.

Records (113):
The Recipient shall maintain a complete, detailed accounting system to report expenditures of grant funds and a detailed accounting of receipts and expenditures of non-Federal matching dollars or value of services. Records, accounts, and supporting documents must be retained for 3 years after submission of final report.

Financial Information (120)

Account Identification (121):
14-5241-0-2-302.

Obligations (122):
(Project Grants (Discretionary)) FY 13 $61,579,941; FY 14 est $77,602,527; and FY 15 est $70,000,000 - FY14 and FY15 amounts are estimates based on prior year funding levels only.

Range and Average of Financial Assistance (123):
Range is $0 to $75,000 for Small Grants; over $75,000 to $1,000,000 for U.S. Standard Grants. Average award is approximately $42,000 and $710,000 for Small Grants and U.S. Standard Grants, respectively.

Program Accomplishments (130):
Fiscal Year 2013: In FY13 NAWCA grants improved over 333,000 acres of habitat and protected over 576,000 acres of habitat for the benefit of migratory birds and other species. The program received 230 applications and issued 123 awards. Fiscal Year 2014: Program received 236 applications and anticipates issuing 125 awards. Fiscal Year 2015: Program anticipates receiving 236 applications and issuing 125 awards.

Regulations, Guidelines, and Literature (140):
U.S. Standard Grants Application Instructions; Small Grants Instructions; U.S. Grant Administration Standards; 43 CFR Part 12 and 49 CFR Part 24.

Information Contacts (150)

Regional or Local Office (151) :
See Regional Agency Offices. Regional Office or Local Office For additional program information, see Appendix IV for addresses of USFWS Regional Offices.

Headquarters Office (152):
Chief, Office Fish and Wildlife Service, Department of the Interior, Washington, DC 20240. Division of Bird Habitat Conservation, MBSP 4075, 4401 N. Fairfax Drive, Arlington, Virginia 22203 Phone: (703) 358-1784.

Website Address (153):
http://www.fws.gov/birdhabitat/Grants/NAWCA

Related Programs (160):
15.605 Sport Fish Restoration Program; 15.611 Wildlife Restoration; 15.614 Coastal Wetlands Planning, Protection and Restoration Act; 15.635 Neotropical Migratory Bird Conservation

Examples of Funded Projects (170):
Fiscal Year 2013: The Delaware Bayshore Land Conservation Initiative project will permanently protect 809 acres in the Delaware Bayshore Focus Area, filling a gap in an otherwise contiguous network of 4,064 acres of protected wetlands and uplands in the St. Jones River watershed. Fiscal Year 2014: Upper Iowa Prairie Pothole Partnership phase 3 project will use grants funds to protect lands along the Little Sioux River Valley and restore high quality wetland complexes that were formerly drained. Iowa's Prairie Pothole Region is a geographic priority wetlands area of continental significance to North American ducks, geese, and swans. Fiscal Year 2015: Program has not yet selected projects for funding. Program anticipates funding projects that protect and improve habitat for migratory birds and other wetland-associated species.

Criteria for Selecting Proposals (180):
The Council selects proposals based on factors given in Section 5 of the North American Wetlands Conservation Act, results of site visits, available funds and other factors deemed important to meeting Act objectives.

Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service

Emergency Wetlands Resources Act of 1986

This Act, Public Law 99-645 (100 Stat. 3582), approved November 10, 1986, authorized the purchase of wetlands from Land and Water Conservation Fund monies, removing a prior prohibition on such acquisitions. It required the Secretary to establish a National Wetlands Priority Conservation Plan, required the States to include wetlands in their Comprehensive Outdoor Recreation Plans, and transferred to the Migratory Bird Conservation Fund amounts equal to the import duties on arms and ammunition.

It extended the Wetlands Loan Act authorization through 1988, and forgave the previous advances under the Act. It also required the Secretary to report to Congress on wetlands loss, including an analysis of the role of Federal programs and policies in inducing such losses. In addition, it directed the Secretary, through the Service, to continue the National Wetlands Inventory; to complete by September 30, 1998, mapping of the contiguous United States; to produce, as soon as practicable, maps of Alaska and other noncontiguous portions of the United States; and to produce, by September 30, 1990, and at ten-year intervals thereafter, reports to update and improve in the September 1982 "Status and Trends of Wetlands and Deepwater Habitat in the Coterminous United States, 1950's to 1970's."

Other provisions included: the establishment of entrance fees at National Wildlife Refuges, with fee receipts to be allocated 70 percent into the Migratory Bird Conservation Fund and 30 percent for operations and maintenance at the refuges; an increase in the price of duck stamps from $7.50 to $15.00, to be phased in through 1991; and the establishment of the Bayou Sauvage National Wildlife Refuge in Louisiana.

Sec. 315 of the FY 1996 Interior Appropriation Act (P.L. 104-4; 110 Stat. 1321), as amended by P.L. 104-28 (110 Stat. 3009), P.L. 105-18, (111 Stat. 158) and P.L.105-83 (111 Stat. 1543) established a Demonstration Fee program for entrance and recreational use fees, allowing participating refuges and other agency areas to retain at least 80% of collected fees at the collecting site; this supercedes the 70-30 fee allocation established in the Emergency Wetlands Act.

Return to Resource Laws

EPA United States Environmental Protection Agency

Clean Air Act
Clean Air Act Requirements and History

Congress designed the Clean Air Act to protect public health and welfare from different types of air pollution caused by a diverse array of pollution sources.

Congress established much of the basic structure of the Clean Air Act in 1970, and made major revisions in 1977 and 1990. Dense, visible smog in many of the nation's cities and industrial centers helped to prompt passage of the 1970 legislation at the height of the national environmental movement. The subsequent revisions were designed to improve its effectiveness and to target newly recognized air pollution problems such as acid rain and damage to the stratospheric ozone layer.

This page provides a brief introduction to the Clean Air Act, links to more detailed information on the law's requirements, and links to information on its history.

Control of common pollutants

To protect public health and welfare nationwide, the Clean Air Act requires EPA to establish national ambient air quality standards for certain common and widespread pollutants based on the latest science. EPA has set air quality standards for six common "criteria pollutants": particulate matter (also known as particle pollution), ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead.

States are required to adopt enforceable plans to achieve and maintain air quality meeting the air quality standards. State plans also must control emissions that drift across state lines and harm air quality in downwind states.

Other key provisions are designed to minimize pollution increases from growing numbers of motor vehicles, and from new or expanded industrial plants. The law calls for new stationary sources (e.g., power plants and factories) to use the best available technology, and allows less stringent standards for existing sources.

Other air pollution problems targeted by Congress

The Act also contains specific provisions to address:

- Hazardous or toxic air pollutants that pose health risks such as cancer or environmental threats such as bioaccumulation of heavy metals
- Acid rain that damages aquatic life, forests and property
- Chemical emissions that deplete the stratospheric ozone layer, which protects us from skin cancer and eye damage
- Regional haze that impairs visibility in national parks and other recreational areas

Pollution problems emerging after enactment

In addition to creating programs to solve identified pollution problems, Congress drafted the Act with general authorities that can be used to address pollution problems that emerge over time, such as greenhouse gases that cause climate change.

Learn more about Clean Air Act requirements (22 pp, 231K, About PDF)

Clean Air Act Requirements

For description of CAA requirements, see the following resources:

- Plain English Guide to the Clean Air Act
- The Clean Air Act in a Nutshell: Summary of Major Provisions by Pollution Problem (22 pp, 231K, About PDF)
- Summary of the Clean Air Act Amendments of 1990
- The official text of the CAA is available at Title 42 , Chapter 85 in the *United States Code* on FDSys, from the US Government Printing Office
- More CAA information
- Text of the Clean Air Act

Clean Air Act History

- Clean Air Act history information from 40th Anniversary Event
- Photos of historical air pollution
- Clean Air Act 1970/1977
- Clean Air Act 1990
- Evolution of the CAA

WETLAND RESOURCES

This section includes:

- ***Suggested Reading for Students***
- ***Wetland Educational Resources***
- ***Bibliography***

Suggested Reading List

Biomes of the Earth
Volume Four: Wetlands
Allaby, Michael
© 1999
ISBN 0-7172-9345-9

Wetlands
Darlene R. Stille
© 1999
ISBN-13: 9780516215129

Wetlands
Catherine Nichols
© 2002
ISBN-13: 9780761414346

Swamp Life
Greenaway, Theresa
© 1993

Wetlands
Hickman, Pamela
© 1993

Wetlands
Rood, Ronald
© 1994
ISBN 0-06-023010-X. - ISBN 0-06-023011-8

WETLAND EDUCATION RESOURCES

- *ODNR-Division of Wildlife*

Aquatic Project WILD; Wetlands Workshops (Aquatic Resources Education); Angler Education; Wetland Education Resources.
http://www.dnr.state.oh.us/Education/Test/EducationSearch/tabid/10522/Default.aspx

- *National Wildlife Federation*

National Wildlife Week; Ranger Rick Magazine; Ranger Rick's Nature Scope; Wading into Wetlands
http://www.nwf.org

- *Natural Resources Conservation Service*

Harmony Action Packs: Get Wet, Watershed Health
http://www.nrcs.usda.gov

- *Ducks Unlimited*

Ducks Unlimited Greenwings: Puddler Magazine.
http://www.ducks.org

- *The Columbus Zoo and Aquarium*

Wetlands Workshops for teachers; loaner kits: Swamp Things.
http://www.colszoo.org

- *Rocky Mountain Elk Foundation*

W.O.W. (Wonderful Outdoor World Magazine)
http://www.rmef.org

- *Outdoor Biology Instructional Strategies (OBIS)*

Thematic outdoor activity library (available from Delta Education)
http://lawrencehallofscience.stores.yahoo.net/outbiolinstr.html

- *Delta Education*

Classroom supplies, FOSS Kits, science modules; a popular commercial vendor.
http://www.delta-education.com/index.html

- *Acorn Naturalist*

Resources for the trail and classroom, including an excellent library of children's and topic books including wetlands.
http://www.acornnaturalists.com

- *ODNR-Division of Natural Areas and Preserves*

Volunteer Stream Water Quality Monitoring Program for schools.
http://www.dnr.state.oh.us/Home/Scenic_Rivers/sqm/sqm_main/tabid/980/Default.aspx

- *ODNR-Division of Water*

Project WET; Make A Splash Festivals.
http://www.dnr.state.oh.us/water/educate/default/tabid/3479/Default.aspx

- *The Watercourse*

WOW! The Wonders of Wetlands, (A wetlands module of Project WET)
http://www.projectwet.org

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Quotes from: An Audubon Handbook-Eastern Birds
Farrand, John Jr.
McGraw-Hill Book Company
New York, New York
© 1988

Biomes of the Earth
Volume Four: Wetlands
Allaby, Michael
Grolier Educational
Danbury, Connecticut
© 1999

The Book of Swamp and Bog
Eastman, John
Stackpole Books
Mechanicsburg, Pennsylvania
© 1995

The Complete Tracker: Tracks, Signs, and Habitats of North American Wildlife
McDougall, Len
Lychs and Burford Publishers
New York, New York
© 1997

Harper and Row's Complete Guide to North American Wildlife
Assembled by Ransom, Jay Ellis
Harper and Row Publishers
New York, New York
© 1981

Marshes and Swamps
Stone, Lynn M.
Children's Press
Chicago, Illinois
© 1983

North American Wildlife: Mammals, Reptiles, and Amphibians
Editors: Barnard, Edward S.; Yates, Sharon Fass
Reader's Digest Association, Inc
USA
© 1998

Save Our Wetlands
Hirschi, Ron
Delacorte Press
New York, New York
© 1994

Swamp Life
Greenaway, Theresa
Dorling Kindersley
New York, New York
© 1993

Waterfowl: An Identification to the Ducks, Geese and Swans of the World
Madge, Steve and Burn, Hillary
Houghton Mifflin Company
Boston, Massachusetts
© 1988

Wetlands
Hickman, Pamela
Kids Can Press
Toronto, Canada
© 1993

Wetlands
Rood, Ronald
Harper Collins Publishers
New York, New York
© 1994

Project WILD and *Project WILD Aquatic*
Council for Environmental Education
Houston, Texas
© 2000

Life Histories (series)
Ohio Department of Natural Resources
Division of Wildlife
2045 Morse Rd, Building G
Columbus, Ohio 43229
© 1999

Ohio Department of Natural Resources
Division of Natural Areas and Preserves
2045 Morse Rd
Columbus, Ohio 43229

U.S. Department of the Interior's Fish and Wildlife Service's Trends and Statistics Report
ftd://wetlands.fws.gov/status-trends/sandt2000report_lowres.pdf

Great Lakes Commission
400 Fourth Street
Ann Arbor, Michigan 48103
http://www.glc.org

National Audubon Society
700 Broadway
New York, New York 10003
http://www.audubon.org

National Wildlife Federation
11100 Wildlife Center Drive
Reston, Virginia 20190
http://www.nwf.org

The Nature Conservancy
4245 North Fairfax Drive, Suite 100
Arlington, Virginia 22203
http://www.nature.org

Ohio Department of Natural Resources
Fountain Square
Columbus, Ohio 43224
http://www.dnr.state.oh.us

Ohio Wetlands Foundation
3675 Africa Road
Galena, Ohio 43021
http://www.ohiowetlands.org

U.S. Department of the Interior
Fish and Wildlife Service
1849 C. Street NW
Washington, DC 20240
http://www.fws.gov

United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460
http://www.epa.gov

The Wetlands Regulation Center
834 Castle Ridge Road
Austin, Texas 78746
http://www.wetlands.com

For More Information on Ohio's Wildlife and Project WILD, Contact Your Local Office:

- **ODNR-DIVISION OF WILDLIFE CENTRAL OFFICE** — **1-800-WILDLIFE OR 614-265-6300**
  2045 MORSE RD., BLDG G., COLUMBUS, OH 43229 — **www.ohiodnr.com/wildlife**
- **DIVISION OF WILDLIFE—DISTRICT 1 OFFICE** — **614-644-3925**
  1500 DUBLIN RD., COLUMBUS, OH 43215
- **DIVISION OF WILDLIFE—DISTRICT 2 OFFICE** — **419-424-5000**
  952 LIMA AVE., FINDLAY, OH 45840
- **DIVISION OF WILDLIFE—DISTRICT 3 OFFICE** — **330-644-2293**
  912 PORTAGE LAKES DR., AKRON, OH 44319
- **DIVISION OF WILDLIFE—DISTRICT 4 OFFICE** — **740-589-9930**
  360 E. STATE ST., ATHENS, OH 45701
- **DIVISION OF WILDLIFE—DISTRICT 5 OFFICE** — **937-372-9261**
  1076 OLD SPRINGFIELD PK., XENIA, OH 45385

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