

# *1. The Importance of Protecting Wetlands*



Avoidance and minimization of impacts to wetlands should be an integral part of designing and building any project that is located in or near a wetland. Before designing a permissible project, it is important for an applicant to understand the functions and values of wetlands that need to be protected. These functions and values are described in the Rules. The list includes: protection from flooding, groundwater protection, valuable wildlife habitat, recreation value, and water quality maintenance. Once an applicant understands how valuable and important wetlands are in the landscape, it will be easier to understand why they must be protected. The following text elaborates on the five functions and values that are listed in the Rules.

## **1. Protection from Flooding**

One of the most important functions of freshwater wetlands is their capacity to control flooding, thereby protecting people and property. Wetlands help control floodwaters by storing excess water during heavy periods of rain and snowmelt. During storm events and spring thaws, vegetated wetlands receive runoff from upland areas and water that overflows from rivers and streams, and lakes and ponds. Freshwater wetland trees, shrubs, roots, soil, and other vegetation temporarily hold and store excess water, sometimes for long periods, until it can be slowly released into nearby rivers and streams. While this water is being stored in wetlands, it reduces the risk of flooding nearby houses, roads, parking lots, etc., and it also lessens the threat of downstream flooding.

When heavy rain occurs in a watershed where vegetated wetlands have been altered or destroyed, the rainwater flows more quickly over the land and causes quick rises and falls in river and stream levels, which in turn can cause flash flooding in the vicinity or downstream. In a watershed with healthy, functioning wetlands, rainwater may be temporarily stored in wetlands, thus moderating the river and stream levels and both delaying and reducing the flood peak of the storm.

Without question, it is easier and less expensive to protect existing wetlands and their natural flood control function, than to pay for flood damages or to build storm water and flood control structures to manage the water. If wetlands are filled, their ability to store floodwater is diminished, thus putting lives and properties at risk.

## **2. Groundwater Protection**

The connection between wetlands and the groundwater system is especially important in Rhode Island where many people rely on groundwater for their source of drinking water, for agriculture, and for other uses. Depending upon their position in the watershed and the underlying geology, some wetlands may feed or recharge the groundwater system, while other wetlands may be areas where groundwater discharges to the surface. Both wetland-groundwater relationships are important.

In the first situation, wetlands convey some of the runoff and floodwaters that they have temporarily stored into the ground, thereby contributing water to the aquifer system below.

The aquifer may be a public or private water supply source. The second more common situation is where groundwater discharges to the surface of wetlands, which may help to cool surface waters, maintain habitat, and maintain river and stream levels.

As groundwater aquifers are developed for water supplies, their impacts to wetlands must be carefully considered. If an aquifer is located beneath a wetland, then pumping it may result in induced groundwater recharge from the wetland, thus resulting in potential long-term changes to the wetland's natural hydrology. If the wetland becomes polluted, then the groundwater that is pumped from the aquifer for drinking water may also become polluted. Therefore, protecting wetlands will in turn help protect our groundwater and our drinking water.

### **3. Valuable Wildlife Habitat**

One of the best-known functions of wetlands is the habitat they provide for a wide variety of wildlife. Many mammals, birds, reptiles, and amphibians depend on wetlands for feeding, nesting, escape cover, migration stopovers, and wintering habitat; while other wildlife do not require wetlands to meet their life needs, they do utilize them. Certain specially adapted plants also grow and flourish in wetlands. Even small wetlands that appear dry much of the year are crucial to the survival of certain species, and in urban areas they may be the only remaining habitat for wildlife.

More than one-third of all threatened and endangered wildlife species in the United States live only in wetlands, and nearly 50% of all threatened or endangered species use wetlands at some point in their lives. Many rare plants and animals of Rhode Island also depend on wetlands for survival.

### **4. Recreational Value**

Wetlands support a wide range of active and passive recreational activities, including hunting, hiking, photography, bird watching, research, and nature study. Other open water activities include swimming, fishing, and boating. Some of these activities may not be entirely dependent on the presence of water, but they are often enhanced by and focused around wetlands.

The quality of a recreational activity depends, to a great extent, on the health of the wetland system. For example, the fish in a pond will only be healthy if the streams and groundwater that feed the pond are healthy. Fish from ponds and streams that are contaminated with urban or industrial runoff may no longer be safe to eat. Therefore, protecting wetlands helps to provide the consumer with safe and healthy fish.

Wetlands are also important because they provide attractive open space in increasingly urbanized areas. In addition, many wetlands contain unusual physical features or have a particular historical significance.

### **5. Water Quality Maintenance**

Wetland soils and plants have the capacity to naturally treat surface water and groundwater by filtering nutrients, absorbing pollutants, removing sediment, up taking pollutants and by other natural chemical and physical processes. This natural treatment capacity is limited, but it does help to protect and improve groundwater quality and the water quality in our rivers and streams. It is limited because if wetlands are used solely for this treatment purpose (and therefore become overburdened), they can become degraded themselves, thus eliminating or impacting their other benefits to people and to wildlife.

In addition to the functions and values described above, wetlands provide other important contributions, such as the production of commercially viable products. They also serve as sites for

scientific research and education, and they are scenic areas and provide open space, which are also important reasons to protect wetlands. Understanding all of the services freshwater wetlands provide should help readers understand the benefits of avoiding and minimizing wetland impacts and the costs of not doing so.

## Understanding Impacts to Wetlands

Many applicants may find it helpful to understand some of the direct results of altering freshwater wetlands. The following are a few examples:

- If wetlands are filled in order to build a new development the entire area may be at risk for increased flooding. Plus there will most likely be a loss of open space to be enjoyed by the community, and wildlife populations may decrease due to displacement and increased noise, light and other human disturbance.
- If wetlands are excavated or drained there is a loss of wildlife habitat for food, nesting, and shelter. Plus an area may be much less scenic or have degraded aesthetic value, and the opportunity for outdoor recreation, such as canoeing, birdwatching or fishing may disappear.
- If upland vegetation adjacent to a river or stream is removed, erosion and sedimentation of the riverbank may occur. Polluted stormwater will then have no barrier to flowing directly into the river or stream, thus causing a decline in water quality.
- If stormwater runoff is channeled directly into a wetland, the pollution and sediment from the stormwater may cause a change in the water chemistry. As a result, plants and animals may no longer be able to survive in the area, especially if they are already threatened or rare.

All of these types of alterations can, over time, result in cumulative impacts to the degree that entire watersheds are affected and the benefits that natural wetlands can provide are greatly diminished. Thus, it is important to remember that even on small projects, you must avoid and minimize impacts. A handful of small alterations or changes to a wetland can add up to a significant change in a wetland's functions and values.

When considering a parcel of land for development that contains wetlands, it is advisable to begin by planning ways to avoid the wetland areas entirely. This may be simple if the wetland is only on one side of the property or if an upland portion of the property can be easily accessed. It might be necessary to consider designs for a house, building, or trail so as to avoid the wetland, even if they are different from the original project design. After avoiding the existing wetlands, the next step is to minimize any remaining impacts from project development. These steps will help to preserve important wetland functions and values. The same is true for a redevelopment or a land reuse project. Such projects will present various challenges, but also many opportunities to avoid and minimize, as well as to restore.

## Wetland Alteration Examples

- Cutting and clearing of vegetation
- Filling in wetland or grading of soils
- Excavation of wetland soils
- Addition of sediments to wetland from runoff
- Ditching in to lower water levels
- Damming or impounding surface water
- Diking to keep water out
- Diversion of rivers or streams
- Removal of surface water by pumping
- Discharge of stormwater or wastewater into wetlands
- Diversion of groundwater flow or removal of groundwater by pumping
- Reduction of groundwater recharge in wetland
- Cutting and clearing of upland vegetation adjacent to wetlands
- Filling in upland adjacent to wetlands
- Excavation of soils or grading in upland adjacent to wetland

## **Project Development: Avoidance and Minimization**

Every project submitted by a property owner is evaluated by DEM to see whether all steps have been taken to avoid alterations in or near wetlands. The following questions may help determine whether or not wetland impacts have been sufficiently avoided and minimized:

- ❓ Are there other properties available on which to build that do not contain wetlands? (This is a good first question to ask before buying property with wetlands)
- ❓ Does the project have to be located where it is, or could it be located elsewhere on the property farther away from the wetlands?
- ❓ Are there alternative layouts, designs or technologies that would avoid detrimental wetland impacts and still meet the project purpose by building up instead of out?
- ❓ Are there any other project alternatives that would not adversely impact health, safety or the environment?
- ❓ Could an easement be obtained from a neighbor for a driveway or to access upland that would allow the project to be built further away from the wetlands?
- ❓ Could one obtain a zoning variance?

**The following are key avoidance and minimization techniques common to many project types. These techniques are elaborated on and expanded in each of the subsequent sections:**

- Avoid filling wetlands or removing trees or other vegetation from within wetlands.
- Keep disturbed areas to a minimum, and preserve natural areas around wetlands as much as possible.
- Design with the grade of the land to avoid earthwork as much as possible and to maintain existing drainage characteristics.
- For large projects consider a design that limits road and utility crossings.
- Locate unavoidable crossings at the narrowest section of the wetland, or utilize existing crossings, such as from a farm road or cart path, for access to upland.
- Consider designing a shared driveway to limit the number of wetland crossings in a subdivision or neighborhood.
- Minimize surface area of roads, parking, paving or other artificial surfaces.
- Utilize boulders, gabions, or retaining walls where appropriate to reduce the amount of filling needed for slopes.
- Use pervious materials, such as crushed stone or gravel, for driveways and roadways.
- Use light shields to direct artificial lighting away from wetlands.
- Avoid water withdrawal from wetlands.
- Install dense plantings of trees and shrubs within the limits of work to help buffer the wetland from noise, lighting and other disturbances post construction.