

# 2.4 Wetlands Protection

## BACKGROUND AND PURPOSE

This chapter provides municipalities with a model ordinance designed to protect wetlands and adjacent upland habitat and the functions and values they provide.

Historically, wetlands were viewed as wastelands, too wet to plant or build on. Many wetlands were either drained or used as dumping grounds. Now it is understood that wetlands provide important environmental benefits.

Wetlands and adjacent uplands provide essential habitat for wildlife, including food, cover, and travel if connected to other habitat. Protection of small wetlands and adjacent uplands is often important for achieving this connectivity. Wetlands support almost two-thirds of New Hampshire's wildlife in greatest need of conservation (N.H. Fish and Game Department, 2005). Some small seasonal surface waters known as vernal pools – temporarily flooded depressions that lack breeding fish populations – are the breeding habitat for amphibian species that live in upland areas most of the year. Larger wildlife, such as moose, depend on wetlands for their food source as well. In New Hampshire, hunting generates \$71 million in revenue and provides more than 1,400 jobs (N.H. Fish and Game, 2005).

Wetlands protect water quality in our lakes and streams. They remove excess nitrogen and trap sediment and associated contaminants, such as metals and phosphorus. Wetlands located along waterways and shorelines buffer the natural wind and waves.

Wetlands help to reduce floods by acting like a sponge, slowing runoff from upland areas and releasing water slowly, reducing peak flood flows downstream. Conversely, wetlands help keep streams flowing in dry periods, because groundwater is often discharged into wetlands, and they continue to release the water even without additional rain. This is important for adequate water supply and wildlife habitat.

Estuarine areas and coastal marshes, where salt water and fresh water mix, are among the most ecologically-productive areas in the world. Tidal wetlands are nurseries for finfish and shellfish. In tidal areas, retention of sediment is especially important to minimize the deposition of fine sand or silt in shellfish beds. Tidal wetlands serve as spawning and nursery areas for fish, including those that are commercially harvested.

### RELATED TOOLS:

- Stormwater Management
- Habitat Protection
- Erosion and Sediment Control During Construction
- Shoreland Protection: The Importance of Riparian Buffers
- Flood Hazard Area Zoning

Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society. Values are benefits that derive from either one or more functions and the physical characteristics associated with a wetland.

Buffer areas, the upland areas adjacent to wetlands, are essential to maintenance and protection of wetland functions and values. These buffer areas protect wetlands from degradation by:

1. Stabilizing soil and preventing erosion.
2. Filtering suspended solids, nutrients, and harmful or toxic substances.
3. Moderating impacts of stormwater runoff.
4. Moderating system microclimate.
5. Providing habitat and protecting wetland wildlife habitat from adverse impacts.
6. Maintaining and enhancing habitat diversity and/or integrity.
7. Supporting and protecting wetland plant and animal species and biotic communities.
8. Reducing disturbances to wetland resources caused by intrusion of humans and domestic animals.

The size of buffers needed varies by the function and the site-specific conditions.

The ability of vegetated wetland buffers to provide water quality protection increases with the size of the buffer. At 100 feet, most of the contaminants and nutrients have been removed (Chase *et al*, 1997). Protection of buffers will reduce wetland impacts by moderating the effects of stormwater runoff, including stabilizing soil to prevent erosion; filtering suspended solids, nutrients, and harmful or toxic substances; and moderating water level fluctuations.

However, wetland buffers to support wildlife may need to be much larger. Buffers also provide essential habitat for wetland-associated species for use in feeding, roosting, breeding and rearing of young, and cover for safety, mobility, and thermal protection.

Finally, buffers reduce the adverse impacts of human disturbance on wetland habitats by blocking noise and glare; reducing sedimentation and nutrient input; reducing direct human disturbance from dumped debris, cut vegetation, and trampling; and providing visual separation.

State jurisdiction of wetlands is found in RSA 482-A and NH Department of Environmental Services administrative rules Env-Wt 100-800. Almost all activities that disturb the soils in a jurisdictional area, regardless of size or scale, in or on the banks of a surface water body or in a wetland require a permit from the state. Projects are classified according to their potential environmental impact – as minimum impact, minor impact, and major impact. There are a variety of ways by which projects are classified, including area of impact. Wetlands impacts less than 3,000 square feet may be minimum impact, from 3,000 to 20,000 square feet may be minor impact; and impacts greater than 20,000 square feet, any activity in or within 100 feet of prime wetlands, tidal wetlands, sand dunes, bogs, or natural exemplary communities, or disturbance of more than 200 feet of shoreline, are classified as major impacts. The classification of impact determines the amount of information and environmental analysis required and the commensurate review of an application.

The federal government also has jurisdiction over wetlands under Section 404 of the Clean Water Act. Section 404 review is administered by the Army Corps of Engineers, which coordinates review with the federal resource agencies – National Oceanic and Atmospheric Administration - National Marine Fisheries, and the US Fish and Wildlife Service. The Army Corps of Engineers has issued a Programmatic General Permit in New Hampshire, which means that most state wetlands permits are concurrently approved by the Army Corps of Engineers. This provides for a more streamlined process and less duplication of effort. The new New Hampshire Programmatic General Permit was reissued on June 28, 2007. A copy may be downloaded from the Army Corps of Engineers' website.

Protection of wetlands and adjacent uplands on a local level can provide additional oversight for proposed activities in wetlands and establish buffers that maintain the functions and values of wetlands. Local regulation of wetlands can:

- Review potential impacts to smaller wetlands more thoroughly.
- Prevent the cumulative impacts associated with a collection of small projects.
- Reflect the interests of the community, e.g. to prevent costly water supply impacts or increased flooding.
- Protect the functions and values of the wetland ecosystem by protecting buffers around the wetlands.
- Provide local inspection and enforcement.

## APPROPRIATE CIRCUMSTANCES AND CONTEXT FOR USE

Wetlands occur in every community in New Hampshire. Communities that want more protection for wetlands than is provided through state and federal regulations, including protection of wetland buffers, need to incorporate local wetland protection requirements into the zoning ordinance. Protection of wetlands and adjacent uplands is best achieved with an overlay district so that the underlying zoning is still in effect and these resources have an additional layer of protection.

Zoning ordinance provisions are just one piece of what is necessary to protect the functions and values associated with wetland ecosystems. Vegetated buffers may not remove all pollutants and can not address large volumes of stormwater runoff. In fact, large peak flows may result in sediments and other pollutants that were previously trapped in the vegetated buffer to be carried into the wetland. For the wetland ecosystem to truly be protected from pollutants and extreme fluctuations in water levels, communities also need to address the issue of stormwater management.

Communities wishing to protect the functions and values of their wetlands may want to consider conducting an inventory of important local natural resources and habitats. A natural resources inventory may identify some wetland areas that are particularly valuable for ecosystem services, protection of water supplies, or recreational opportunities. RSA 482-A:15 provides an option for municipalities to protect their high value, or prime, wetlands. By conducting an assessment of the functions and values of their wetlands, municipalities can designate prime wetlands for a higher level of protection, increasing the likelihood that there will be no significant net loss of wetlands values.

Communities may designate prime wetlands based on their importance for 10 of the following 14 functions and values:

- Ecological integrity
- Wildlife habitat
- Finfish habitat
- Educational potential
- Visual/aesthetic quality
- Water-based recreation
- Flood control potential
- Groundwater use potential
- Sediment trapping
- Nutrient attenuation
- Shoreline anchoring and dissipation of erosive forces
- Urban quality of life potential
- Historical site potential
- Noteworthiness

Stormwater management and erosion and sedimentation control regulations ensure that stormwater runoff from roads and other developed areas is minimized and also receives some treatment before reaching areas such as wetlands.

## LEGAL BASIS AND CONSIDERATIONS FOR NEW HAMPSHIRE

RSA 674:21 II, Innovative Land Use, grants administrative authority to a “person or board as the ordinance may designate” to review proposals and issue the conditional use permit. The model ordinance in this chapter has designated the conservation commission as the responsible administrative entity. Each municipality should designate the entity best suited to review projects seeking wetlands conditional use permits. There may be instances involving site plan or subdivision review where the process will benefit from concurrent review with the planning board. However, in most cases requiring site plan or subdivision review, the conditional use permit should be required prior to submission of the site plan or subdivision application.

### ENABLING STATUTES

NH RSA 674:16, Grant of Power, provides the foundation of a municipality’s right to zone. RSA 674:16 clarifies that the power to adopt a zoning ordinance “...expressly includes the power to adopt innovative land use controls which may include, but which are not limited to, the methods contained in RSA 674:21.” Among the techniques listed in 674:21 is “environmental characteristics zoning.”

### LOCAL JURISDICTION

Municipal boards occasionally hear arguments that state regulation of an activity precludes additional local review. This argument is false. Local regulations are preempted by state law only if they expressly contradict a state law, or run contrary to the legislative intent (Beliveau, 2006). Beliveau cites support for local wetland regulations from several recent New Hampshire cases: “[absent a clear manifestation of legislative intent to preempt a field, a municipality may enact an ordinance that neither conflicts with state legislation nor is itself unreasonable,” *Town of Hooksett v. Baines*, 148 N.H. 625, 627 (2002); and, “[A] municipality is not estopped from creating more restrictive rules for wetlands issues than those required by the [wetlands] board,” *Cherry v. Town of Hampton Falls*, 150 N.H. 720 (2004).

### LOCAL CONSIDERATIONS

It is important for planning boards and conservation commissions to carefully consider the municipality’s ability to implement and enforce an ordinance prior to proposing a particular approach.

A good wetlands map is important for local wetland regulations even when using a wetlands definition as the basis of the actual wetlands zoning district. National Wetlands Inventory maps and soils maps are useful indicators of the locations of larger wetlands in the community. These will help voters get a feel for how much of the community will be affected by the proposed ordinance at town meeting time, and will help the community implement the regulations later. Ideally a community with local wetland regulations should aim to conduct a local wetlands inventory. A digitized local inventory could be overlain with digital parcel boundaries and provide the basis for a wetlands overlay district map, reducing the need for mapping at the time of each permit application and so making it easier for both the landowner and regulator.

National Wetland Inventory maps do not show all wetlands. Short of field delineation, a combination of NWI maps and soils maps will best represent wetlands. For further information about wetlands inventories, see [www.des.nh.gov](http://www.des.nh.gov).

## EXAMPLES AND OUTCOMES

According to the 2007 survey by the NH Office of Energy and Planning (OEP), 111 New Hampshire communities currently regulate development in wetlands. The survey information posted on the OEP website showed that at least 62 of these communities also regulate development adjacent to the wetlands. The approach to the buffer area varies a great deal among communities. Some communities have incorporated the 100-foot buffer recommended in *Buffers for Wetlands and Surface Waters* (Chase *et al.*, 1997) as the effective distance for most water quality issues. Other communities regulate the activities in a buffer zone ranging from 25 feet to 125 feet to ensure that the functions and values of the wetland are protected. However, many communities, while requiring that buildings be set back 50 to 100 feet from the wetland, allow unregulated removal of vegetation and other potentially harmful activities in the buffer zone.

Lyme is an example of a community that has regulated activities adjacent to the wetland for many years. In a 100-foot buffer, only activities not involving structures or alteration of the land surface, such as forestry, agriculture, conservation and passive recreation, are permitted uses.

In Milford, while a buffer only 25 feet wide is protected around most wetlands, “peatlands” or bogs are protected with a buffer 100 feet wide.

Several communities, including Auburn, Bow, Rochester, Loudon and Windham, specifically address vernal pools in their zoning ordinances as well.

# Model Language and Guidance for Implementation

## WETLANDS CONSERVATION OVERLAY DISTRICT

### I. TITLE AND AUTHORITY

- A. Title: The title of this district shall be the Wetlands Conservation Overlay District.
- B. Authority: This ordinance is adopted under the authority granted pursuant to RSA 674:16, Grant of Power, and RSA 674:21, Innovative Land Use Controls.

### II. FINDINGS

The wetlands and buffers in the municipality of [\_\_\_\_\_] are a valuable natural resource requiring careful management to maintain their usefulness to public health, safety and welfare. The municipality of [\_\_\_\_\_] finds that wetlands and buffers:

- A. Prevent the destruction of, or significant changes to, those wetland areas, related water bodies and adjoining land which provide flood protection.
- B. Protect persons and property against the hazards of flood inundation by ensuring the continuation of the natural flow patterns of streams and other watercourses.
- C. Provide for nutrient attenuation and augmentation of stream flow during dry periods.
- D. Preserve and protect important wildlife habitat and maintain ecological balance.
- E. Prevent the expenditure of municipal funds for the purposes of providing and/or maintaining essential services and utilities which might be required as a result of abuse or inharmonious use of wetlands.
- F. Protect the wetlands, watercourses, surface and groundwater supplies and waterbodies of the town/city from degradation.
- G. Preserve and enhance those aesthetic values associated with the Wetlands Conservation Overlay District.

### III. PURPOSE

The purpose of the Wetlands Conservation Overlay District is to protect the public health, safety and general welfare by promoting the most appropriate use of land and the protection of wetland ecosystems and water quality in accordance with the goals and objectives of the master plan.

### IV. APPLICABILITY

All proposed development, removal of vegetation, and alteration of the land surface within the Wetlands Conservation Overlay District is subject to this ordinance.

Each community will need to review the definition of “development” contained in their zoning ordinance to ensure that the term, along with the removal of vegetation and alteration of the land surface, covers all activities that should be reviewed in the Wetlands Conservation Overlay District.

## V. BOUNDARIES

### A. The Wetlands Conservation Overlay District includes:

- Surface waters of the state.
- Wetlands of any size.
- Buffers 100 feet wide around bogs over 1,000 square feet, vernal pools over 500 square feet, wetlands of any size adjacent to open water, and all other wetlands over 40,000 square feet.

Some communities may want to limit the applicability of the ordinance to larger wetlands for administrative efficiency. Suggested thresholds are as follows:

- Wetlands of any size adjacent to surface water.
- Vernal pools over 500 square feet.
- Other wetlands over 1,000 square feet.

Be sure to review the DES Wetlands rules before proceeding with the ordinance. Wetland delineation (identification of wetland boundaries) requires a field-conducted evaluation of soils, hydrology and plants by a certified wetland scientist, unless exempted under New Hampshire law (RSA 310-A or RSA 482-A or administrative rules Env-Wt 100-800). Three indicators are used to identify wetlands:

1. The presence of water at or near the ground surface for part of the growing season.
2. The presence of hydric soils.
3. The predominance of plants that are adapted to living in saturated soils.

Current methodology required by DES Wetlands Bureau Rules, as of 2007, is the Wetlands Delineation Manual, (U.S. Army Corps of Engineers, January 1987).

### B. Wetlands constructed for stormwater treatment, agricultural use, waste treatment or other such purpose are exempt from the provisions of the Wetlands Conservation Overlay District.

### C. The Wetlands Conservation Overlay District Map, dated [\_\_\_\_], available at the (town/city office), is based on (reference National Wetlands Inventory map, hydric soils, or other source map) and provides a general indication of the location of the larger wetlands in the community.

Use the best available map as an indicator of wetlands. For some communities this will be the National Wetlands Inventory and soils maps together. The map should include a caveat that not all wetlands are shown.

### D. Boundary Disputes. When a boundary of the Wetlands Conservation Overlay District is disputed by either the conservation commission or an applicant, the conservation commission, at the applicant's expense, may engage an independent certified wetlands scientist to determine the location of the Wetland Conservation Overlay District limit on the properties affected. The delineation shall be consistent with DES Wetlands Bureau Rules, as amended. The completion of a New England District Wetland Delineation Datasheet (US Army Corps of Engineers, 2000) by the certified wetland scientist can provide the appropriate level of documentation to address questions about the delineation. The conservation commission shall make the final determination of the wetlands limit based on its consultant's report. The Wetlands Conservation Overlay District Map shall be amended to incorporate the results of any such studies.

## VI. DEFINITIONS

**Adjacent:** Bordering, contiguous, or neighboring. The term includes wetlands that directly connect to other waters of the United States, or that are in reasonable

proximity to these waters, but physically separated from them by man-made dikes or barriers, natural river berms, beach dunes, and similar obstructions.

**Bog:** A wetland distinguished by stunted evergreen trees and shrubs, peat deposits, poor drainage, and/or highly acidic soil or water conditions.

**Buffer:** The protected upland areas adjacent to wetlands and surface waters in the Wetlands Conservation Overlay District.

**Certified Wetland Scientist:** A person qualified to delineate wetland boundaries and prepare wetland maps who is certified by the State of New Hampshire Board of Natural Scientists, as defined by RSA 310-A:76, II-a.

**Development:** Any human-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, excavation or drilling activities.

**Hydric Soils:** Soils that are saturated or flooded during a sufficient portion of the growing season to develop anaerobic conditions in the upper soil layers.

**Prime Wetlands:** Those areas designated Prime Wetlands in accordance with RSA 482-A:15, and the N.H. Code of Administrative Rules Env-Wt 700.

**Vernal Pool:** A body of water, typically seasonal, that provides essential breeding habitat for certain amphibians and invertebrates, does not support viable fish population, and meets the criteria established by the New Hampshire Fish and Game Department, Nongame and Endangered Wildlife Program, *Identification and Documentation of Vernal Pools in New Hampshire*, rev 2004.

**Surface Waters of the State:** Pursuant to RSA 485-A:2.XIV, perennial and seasonal streams, lakes, ponds, and tidal waters within the jurisdiction of the state, including all streams, lakes, or ponds bordering on the state, marshes, water courses, and other bodies of water, natural or artificial.

**Wetland:** Pursuant to RSA 482-A:2.X, an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

## VII. PERMITTED USES

The uses listed below are presumed to be consistent with the protection of wetland functions and values when in accord with the following and so are allowed in the Wetlands Conservation Overlay District without a Conditional Use Permit. These uses will not:

- Require the erection or construction of any structure.
- Alter the natural surface configuration by re-contouring or grading of the land.
- Involve filling, dredging, or draining of the wetland.
- Change the flow of water.
- Result in the pollution of the wetlands, surface water, or groundwater.
- Involve substantial clearing of vegetation, except for the purposes of agriculture or forest management in accord with current best management practices.

Permitted uses include:

- A. Passive recreation such as hiking, fishing, hunting on foot, non-motorized boating.
- B. Wildlife or fisheries management.
- C. Scientific research and educational activities.
- D. Agriculture in the wetland buffer, consistent with best management practices published by the NH Department of Agriculture, Markets and Food.
- E. Forest management in the wetland buffer, consistent with best management practices published by the NH Department of Resources and Economic Development and UNH Cooperative Extension.

The building/zoning permit application form should be revised to ask the applicant if the proposed activity or structure is located in a wetland or buffer.

## VIII. PROHIBITED USES

The following uses may not be established or expanded within the Wetlands Conservation Overlay District:

- A. Structures, except as provided in section IX: Conditional Uses.
- B. Salt storage.
- C. Automobile junkyards.
- D. Solid or hazardous waste facilities.
- E. Use of fertilizer on lawns, except lime or wood ash.
- F. Bulk storage or handling of chemicals, petroleum products or hazardous materials.
- G. Sand and gravel excavations.
- H. Processing of excavated materials.
- I. Impervious surfaces, unless associated with a use approved as a Conditional Use.
- J. Activities which result in soil compaction such as parking vehicles or heavy equipment, unless associated with a use approved as a Conditional Use.
- K. Underground tanks.

## IX. CONDITIONAL USES

All activities in the Wetland Conservation Overlay District not listed in Section VII, Permitted Uses, above are presumed to impair the wetland functions and values unless proven otherwise by the applicant as provided below. The following uses may be granted a Conditional Use Permit by the conservation commission:

- A. Accessory structures in the wetland buffer associated with legally preexisting primary structures if it is demonstrated that no practicable alternative exists elsewhere on the lot.

- B. The construction, repair, or maintenance of streets, roads, and other access ways, including driveways, footpaths, bridges, and utility right of way easements including power lines and pipe lines, if essential to the productive use of land adjacent to the Wetlands Conservation Overlay District. These uses shall be located and constructed in such a way as to minimize any detrimental impact upon the wetlands and consistent with state recommended design standards (see Fish and Game Department 2008), and only if no viable alternative is available.
- C. Agricultural activities consistent with best management practices as published by the NH Department of Agriculture Markets and Food.
- D. Forestry activities consistent with best management practices as published by the NH Department of Resources and Economic Development and NH Cooperative Extension. As specified in Logging Operations (Env-Wt 304.05), all skid trails, truck roads and log landings shall be located 50 feet from streams or ponds and designed using appropriate erosion control devices. Stream and wetlands crossings shall be kept to a minimum in size and number.
- E. Water impoundments for the purpose of creating a waterbody for wildlife, fire safety, or recreational uses. Conditional Use Permits may be granted for impoundments for on-site detention of stormwater runoff in buffers only.
- F. Disposal of snow and ice collected from roadways and parking areas.
- G. Other uses that the applicant proves will not interfere with the wetlands functions and values, water quality or value as wildlife habitat, pursuant to Section II.

According to DES, snow dumps should be located in flat areas adjacent to flowing surface water, such as streams and rivers, in order for salt to be diluted while allowing for collection and proper disposal of solids. See the fact sheet at [www.des.nh.gov](http://www.des.nh.gov).

## X. NONCONFORMING USES

Expansion of a nonconforming use or structure may be allowed by the zoning board of adjustment in the wetland buffer provided that the encroachment upon the wetland is not increased and review by the conservation commission finds that any potential increased impact upon the wetland functions will be mitigated.

## XI. CONDITIONAL USE PERMIT

- A. Application for a Conditional Use Permit shall be made on forms supplied by the conservation commission and shall include a site plan containing the following information on one or more sheets at a scale of 1 inch = 100 feet or larger, and a report demonstrating compliance with the requirements listed below in Section XI.B:
  - 1. North arrow and date.
  - 2. Property lines.
  - 3. Locus map showing adjacent wetlands and other significant hydrological features.
  - 4. Names and addresses of abutting property owners and holders of conservation restrictions and easements.
  - 5. Wetland limit and wetland buffer.

6. Soil types.
  7. Vegetation types.
  8. Topographic contours at no greater than 5 foot intervals.
  9. Surface drainage patterns, intermittent and year-round.
  10. Existing and proposed development, removal of vegetation, and alteration of the land surface.
  11. Computation of the area to be impacted, in square feet of surface area and cubic yards of cut and fill.
  12. Stormwater management proposed during and after construction.
- B. The conservation commission shall consider all relevant facts and circumstances in making its decision on any application for a permit and shall make findings that the project is both consistent with the purposes of this ordinance and minimizes impacts to the wetland and buffers, including but not limited to the following:
1. The proposed activity minimizes the degradation to, or loss of, wetlands and wetland buffers, and compensates for any adverse impact to the functions and values of wetlands and wetland buffers, including but not limited to the capacity of the wetland to:
    - a. Support fish and wildlife
    - b. Prevent flooding
    - c. Supply and protect surface and ground waters
    - d. Control sediment
    - e. Control pollution
    - f. Support wetland vegetation
    - g. Promote public health and safety
    - h. Moderate fluctuations in surface water levels.
  2. The proposed activity will have no negative environmental impact to abutting or downstream property and/or hydrologically connected water and/or wetland resources, including:
    - a. Erosion
    - b. Siltation
    - c. Turbidity
    - d. Loss of fish and wildlife
    - e. Loss of unique habitat having demonstrable natural, scientific, or educational value
    - f. Loss or decrease of beneficial aquatic organisms and wetland plants.
    - g. Dangers of flooding and pollution.
    - h. Destruction of the economic, aesthetic, recreational and other public and private uses and values of the wetlands to the community.

3. The proposed activity or use cannot practicably be located otherwise on the site to eliminate or reduce the impact to the wetland or its buffer.
  4. The proposed activity utilizes applicable best management practices.
  5. Federal and/or state permit(s) have been received for the proposed activity in accordance with N.H. Administrative Rules Env-Wt 100-800 and the Federal Clean Water Act Section 404 Permit.
  6. Where applicable, proof of compliance with all other state and/or federal regulations has been received.
- C. The conservation commission, in acting on an application for a conditional use permit in the Wetlands Conservation Overlay District, may attach conditions to its approval including but not limited to requirements for more extensive buffers, additional plantings in areas to be revegetated, performance guarantees, and a reduction in proposed impervious surfaces.
- D. Prior to making a decision, the conservation commission shall afford the planning board an opportunity to provide comment, and shall consider any such comments provided.

## XII. IDENTIFICATION OF BUFFER

The entire length of the upland limit of the wetland buffer shall be marked with highly visible construction tape prior to, and maintained for the full duration of, any construction-related activities. The applicant may also be required to place a permanent monument (e.g., iron pin, granite bound) at all points of the lot lines which intersect with the upland limit of the Wetlands Conservation Overlay District prior to such activities. These monuments shall be shown on the site plan submitted with the application. The applicant may also be required to affix tags to trees or other durable objects (e.g., 4" x 4" wood posts) at 50 foot intervals along the upland boundary of the Wetlands Conservation Overlay District, and maintain said tags as needed to provide evidence of the upland side buffer boundary. Tags shall be obtained from the municipality.

Figure 2.4.1 Examples of Buffer Identification Tags



## REFERENCES

- Ammann, A.P. and A. Lindley Stone. 1991. *Method for the Comparative Evaluation of Nontidal Wetlands in New Hampshire*. NHDES-WRD-1991-3. New Hampshire Department of Environmental Services.
- Beliveau, Mark E. 2006. "Wetlands Regulation and the Authority of Local Government" in New Hampshire Local Government Center 2006 Municipal Law Lecture Series, Lecture 2: "Environmental Permitting: The Role of Local Officials."
- Beliveau, Mark E. and G. Dana Bisbee. 2003. New Hampshire Municipal Association, 2003 Municipal Law Lecture Series, Lecture 1, "Water, Wetlands and the Role of Local Government."
- Boyd, Lynn. July 2001. *Buffer Zones and Beyond: Wildlife Use of Wetland Buffer Zones and Their Protection under the Massachusetts Wetlands Protection Act*. Wetland Conservation Professional Program, Department of Natural Resources Conservation, University of Massachusetts.  
[www.umass.edu/nrec/onlinedocs.html](http://www.umass.edu/nrec/onlinedocs.html).
- Chase, V., L. Deming, and F. Latawiec. Nov. 1995, Rev. May 1997. *Buffers for Wetlands and Surface Waters - A Guidebook for New Hampshire Municipalities*. Audubon Society of New Hampshire and NH Office of State Planning.
- Connecticut River Joint Commissions. November 2000. *Riparian Buffers for the Connecticut River Watershed*. [www.crjc.org/riparianbuffers.htm](http://www.crjc.org/riparianbuffers.htm)
- Kanter, J., R. Suomala, E. Snyder, et al. 2001. *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservations Groups*. Nongame and Endangered Wildlife Program of the New Hampshire Fish and Game Department.
- New England Interstate Water Pollution Control Commission. 2004. *Field Guide to the Identification of Hydric Soils in New England*, v. 3 and Supplement).
- New Hampshire Audubon Society. 1993. *Method for the Evaluation and Inventory of Vegetated Tidal Marshes in New Hampshire (Coastal Method)*.
- New Hampshire Department of Environmental Services. January 2004. *Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials*.
- New Hampshire Department of Environmental Services. Code of Administrative Rules. Chapters Env-Wt 100 through Env-Wt 800.
- New Hampshire Department of Resources and Economic Development and the Society for the Protection of New Hampshire Forests. 1997. *Good Forestry in the Granite State: Recommended Voluntary Forest Management Practices for New Hampshire*.
- New Hampshire Fish and Game Department. September 2008. *New Hampshire Stream Crossing Guidelines*.
- New Hampshire Fish and Game Department. 2005. *Wildlife Action Plan*.  
[www.wildlife.state.nh.us/Wildlife/wildlife\\_plan.htm](http://www.wildlife.state.nh.us/Wildlife/wildlife_plan.htm).
- New Hampshire Fish and Game Department. 2004. *Identification and Documentation of Vernal Pools in New Hampshire*. Michael Marchand, ed; 2nd edition.

- New Hampshire Local Government Center. *Look before You Leap: Understanding Conditional Use Permits*. [www.nhlgc.org/LGCWebSite/InfoForOfficials/legalqamasterpage.asp?offset=10&LegalQAID=41](http://www.nhlgc.org/LGCWebSite/InfoForOfficials/legalqamasterpage.asp?offset=10&LegalQAID=41).
- New Hampshire Natural Heritage Bureau. July 2007. *Rare Plants, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns*, (updated once or twice/year). [www.nhnaturalheritage.org](http://www.nhnaturalheritage.org).
- NWI Technical Report. 21 pp. [http://des.nh.gov/wetlands/pdf/nh\\_wetlands\\_and\\_waters\\_report.pdf](http://des.nh.gov/wetlands/pdf/nh_wetlands_and_waters_report.pdf).
- Pedevillo, C. *Habitat Values of New England Wetlands*. U.S. Fish and Wildlife Service in cooperation with the U.S. Army Corps of Engineers, Concord, NH, 1995.
- Sperduto, D. D. and W.F. Nichols. 2004. NH Department of Resources and Economic Development, Natural Heritage Bureau. *Natural Communities of New Hampshire*. [www.dred.state.nh.us/divisions/forestandlands/bureaus/naturalheritage/documents/Natural\\_Communities2ndweb.pdf](http://www.dred.state.nh.us/divisions/forestandlands/bureaus/naturalheritage/documents/Natural_Communities2ndweb.pdf).
- Tiner, R.W. 2007. *New Hampshire Wetlands and Waters: Results of the National Wetlands Inventory*. U.S. Fish and Wildlife Service, Northeast Region, Hadley, Mass.
- UNH Cooperative Extension. 2005. *Best Management Practices for Forestry: Protecting New Hampshire's Water Quality*.
- U.S. Army Corps of Engineers. January 1987. *Wetlands Delineation Manual*, Technical Report Y-87-01. [www.nae.usace.army.mil/reg/1987%20Wetland%20Delineation%20Manual.pdf](http://www.nae.usace.army.mil/reg/1987%20Wetland%20Delineation%20Manual.pdf).
- U.S. Army Corps of Engineers. September 1999. *Highway Methodology Workbook Supplement*. Wetland Functions and Values: *A Descriptive Approach*. NAEPP-360-1-30a. [www.nae.usace.army.mil/reg/hwsplmnt.pdf](http://www.nae.usace.army.mil/reg/hwsplmnt.pdf).
- U.S. Army Corps of Engineers, July 1, 2000. *New England District Wetland Delineation Datasheet and Supplemental Information*. [www.nae.usace.army.mil/reg/datasht.pdf](http://www.nae.usace.army.mil/reg/datasht.pdf).
- U.S. Army Corps of Engineers, NH Programmatic General Permit. Issued June 28, 2007. [www.nae.usace.army.mil/reg](http://www.nae.usace.army.mil/reg).