

**GREGORY M. KENNAN**  
**129 Hollis St.**  
**Sherborn, MA 01770**

December 3, 2015

Alan Rubenstein, Chair  
Zoning Board of Appeals  
19 Washington St.  
Sherborn, MA 01770

Re: Fields at Sherborn

Dear Chairman Rubenstein and Board Members:

At the hearing on November 23rd, the Board posed several questions on the issue of why protecting the wetlands adjacent to the proposed Fields at Sherborn development was important to protecting the people of Sherborn. I am writing to offer some information on the functions and value of wetlands and the potential effects of the Field of Sherborn proposal on the adjacent wetlands. I hope that this information will be helpful to inform your decisionmaking on the applicant's request for a waiver of certain provisions of the Sherborn Wetland Bylaw, in particular the request to waive section 3.4, the provision requiring a 50-foot no-alteration zone.

Relaxation of the no-alteration zone potentially will have harmful effects on human health and the environment in the vicinity of the project, but also more generally on the Town as a whole.

By way of background, I formerly served as an enforcement attorney for the U.S. Environmental Protection Agency, addressing all aspects of environmental enforcement and compliance, including wetlands protection. I also formerly served on the Conservation Commission. The views expressed in this letter, however, are my own.

### **Functions Performed by Wetlands**

Wetlands are valuable because they clean the water, recharge water supplies, reduce flood risks, and provide fish and wildlife habitat. U.S. EPA, *Functions and Values of Wetlands*, p. 1, [http://water.epa.gov/type/wetlands/outreach/upload/fun\\_val\\_pr.pdf](http://water.epa.gov/type/wetlands/outreach/upload/fun_val_pr.pdf) (Attachment 1).

***Drinking Water Protection.*** Of particular interest to a town like Sherborn with its exclusive reliance on private wells for drinking water, wetlands perform an important role in the protection of drinking water quality. Wetlands are natural water filters. Wetland plants and soils remove pollutants and toxic substances from water. Some pollutants are captured and held in the roots of wetland plants. Some wetland soils have beneficial bacteria that capture other pollutants like nitrates. Wetland plants also filter sediments and recycle important nutrients.

Some wetlands contribute to the drinking water supply by collecting and releasing water to groundwater systems and surface water reservoirs. The degradation and loss of wetlands can impact water supplies, in some cases, resulting in water shortages that require water-use

restrictions. Mass. DEP, *Wetlands: Our "Common Wealth,"*  
<http://www.mass.gov/eea/agencies/massdep/water/watersheds/wetlands-our-common-wealth.html> (Attachment 2).

**Flood Control.** Wetlands temporarily store flood waters. Like sponges, wetlands hold excess water within their boundaries and then slowly release the water back to rivers and ponds. Wetland plants also slow the flow of water. This delaying action prevents flood waters from rising rapidly and threatening lives and property. In contrast, paved areas cannot absorb water and sometimes can increase storm damage by providing a smooth, impervious surface for water to flow over, which increases the speed of flood waters. Mass. DEP, *Wetlands: Our "Common Wealth."*

**Biological Productivity.** Wetlands are some of the most biologically productive natural ecosystems in the world, comparable to tropical rain forests and coral reefs in their productivity and the diversity of species they support. Abundant vegetation and shallow water provide diverse habitats for fish and wildlife. Aquatic plant life flourishes in the nutrient-rich environment, and energy converted by the plants is passed up the food chain to fish, waterfowl, and other wildlife and to us as well. This function supports valuable commercial fish and shellfish industries. U.S. EPA, *Functions and Values*, p. 2.

### Threats to Wetlands

Destroying or degrading wetlands can lead to serious consequences, such as increased flooding, extinction of species, and decline in water quality.

When a wetland functions properly, it provides water quality protection, fish and wildlife habitat, natural floodwater storage, and reduction in the erosive potential of surface water. A degraded wetland is less able to effectively perform these functions. For this reason, wetland degradation is as big a problem as outright wetland loss, though often more difficult to identify and quantify.

Wetlands may be degraded by a number of human activities. Examples are set forth below. U.S. EPA, *Threats to Wetlands*, pp. 1-2.  
[http://water.epa.gov/type/wetlands/outreach/upload/threats\\_pr.pdf](http://water.epa.gov/type/wetlands/outreach/upload/threats_pr.pdf) (Attachment 3)

**Hydrologic Alterations.** One threat to wetlands is hydrologic alterations. These include but are not limited to diversion of flow to or from the wetland, and addition of impervious surfaces in the watershed, such as buildings and parking lots, thereby increasing water and pollutant runoff into wetlands.

I note in particular the large amount of impervious surface in the vicinity of proposed units 18 through 21. These areas will alter the flow in the vicinity of the adjacent wetland. Further, a large area of what appears to be lawn in the no-alteration zone is depicted on the landscape plan between units 19 and 20. The alteration of the contour in the lawn area, the replacement of the current vegetation with lawn, and the introduction of sprinkler water to an

area where it has not existed before all will alter the flow in the wetland, with potentially harmful results. Regrading in the area of proposed units 29-33 would appear to pose similar threats.

**Pollution Inputs.** Another type of degradation resulting from human activities is increased pollution inputs. Although wetlands are capable of absorbing pollutants from the surface water, there is a limit to their capacity to do so. The primary pollutants causing wetland degradation are sediment, fertilizer, human sewage, animal waste, road salts, pesticides, heavy metals, and selenium.

One example of potentially harmful changes is the above-described impervious surfaces introduced by units 19 and 20 and their associated parking and walkway areas. Runoff from these areas may introduce road salt, automotive fluids, and pet waste into the wetland. Further, the irrigated lawn area in the no-alteration zone between units 19 and 20 potentially threatens the wetland by the introduction of sediment from construction and subsequent irrigation activities, and well as ongoing introduction of fertilizer and pesticides transported by irrigation runoff. To the extent that the regraded areas in the vicinity of units 29-33 result in the introduction of pollutants transported by runoff from irrigation or other sources, similar threats would be posed.

**Vegetation Damage.** Vegetation damage is another threat. Wetland plants, essential to the functioning of the wetland, are susceptible to degradation if subjected to hydrological changes and pollution inputs.

### Conclusion

I respectfully urge that the Board give all due consideration to the benefits that functioning wetlands provide, and the nature and magnitude of the threats from degradation of those wetlands caused by the hydrological alteration, increased pollution inputs, and damage to vegetation that inevitably will result from construction of the Fields at Sherborn project, in particular within the no-alteration zone but also more generally in close proximity to the wetlands. The EPA states that it is "imperative that the public participate in wetland management and protection." One of the U.S. EPA's recommendations is to "[w]ork with your local municipalities and state to develop laws and ordinances that protect and restore wetlands." *Threats to Wetlands*, p. 2. A necessary part of that effort is to enforce municipal ordinances already on the books, such as section 3.4 of the Sherborn By-law. It is critical that the Board act to protect to the fullest possible extent the wetlands and the valuable functions they perform.

Sincerely,



Gregory M. Kennan

## **Attachment 1**

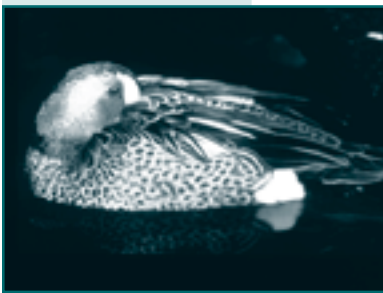


# Functions and Values of Wetlands

Dave Davis



Wetlands are considered valuable because they clean the water, recharge water supplies, reduce flood risks, and provide fish and wildlife habitat. In addition, wetlands provide recreational opportunities, aesthetic benefits, sites for research and education, and commercial fishery benefits.



Long regarded as wastelands, wetlands are now recognized as important features in the landscape that provide numerous beneficial services for people and for fish and wildlife. Some of these services, or functions, include protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters, and maintaining surface water flow during dry periods. These beneficial services, considered valuable to societies worldwide, are the result of the inherent and unique natural characteristics of wetlands.



## Functions Versus Values

Wetland functions include water quality improvement, floodwater storage, fish and wildlife habitat, aesthetics, and biological productivity. The value of a wetland is an estimate of the importance or worth of one or more of its functions to society. For example, a value can be determined by the revenue generated from the sale of fish that depend on the wetland, by the tourist dollars associated with the wetland, or by public support for protecting fish and wildlife.

Although large-scale benefits of functions can be valued, determining the value of individual wetlands is difficult because they differ widely and do not all perform the same functions or perform functions equally well. Decision-makers must understand that impacts on wetland functions can eliminate or diminish the values of wetlands.

**Water storage.** Wetlands function like natural tubs or sponges, storing water and slowly releasing it. This process slows the water's momentum and erosive potential, reduces flood heights, and allows for ground water recharge, which contributes to base flow to surface water systems during dry periods.

Although a small wetland might not store much water, a network of many small wetlands can store an enormous amount of water. The ability of wetlands to store floodwaters reduces the risk of costly

property damage and loss of life—benefits that have economic value to us. For example, the U.S. Army Corps of Engineers found that protecting wetlands along the Charles River in Boston, Massachusetts, saved \$17 million in potential flood damage.

**Water filtration.** After being slowed by a wetland, water moves around plants, allowing the suspended sediment to drop out and settle to the wetland floor. Nutrients from fertilizer application, manure, leaking septic tanks, and municipal sewage that are dissolved in the water are often absorbed by plant roots and microorganisms in the soil. Other pollutants stick to soil particles. In many cases, this filtration process removes much of the water's nutrient and pollutant load by the time it leaves a wetland. Some types of wetlands are so good at this filtration function that environmental managers construct similar artificial wetlands to treat storm water and wastewater.



Red-osier dogwood

**Biological productivity.** Wetlands are some of the most biologically productive natural ecosystems in the world, comparable to tropical rain forests and coral reefs in their productivity and the diversity of species they support. Abundant vegetation and shallow water provide diverse habitats for fish and wildlife. Aquatic plant life flourishes in the nutrient-rich environment, and energy converted by the plants is passed up the food chain to fish, waterfowl, and other wildlife and to us as well. This function supports valuable commercial fish and shellfish industries.



The Great Flood of 1993 in the upper Mississippi River Basin caused billions of dollars in property damage and resulted in 38 deaths. Historically, 20 million acres of wetlands in this area had been drained or filled, mostly for agricultural purposes. If the wetlands had been preserved rather than drained, much property damage and crop loss could have been avoided.

## DID YOU KNOW?

- In 1991 wetland-related ecotourism activities such as hunting, fishing, bird-watching, and photography added approximately \$59 billion to the national economy.
- According to the Pacific Coast Federation of Fishermen's Associations, almost \$79 billion per year is generated from wetland-dependent species, or about 71 percent of the nation's entire \$111 billion commercial and recreational fishing industry in 1997.
- An acre of wetland can store 1–1.5 million gallons of floodwater.
- Up to one-half of North American bird species nest or feed in wetlands.
- Although wetlands keep only about 5 percent of the land surface in the conterminous United States, they are home to 31 percent of our plant species.



Steve Delaney

Seventy-five percent of commercially harvested fish are wetland-dependent. Add shellfish species and that number jumps to 95 percent.

## The Wetland Fact Sheet Series



Wetlands Overview  
Types of Wetlands  
Functions & Values of Wetlands  
Threats to Wetlands  
Wetland Restoration

Funding Wetland Projects  
Wetland Monitoring & Assessment  
Sustainable Communities  
Volunteering for Wetlands  
Teaching about Wetlands

For more information, visit [www.epa.gov/owow/wetlands](http://www.epa.gov/owow/wetlands).

# Wetland Resources

## On the Internet

*Ecosystem Valuation* ..... [www.ecosystemvaluation.org](http://www.ecosystemvaluation.org)  
*Economic Valuation of Wetlands* ..... [www.ramsar.org/lib\\_val\\_e\\_index.htm](http://www.ramsar.org/lib_val_e_index.htm)

## In Print

*Restoration, Creation, and Recovery of Wetlands: Wetland Functions, Values, and Assessment*, R.P. Novitzki, R.D. Smith, and J.D. Fretwell. United States Geological Survey Water Supply Paper 2425. Available on-line at <http://water.usgs.gov/nwsum/WSP2425/functions.html>.

*Technical Aspects of Wetlands: Wetland Hydrology, Water Quality, and Associated Functions*, Virginia Carter. United States Geological Survey Water Supply Paper 2425. Available on-line at <http://water.usgs.gov/nwsum/WSP2425/hydrology.html>.

*Wetlands Functions and Values*. Visit the North Carolina State University Water Quality Group's on-line informational database, WATERSHEDSS, at <http://h2osparc.wq.ncsu.edu/info/wetlands/funval.html>.

## **Attachment 2**



The Official Website of the Executive Office of Energy and Environmental Affairs

## Energy and Environmental Affairs

🏠 EEA Home > Agencies > MassDEP > Water Resources > Wetlands & Watersheds > Wetlands: Our "Common Wealth"

### Wetlands: Our "Common Wealth"

#### Protecting Our "Common Wealth"

Wetlands are part of our "common wealth." They contribute to public health and safety, not only for you and your family, but for your community as well. Wetlands protect drinking water, prevent storm damage, and provide fish, shellfish, and wildlife habitats. Wetlands also support commercial fishing, tourism, recreation, and educational opportunities. These valuable resource areas are found in every community across Massachusetts and are an important part of a river's watershed. Although most wetlands are found on private property - maybe even yours - their benefits are important to everyone. Landowners have an important role in protecting wetlands.

#### What Are Wetlands?

Coastal wetlands are directly adjacent to the ocean and include beaches, salt marshes, dunes, coastal banks, rocky intertidal shores, and barrier beaches. Inland wetlands are areas where water is at or just below the surface of the ground. Although these wetlands can appear dry during some seasons, they contain enough water to support certain plants and soils. Inland wetlands include marshes, wet meadows, bogs, and swamps. Wetlands that border on ponds, lakes, rivers, and streams are called bordering vegetated wetlands.

#### Wetlands Are Not Wastelands

In the past, wetlands were mistakenly regarded as "wastelands" of mud and mosquitoes or simply as obstacles to economic development. However, scientific studies have shown that wetlands protect our health, safety, and property, as well as provide habitat for a variety of wildlife.

#### Drinking Water Protection

Wetlands are natural water filters. Wetland plants and soils remove pollutants and toxic substances from water. Some pollutants are held for years in the roots of plants such as arrowhead, cattails, and reed canary grass. Some wetland soils have beneficial bacteria that capture other pollutants like nitrates. Wetland plants also filter sediments and recycle important nutrients.

Some wetlands contribute to the drinking water supply by collecting and releasing water to groundwater systems and surface water reservoirs. The degradation and loss of wetlands can impact water supplies, in some cases, resulting in water shortages that require water-use restrictions.

#### Flood Control

Wetlands temporarily store flood waters. Like sponges, wetlands hold excess water within their boundaries and then slowly release the water back to rivers and ponds. Wetland plants also slow the flow of water. This delaying action prevents flood waters from rising rapidly and threatening lives and property. In contrast, paved areas cannot absorb water and sometimes can increase storm damage by providing a smooth, impervious surface for water to flow over, which increases the speed of flood waters. Coastal wetlands buffer uplands from storm damage. They absorb wave energy and reduce the height of storm waves. Wetland plants bind the soil and help slow shoreline erosion. These resource areas are so effective in controlling erosion and flooding that some coastal communities plant wetland plants and build artificial dunes to protect property.

#### Fish & Shellfish Habitat

Wetlands are important sources of food and shelter for fish and shellfish. They are spawning and nursery areas for a variety of saltwater and freshwater fish, including herring, flounder, sunfish, and bass. Shellfish like crabs, clams, and bay scallops depend on wetlands such as tidal flats and eelgrass beds for their survival. The fish and shellfish that were spawned in wetlands support the commercial fishing industry and provide food and income for many people. The degradation and loss of wetlands can harm fish and shellfish resources, which, in turn, can impact the fishing industry.

#### Wildlife Habitat

Many birds, reptiles, amphibians, mammals, insects, and plants depend on wetlands for their survival. Migratory birds like the red-winged blackbird find food and shelter in wetlands during their seasonal migrations. Shorebirds like the sandpiper use wetlands for food and shelter. Even bald eagles depend on wetlands. In addition, wetlands provide breeding areas for birds such as the wood duck.

Mammals depend on wetland habitats, too. Black bear, deer, and other large mammals often feed on wetland plants. Beavers and muskrats make their homes in ponds and streams, while weasels and otters find their food in marshes.

Wetlands provide habitat for many rare and endangered species such as the wood turtle, piping plover, blue-spotted salamander, and the Plymouth gentian flower.





## Natural Beauty & Recreation

In addition to health and safety benefits, wetlands offer natural beauty and recreational opportunities. These resource areas are available to everyone who enjoys the outdoors, such as hikers, hunters, sport fishermen, artists, and bird watchers. Wetlands also contribute to tourism and offer educational opportunities for adults and children. For many landowners and communities, wetlands represent open space - a valuable resource in urban and suburban landscapes.

## Worth Every Dollar

Since Colonial times, Massachusetts has lost nearly one third of its wetlands. The loss of wetlands means the loss of the important benefits they provide. Where wetlands once stored stormwater, homes downstream are now more vulnerable to flooding. Where wetlands once provided a critical line of defense from coastal storms, private and public property are now exposed to the full force of the ocean. Where wetlands once provided spawning grounds for fish and shellfish, shellfish beds are now closed and fisheries are diminished.

In economic terms, the cost of preserving wetlands in their natural state is far lower than the cost of repairing property that has been damaged or building structures or facilities to replace wetland functions.

## Wetlands Protection

Concerned about the historic loss of wetlands, the Massachusetts Legislature adopted the nation's first wetlands protection laws in the early 1960s. Today, wetlands are protected by state, federal, and sometimes local laws.

The Wetlands Protection Act (Massachusetts General Laws Chapter 131, Section 40) is a state law that prohibits the removal, dredging, filling, or altering of wetlands without a permit. This law is administered in each city or town by a local volunteer board called a conservation commission. The Department of Environmental Protection (MassDEP) oversees administration of the law by developing regulations, providing training to commissions, and hearing appeals of local commission decisions. The law protects not only wetlands, but other resource areas, such as land subject to flooding (100-year floodplains), the riverfront area, and land under water bodies, waterways, salt ponds, and the ocean.

Under Section 401 of the federal Clean Water Act, any discharge of dredged or fill material into waters or wetlands requires a state Water Quality Certification. MassDEP must certify that projects requiring federal permits do not violate the state's water quality standards, which include protection for wetlands.

In addition, some communities have their own wetlands protection bylaws. Contact the conservation commission at your city or town hall for more information about the state's Wetlands Protection Act and local wetlands bylaws.

## How You Can Help

By recognizing wetlands and understanding their benefits, landowners can make informed decisions that protect these valuable natural resources. You can help protect wetlands by:

- Learning more about wetlands and sharing that knowledge with others
- Joining or helping your local conservation commission or local watershed association
- Obeying wetlands protection laws

## For More Information

For more information, call the Department of Environmental Protection's Wetlands Protection Program in Boston at 617-292-5500 or MassDEP's Regional Service Centers at:

- Northeast (Wilmington): 978-694-3200
- Southeast (Lakeville): 508-946-2714
- Central (Worcester): 508-792-7683
- Western (Springfield): 413-784-2214

Did you find the information you were looking for on this page? \*

- Yes  
 No

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## **Attachment 3**



# Threats to Wetlands

Destroying or degrading wetlands can lead to serious consequences, such as increased flooding, extinction of species, and decline in water quality. We can avoid these consequences by maintaining the valuable wetlands we still have and restoring lost or impaired wetlands where possible.

## What Is the Status of Our Nation's Wetlands?

More than 220 million acres of wetlands are thought to have existed in the lower 48 states in the 1600s. Since then extensive losses have occurred, and more than half of our original wetlands have been drained and converted to other uses. The mid-1950s to the mid-1970s were a time of major national wetland loss. Since then the rate of loss has slowed.



The National Audubon Society notes that bird populations continue to decrease as wetlands are destroyed. In the past 15 years alone, the continental duck breeding population fell from 45 million to 31 million birds, a decline of 31 percent. The number of birds migrating over the Gulf of Mexico, which rely on coastal wetlands as staging areas (especially in Louisiana and Mississippi), has decreased by one-half since the mid-1960s. Approximately 100 million wetland acres remain in the 48 contiguous states, but they

continue to be lost at a rate of about 60,000 acres annually. Draining wetlands for agricultural purposes is significant, but declining, while development pressure is emerging as the largest cause of wetland loss.

Unfortunately, many remaining wetlands are in poor condition and many created wetlands fail to replace the diverse plant and animal communities of those destroyed.

When a wetland functions properly, it provides water quality protection, fish and wildlife habitat, natural floodwater storage, and reduction in the erosive potential of surface water. A degraded wetland is less able to effectively perform these functions. For this reason, wetland degradation is as big a problem as outright wetland loss, though often more difficult to identify and quantify.

## What Is Adversely Affecting Our Wetlands?

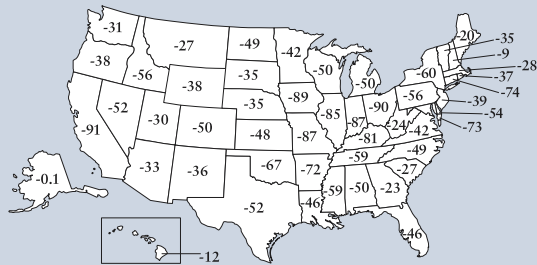
Human activities cause wetland degradation and loss by changing water quality, quantity, and flow rates; increasing pollutant inputs; and changing species composition as a result of disturbance and the introduction of nonnative species. Common human activities that cause degradation include the following:

**Hydrologic Alterations.** A wetland's characteristics evolve when hydrologic conditions cause the water table to saturate or inundate the soil for a certain amount of time each year. Any change in hydrology can significantly alter the soil chemistry and plant and animal communities. Common hydrologic alterations in wetland areas include:

- Deposition of fill material for development.
- Drainage for development, farming, and mosquito control.
- Dredging and stream channelization for navigation, development, and flood control.
- Diking and damming to form ponds and lakes.
- Diversion of flow to or from wetlands.
- Addition of impervious surfaces in the watershed, thereby increasing water and pollutant runoff into wetlands.

**Pollution Inputs.** Although wetlands are capable of absorbing pollutants from the surface water, there is a limit to their capacity to do so. The primary pollutants causing wetland degradation are sediment, fertilizer, human sewage, animal waste, road salts, pesticides, heavy metals, and

Percentage of Wetlands  
Acreage Lost, 1780s–1980s



Twenty-two states have lost at least 50 percent of their original wetlands. Since the 1970s, the most extensive losses have been in Louisiana, Mississippi, Arkansas, Florida, South Carolina, and North Carolina.

Source: *Wetlands*,  
2<sup>nd</sup> edition,  
Van Nostrand and  
Reinholdt, 1993.

selenium. Pollutants can originate from many sources, including:

- Runoff from urban, agricultural, silvicultural, and mining areas.
- Air pollution from cars, factories, and power plants.
- Old landfills and dumps that leak toxic substances.
- Marinas, where boats increase turbidity and release pollutants.



Pollutants such as sediment, nutrients, pesticides, and heavy metals degrade wetlands and water quality across the country.

**Vegetation Damage.** Wetland plants are susceptible to degradation if subjected to hydrological changes and pollution inputs. Other activities that can impair wetland vegetation include:

- Grazing by domestic animals.
- Introduction of nonnative plants that compete with natives.
- Removal of vegetation for peat mining.

### What Can You Do?

Nearly 75 percent of all wetlands are privately owned, making it imperative that the public participate in wetland management and protection. Here are some things you can do:

- Conserve and restore wetlands on your property.
- Support local wetlands and watershed protection initiatives by donating materials, time, or money.

- Work with your local municipalities and state to develop laws and ordinances that protect and restore wetlands.
- Purchase federal duck stamps from your local post office to support wetland acquisition.
- Participate in the Clean Water Act Section 404 program and state regulatory programs by reviewing public notices and commenting on applications.
- Encourage neighbors and developers to protect the function and value of wetlands in your watershed.
- Avoid wetland alteration or degradation during project construction.
- Maintain wetlands and adjacent buffer strips as open space.
- Reduce the amount of fertilizers, herbicides, and pesticides applied to lawns and gardens.



Swamp tupelo

## The Wetland Fact Sheet Series



**Wetlands Overview**  
**Types of Wetlands**  
**Functions & Values of Wetlands**  
**Threats to Wetlands**  
**Wetland Restoration**

**Funding Wetland Projects**  
**Wetland Monitoring & Assessment**  
**Sustainable Communities**  
**Volunteering for Wetlands**  
**Teaching about Wetlands**

For more information, visit [www.epa.gov/owow/wetlands](http://www.epa.gov/owow/wetlands).

## Wetland Resources

*A Global Overview of Wetland Loss and Degradation.* Available on The Ramsar Convention on Wetlands' web site at [www.ramsar.org/about\\_wetland\\_loss.htm](http://www.ramsar.org/about_wetland_loss.htm).

*Wetland Issues.* Available on-line at [www.nceonline.org/NLE/CRSreports/Wetlands/wet-5.cfm](http://www.nceonline.org/NLE/CRSreports/Wetlands/wet-5.cfm).

*Wetlands Loss and Degradation.* Visit the North Carolina State University Water Quality Group's on-line informational database, WATERSHEDSS, at [h2osparc.wq.ncsu.edu/info/wetlands/wetloss.html](http://h2osparc.wq.ncsu.edu/info/wetlands/wetloss.html).

*Wetlands and Agriculture: Private Interests and Public Benefits,* Ralph E. Heimlich et al. USDA-ERS Report No. 765. Available on-line at [www.ers.usda.gov/publications/aer765](http://www.ers.usda.gov/publications/aer765).