

SHORELAND PROTECTION: THE IMPORTANCE OF RIPARIAN BUFFERS

- Draft Chapter From: *Innovative Land Use Planning Techniques* -

Related Tools in Innovative Land Use Planning Techniques: Habitat Protection, Stormwater Management, Best Management Practices, Performance Standards, Environmental Characteristics Zoning, and Transfer Development Rights

Background & Purpose

The simplest and most effective way to protect streams, rivers, lakes and estuaries is to leave an area of undisturbed native vegetation adjacent to the water body. These undisturbed areas act as buffers by performing functions that protect water quality and enhance wildlife habitat. Preserving and restoring riparian buffers is essential to surface water quality protection.

There are a number of important guides, technical reports and scientific bulletins available to help New Hampshire municipalities better understand the importance of shoreland protection and the value of riparian buffers (see Bibliography for references). Two of the key resources for municipal planners are *Buffers for Wetlands and Surface Waters: A Guidebook for New Hampshire Municipalities* (Chase, et.al. 1997) and *Riparian Conservation: A Professional's Practical Guide to Financial Assistance and Program Support* (NH State Conservation Committee 2001).

Surface waters can be broadly classified as either lakes and ponds or rivers and streams. Streams are typically classified according to their *order* (see the definition of *Stream Order in Glossary*). In general, streams of higher order are larger than those of lower order. Rivers are examples of higher order streams. The size of a stream is one parameter that can be used to determine the amount of protection or buffer size that is desired for the water body.

In New Hampshire, municipalities currently have four options to regulate development for shoreland and riparian purposes:

Option 1: They may rely solely on the state's Comprehensive Shoreland Protection Act (CSPA), RSA 483-B, to protect the specific types of surface water bodies that fall under the jurisdiction of the CSPA.

Option 2: They may elect to adopt regulations that extend protection to the streams and surface water bodies that are not covered by the CSPA.

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Option 3: The municipality may adopt more stringent regulations than the minimum standards of the CSPA as provided for under RSA 483-B:8.

Option 4: The municipality may elect to develop separate stream corridor (watershed) regulations to protect the riparian buffers along first, second and third order streams and rivers within the community leaving the CSPA or a more stringent local shoreland ordinance to regulate the lakes, ponds, and higher order streams and rivers within the community.¹

Four primary resources were used to develop the ordinance of this chapter: the three-zone riparian buffer system developed by the Center for Watershed Protection; the Standards of the CSPA where those standards are most effective in protecting shorelands; the recommendations recently proposed by the senate Commission to Review the Effectiveness of the CSPA as they relate to this ordinance; and the DES Model Rule for the Protection of Water Supply Watersheds.

The model ordinance is designed to implement Option 3 above. It includes a provision to protect lower order streams and expands upon the buffers established by the CSPA. The ordinance contains three basic components: (1) a shoreland protection overlay district and zoning map; (2) shoreland protection district standards; and (3) riparian buffer standards. It is drafted as a complete zoning ordinance amendment.

Buffers for wetlands, fire and farm ponds, beaver impoundments, and coastal shorelands are excluded from the model ordinance.

For the purposes of this chapter, the terms “shoreland” and “riparian” shall be used interchangeably to refer to anything connected or immediately adjacent to the shoreline or bank of a stream, river, pond, lake, bay, estuary or other similar body of water. The term “riparian buffer” shall refer to the naturally vegetated shoreline, floodplain or upland forest adjacent to a surface water body.

Appropriate Circumstances and Context for Use

The Function and Configuration of Buffers

There are many types and sizes of riparian buffers. Within any given watershed, riparian buffers can be strips of grassy land leading to the water’s edge, thickly forested upland areas or floodplain areas that provide a transition zone between development areas and adjacent surface waters. Typically, these areas are managed to reduce the impacts of

¹ If a municipality desires to pursue this option, the following applicable provisions from this Model Ordinance should be considered: I, II, III, IV, V, VI, VII a, b, d.3, e, g, VIII, XI, and X.

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adjacent land use and to protect water quality by providing a buffer between upland development and the adjoining surface waters.

Most riparian buffers in New Hampshire consist predominately of forest vegetation. When left undisturbed and intact, these natural forest systems help to maintain clean water and healthy aquatic wildlife. Specifically, they serve to:

- Stabilize stream banks and shorelands with healthy root systems.
- Moderate the impact of heavy rains.
- Act as a natural filter, capturing sediment and pollutants from runoff.
- Protect people and property from flood damage by slowing and storing flood waters.
- Shade the shoreline and help to lower water temperatures. Cooler water holds more oxygen which is essential to aquatic animal species.
- Provide the organic matter that helps give soil the structural ability to hold oxygen and moisture. The duff layer (downed leaves, small twigs, and dead herbaceous vegetation) also moderates the impact of heavy rain, holds moisture, and can act as a natural mulch to prevent weed species.
- Increase property values by improving the appearance, beauty and aesthetics of the shoreland.
- Provide wildlife habitat on the shore with tree canopy, snags, and downed woody debris.
- Provide organic matter and woody material that falls into the water. The biomass that falls naturally into the water serves as food and habitat for the aquatic life in the water body.

The Center for Watershed Protection (CWP) has developed an effective three zone vegetated buffer model. The principles from that model have been adopted for the buffer strategy reflected in this model ordinance (see Figure 1). The CWP model consists of an inner zone (closest to the water's edge), a middle zone, and outer zone. The inner zone most closely matches the waterfront buffer proposed as an amendment to the CSPA. The middle and outer zones closely match the woodland buffer standards of the CSPA.

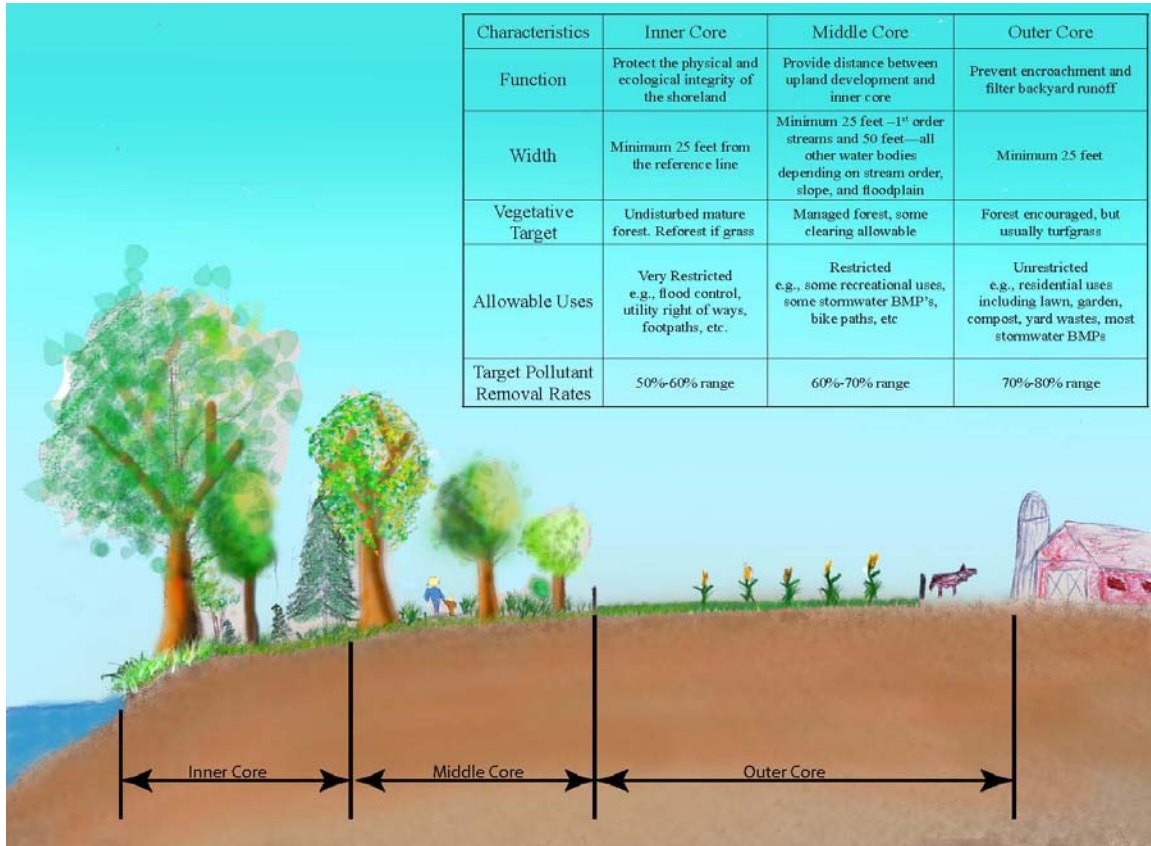


Figure 1- The Three Cores of the Natural Riparian Buffer

Inner Core: Extends a minimum of 25 feet from the water's edge for 1st and 2nd order streams (about the distance of one to two mature trees) and 50 feet for lakes, ponds and 3rd and 4th order streams. The inner core serves to protect the physical and ecological integrity of the adjacent water ecosystem. A mature riparian forest is the desired vegetation because it provides multiple canopy layers, interwoven root systems, shade, leaf litter, woody debris, and erosion protection. Only limited tree cutting and very restricted uses such as access paths and utility rights of way should be allowed. No land clearing or impervious surfaces (except an access path) should be considered within this zone.

Middle Core: Extends beyond the inner core to the beginning of the outer core, a minimum of 25 feet for 1st and 2nd order streams and a minimum of 50 feet for all other water bodies. The exact size of this zone will depend on stream order and slope.

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This zone is mainly composed of managed forest with some clearing allowed. This zone protects adjacent water quality and offers wildlife habitat. Fifty percent of this area can be allowed for structures, recreational use, stormwater best management practices, and tree removal. The other 50 percent of this zone should remain in an undisturbed state.

Outer Core: extends a minimum 25 feet out from the middle core for 1st and 2nd order streams and 50 feet for lakes, ponds and all 3rd and 4th order streams. This zone is mainly composed of forest or turf and typically contains the yard, garden, or woods between a residential dwelling and the rest of the buffer. This zone traps sediment and consists of play areas, gardens, compost piles, and other common residential activities.

While many factors including slope, soil type, adjacent land use (including amount of impervious cover), floodplain, vegetation type, and watershed condition all influence buffer width, in most cases, the most commonly prescribed minimum buffer widths for use in water quality and habitat protection are 35 to 250 feet (Tjaden and Weber). Buffers of less than 35 feet have not been found to sustain long-term protection of aquatic communities.

A minimum 100-foot buffer width is recommended in *Buffers for Wetlands and Surface Waters: A Guidebook for New Hampshire Communities*, as a standard width for all surface waters and wetlands in New Hampshire (Chase, Deming, and Latawiec, 1997).

Even for narrow creeks or intermittent streams that run through residential neighborhoods or commercial developments, riparian buffers are important for sediment control and aquatic integrity. Protection of these smaller creeks and streams is particularly important because:

- They are numerous across the landscape.
- They feed larger streams and rivers - one of the best ways to protect larger rivers is to protect the small streams that flow into them.
- They can be readily impacted by sedimentation, erosion and non-point source pollution.

Legal Basis and Considerations for New Hampshire

This chapter is being prepared at a time when sweeping changes have been recommended to the State of New Hampshire's Comprehensive Shoreland Protection Act (CSPA). These changes, adopted by the legislature during 2007, will help to improve the implementation of the CSPA at both the state and local level.

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Under the current CSPA, municipalities may adopt land use ordinances (zoning, subdivision, site plan, etc.) to regulate protected shorelands within their boundaries. These ordinances can be more stringent than the minimum standards of the CSPA (see RSA 483-B:8, Municipal Authority). In fact, the CSPA encourages municipalities to adopt land use control ordinances designed to protect the shorelands of water bodies and water courses not subject to the CSPA. These other water bodies can include first and second order (headwater streams and tributaries), third order streams and rivers, lakes, and ponds, and other impoundments. In addition, municipalities may elect to enforce the provisions of the CSPA by issuing cease and desist orders, and by seeking injunctive relief or civil penalties as provided in RSA 483-B:18, III(a) and (b). One of the advantages of local enforcement is that any civil penalties and fines collected by the court, can be remitted to the treasurer of the municipality prosecuting violations, for use of the municipality. In order to enforce the provisions of the CSPA, however, municipalities must have a knowledgeable code enforcement officer on hand who understands and can apply the provisions of the act on a case by case basis.

The CSPA minimum standards are designed to overlay other state and municipal permitting programs. This means that state permitting programs such as Subsurface, Wetlands, and Alteration of Terrain as well as local building permits must ensure that any permits issued are in compliance with the CSPA.

Currently, the protected shoreland under the CSPA includes all land located within 250 feet of the reference line (see glossary for definition of reference line) of public waters and fourth order and higher streams.

Exemptions for forestry and agricultural activities are built into the CSPA and can be considered when establishing a local ordinance. The CSPA also provides an urban exemption for situations in which specialized urban conditions exist. This exemption requires the governing body to make a formal request to the Commissioner of DES to grant an exemption from the CSPA.

On July 1, 2005, the New Hampshire legislature established a commission to study the effectiveness of the CSPA. The commission's final report was released (NH DES 2006) and in the spring of 2007, most of the commission's recommendations were incorporated into state law, which became effective April 1, 2008. The following summarizes the legislative changes that are important considerations in developing a local shoreland protection ordinance:

- The setback for primary structures to protected shoreland shall be at least 50 feet in all towns whether or not the municipality has an established lesser setback.
- The current methodology for measuring and maintaining the natural woodland buffer (50 percent basal area removal/well distributed stand) would be replaced

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by establishing a waterfront buffer that extends 50 feet back from the reference line. Within the waterfront buffer there would be no root, rock, duff, or understory removals and no fertilizer or pesticide use. Tree cutting would be limited and would be managed in accordance with a grid and points system. Fifty percent of the area outside of permitted impervious surfaces would be left undisturbed.

- Impervious surfaces would be limited to 20 percent of the area within the protected shoreland. With mitigation, the impervious surface allowance could be up to 30 percent.
- The full protection of the CSPA would be extended to all third order and higher streams (including the Saco and Pemigewasset Rivers) as identified by the New Hampshire Hydrography Data Set.

Examples and Outcomes Where Techniques Have Been Applied

There are many municipalities in New Hampshire that have developed regulations to protect shorelands and riparian buffers. The Office of Energy and Planning currently maintains a list of 48 communities within New Hampshire that have adopted local regulations for shoreland and riparian protection (www.nh.gov/oep/resources.htm).

The model ordinance contained in this chapter provides municipalities with a new and effective tool for shoreland and riparian protection. Key provisions within the ordinance include:

- 25 foot setback for primary structures from the reference line for first and second order streams.
- 50 foot setback for primary structures from all third, fourth and higher order streams, lakes, ponds, and coastal estuaries.
- 20 percent impervious surface limitation requirement for any portion of any lot located within the shoreland protection district. (see sidebar)

[Margin Note: Municipalities may wish to consider a 10 percent impervious surface limitation as studies show that there is a level (between 7 and 14 percent impervious surface) at which water quality and wildlife habitat become affected by urban characteristics, such as impervious surface. These results are similar to other studies, where measures of impervious surface of about 10 percent have been identified as the level at which stream quality decreases (Schueler, 1995; Deacon and Soule, 2005).]

- The inclusion of conditional use permit requirements for water-dependent structures, including but not limited to docks, piers, breakwaters, boathouses

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and marinas, etc. Many of these uses currently require planning board approval subject to both local site plan review and DES permits as applicable.

- Requirements for the submittal of a stormwater management plan for all earth moving or excavation activities on lots greater than one acre in size.
- Requirement for planning board approval of a selected clearing and landscape plan. This plan applies to 1st, 2nd, and 3rd order streams only.

Model Language, Illustrations and Guidance for Implementation

MODEL ORDINANCE FOR SHORELAND AND RIPARIAN PROTECTION

Shoreland Zoning Ordinance for the Municipality of _____

I. TITLE AND AUTHORITY

- a. Title:** This Ordinance shall be known as the “Shoreland Protection District of the City/Town of _____, New Hampshire.”
- b. Authority:** Pursuant to the authority granted by RSA 483-B:8, Municipal Authority; RSA 674:17 I., Purposes of Zoning Ordinances; and RSA 674:21 I., Innovative Land Use Controls this ordinance is hereby adopted by the Town/City of _____, New Hampshire to protect the public health, safety, and general welfare.

II. PURPOSE

The purpose of this Ordinance is to establish regulations for the design of riparian buffers to protect the flowing streams and surface water bodies of the Town/City of _____ to protect the water quality of these resources; to protect the Town/City of _____’s riparian and aquatic ecosystems; and to provide for the environmentally sound use of the Town/City of _____’s land resources.

III. FINDINGS

The City/Town of _____, New Hampshire finds that shoreland protection and riparian buffers adjacent to flowing waters and surface water bodies provide numerous environmental benefits. Shoreland forested buffers serve to:

- a)** Restore and maintain the chemical, physical and biological integrity of the water resources.
- b)** Provide infiltration of stormwater runoff.

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- c) Remove pollutants delivered in stormwater runoff.
- d) Reduce erosion and control sedimentation.
- e) Stabilize lake and stream banks.
- f) Maintain base flow of streams.
- g) Contribute food and habitat for the aquatic ecosystem.
- h) Moderate the temperature of near shore waters.
- i) Provide and enhance terrestrial wildlife habitat.
- j) Enhance scenic value and recreational opportunities.

Therefore, the City/Town of _____, New Hampshire adopts this ordinance to protect and maintain the native vegetation along the shorelands of the community's water courses and surface waters by implementing standards for protection, use and development of these areas within the jurisdiction of the municipality.

IV. APPLICABILITY

a) **Shoreland Protection District.** The Shoreland Protection District of the City/Town of _____, New Hampshire is an overlay district superimposed over the existing conventional zoning districts of the municipality. It includes within its boundary a protected shoreland on either side of all 1st, 2nd, 3rd and 4th order and higher rivers and streams, and a protected shoreland adjacent to all natural and impounded lakes and ponds and coastal estuaries (if applicable) located within the municipality. The Shoreland Protection District does not apply to wetlands, ephemeral streams, beaver impoundments, fire ponds, and farm ponds as defined in this ordinance. The Shoreland Protection District subject to this Ordinance shall be shown on the municipality's **Official Shoreland Zoning Map**, which is incorporated as part of this Ordinance.

b) **Official Shoreland Zoning Map.**

1. **Scale of Map.** The Official Shoreland Zoning Map shall be drawn at a scale of not less than 1 inch = 2,000 feet. District boundaries shall be clearly delineated and a legend indicating the symbols for each district shall be placed on the map.

[Margin Note: Because of map scale or other reasons, a municipality may have a series of maps instead of one map depicting its shoreland protection district. The state's regional planning commissions are available to assist your municipality in preparing this map. A reliable source of stream location and stream order classification, i.e. the identification of first, second, third and fourth and higher streams within your municipality is available from the New Hampshire Hydrography Dataset (NHD) developed by Complex Systems Research Center, University of New Hampshire. The final report of the commission reviewing the

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effectiveness of the CSPA recommends that the state adopt the NHHD for the purpose of identifying stream order.

Planning boards are encouraged to include in their site plan and subdivision regulations, requirements for the submittal of surveyed plans depicting the true location of the streams, rivers and other water bodies subject to this ordinance within the subject property. This plan information can then be used to supplement the NHHD data.]

[Margin Note: Other reliable mapping resources include:

Stream Buffer Characterization Data and Maps

Town specific maps that assess 150 and 300 buffer areas

Online: www.nhep.unh.edu/resources/actions.htm

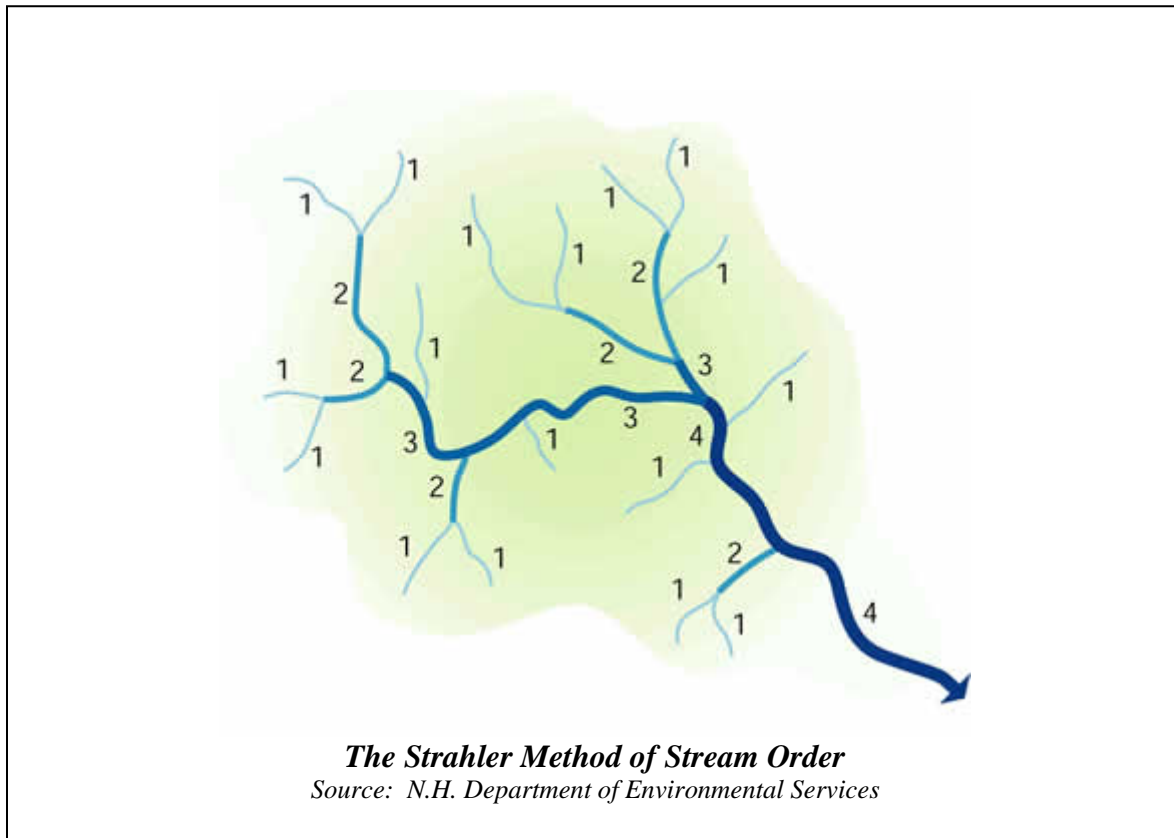
Buffer Data Mapper

Demonstrates the land area impact of various buffer widths

Online: <http://mapper.granit.unh.edu/viewer.htm>

List of New Hampshire Fourth Order Streams and Higher, Revision of May 5, 1995.

Online: www.des.state.nh.us/cspa/fourth.htm]



be carefully reviewed by local officials and legal counsel. For more information or comments on the content of this chapter, contact Eric Williams at the N.H. Department of Environmental Services, ewilliams@des.state.nh.us or (603) 271-2358.

2. **Certification of Official Shoreland Zoning Map.** The Official Shoreland Zoning Map shall be certified by signature of the Municipal Clerk and shall be located in the Municipal Planning Office. In the event the municipality does not have a planning office, the Municipal Clerk shall be the custodian of the map.
3. **Changes to the Official Shoreland Zoning Map.** If amendments are made to the Shoreland Protection District or other matters portrayed on the Official Shoreland Zoning Map, such changes shall be made on the map within 30 days after the amendment has been adopted by the municipality.

V. DISTRICT BOUNDARIES

- a) **Definition of District Boundaries.** The district boundaries of the Shoreland Protection District shall encompass all land within a horizontal distance of **150** feet of the reference line of any 1st and 2nd order stream, and **250** feet of the reference line of any 3rd and 4th order stream and higher, lake, pond or coastal estuary as defined by this Ordinance.
- b) **Interpretation of District Boundaries.** Where uncertainty exists as to the exact location of district boundary lines, the City/Town Code Enforcement Officer with the assistance of the N.H. Department of Environmental Services shall be the final authority as to boundary locations.

[Margin Note: Municipalities are encouraged to incorporate specific written descriptions of district boundaries into this Ordinance so that disputes over boundaries are minimized. The Official Shoreland Zoning Map is only one of the primary tools in determining district boundaries. Other tools include actual field verification of the reference line. This is where the assistance of DES will be the most useful.]

VI. DEFINITIONS

Accessory Structure or Use – A use or structure located on the same lot and customarily incidental and subordinate to the primary structure, including but not limited to paths, driveways, patios, any other improved surface, pump houses, gazebos, woodsheds, garages, or other outbuildings. A deck or similar extension of the primary structure or a garage attached to the primary structure by a roof or a common wall is considered part of the primary structure.

Base flow – The groundwater contribution to stream flow arising from submerged springs and seeps.

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Beaver Impoundment - An area this is generally inundated most of the year as a result of flowing water impounded by a beaver dam. Beaver impoundments and the meadows that develop when the dams are not kept up and deteriorate are generally considered wetlands.

Best Management Practices (BMPs) – A proven or accepted structural, non-structural, or vegetative measure the application of which reduces erosion or sedimentation, stabilizes stream channels, or reduces peak storm discharge, or improves the quality of stormwater runoff, or diminishes the quantity of stormwater runoff flowing to a single location by using multiple BMPs at separate and dispersed locations. BMPs also include construction site maintenance measures such as removing construction debris and construction waste from construction sites and disposing of debris and waste appropriately in order to reduce contamination of stormwater runoff.

Boat Slip – On water bodies over 10,000 acres, means a volume of water 25 feet long, 8 feet wide, and 3 feet deep as measured at normal high water and located adjacent to a structure to which a watercraft may be secured. On water bodies of 10,000 acres or less, a volume of water 20 feet long, 6 feet wide, and 3 feet deep as measured at normal high water mark and located adjacent to a structure to which a watercraft may be secured (RSA 482-A:2 VIII.).

Buffer – A vegetated area, including trees, shrubs and herbaceous vegetation, which exists or is established to protect a stream, river, lake, pond, reservoir, or coastal estuarine area.

Canopy – The more or less continuous vegetative cover formed by tree crowns in a wooded area.

Disturbed Area – An area in which natural vegetation is removed, exposing the underlying soil.

Ephemeral Stream – A drainage feature that carries only stormwater in direct response to precipitation with water flowing only during and shortly after large precipitation events. An ephemeral stream may or may not have a well defined channel, the aquatic bed is always above the water table, and stormwater runoff is the primary source of water. An ephemeral stream typically lacks the biological, hydrological, and physical characteristics commonly associated with the continuous or intermittent conveyance of water.

Estuaries – A tidal wetland whose vegetation, hydrology or soils are influenced by periodic inundation of tidal waters.

Farm Pond - A small, shallow (3-14 foot) artificial impoundment maintained for private recreational use, such as fishing or swimming, or to provide water for livestock, irrigation, or other agricultural uses. Such ponds may be addressed as part of an approved USDA Natural Resources Conservation Service conservation plan and as such do not need to be protected by this Ordinance.

Fire Pond – A small, naturally-occurring or artificially constructed water body designated and maintained for the purpose of providing water for fire suppression, characterized by large-vehicle access to the water’s edge throughout the year and/or the presence of a dry hydrant. Typically such ponds have been identified or designated by the municipality’s fire department as a fire pond.

First Order Streams – Are intermittent and perennial streams identified as either dashed lines or solid lines on the New Hampshire Hydrography Dataset (NHHD) or the most recent edition of USGS topographic maps, where mapped.

[Margin Note: Defining “First Order Streams” is perhaps the most difficult issue in developing this ordinance. This model ordinance defines first order streams as both intermittent and perennial streams because these streams are the most important headwater streams within a watershed. However, municipalities may elect to limit the application of this ordinance to “perennial” streams only. To accomplish this, intermittent streams would need to be excluded from the definition of first order streams. This would require revisions to the NHHD database, because intermittent streams are currently identified as first order streams in this database.]

Forest Management – The application of scientific and economic principles to conserve forest resources and obtain forest benefits.

Great Pond – All natural bodies of fresh water situated entirely in the state having an area of 10 acres or more are state-owned public waters, and are held in trust by the state for public use; and no corporation or individual shall have or exercise in any such body of water any rights or privileges not common to all citizens of this state; provided, however, the state retains its existing jurisdiction over those bodies of water located on the borders of the state over which it has exercised such jurisdiction (RSA 271:20).

Ground Cover – Any herbaceous or woody plant that normally grows to a mature height of two feet or less, especially mat-forming vegetation which stabilizes the soil.

Headwater Streams – Intermittent streams and perennial streams of first and second order.

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Impervious Surface – Any areas covered by material that impedes the infiltration of water into the soil. Examples of impervious surfaces include buildings, roofs, decks, patios, and paved, gravel, or crushed stone driveways, parking areas, and walkways.

Intermittent Streams – A well-defined channel that contains water for only part of the year, typically during winter and spring when the aquatic bed is below the water table. The flow may be heavily supplemented by stormwater runoff. An intermittent stream often lacks the biological and hydrological characteristics commonly associated with the conveyance of water. Intermittent streams (or portions thereof) are portrayed as dashed blue lines on a USGS topographic map, where mapped).

Lake – A natural or impounded inland body of fresh water. May also be called a pond or great pond.²

Lot of Record – A legally created parcel, the plat or description of which has been recorded at the registry of deeds for the county in which it is located.

Marina – A commercial waterfront facility whose principal use is the provision of public services such as the securing, launching, storing, fueling, servicing, repairing and sales of watercraft equipment and accessories.

Natural Vegetation – All existing live woody and herbaceous trees, shrubs, and other plants.

Natural Woodland Buffer – Is defined in the CSPA, RSA 483-B as a forested area consisting of various species of trees, saplings, shrubs, and ground covers in any combination and at any stage of growth.

Non-Conforming Lot – A single lot of record which, at the effective date of adoption or amendment of this Ordinance, does not meet the dimensional requirements of the district in which it is located.

Non-Conforming Structure – A structure which does not meet any one or more of the following dimensional requirements; setback, height, or lot coverage, but which is allowed solely because it was in lawful existence at the time this Ordinance or subsequent amendments take effect.

Non-Conforming Use – Use of buildings, structures, premises, land or parts therefore which is not permitted in the district in which it is situated, but which is

² The terms lakes and ponds are commonly used interchangeably, however, a lake can be distinguished from a pond because a lake contains a thermocline layer while a pond does not.

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allowed to remain solely because it was in lawful existence at the time this Ordinance or subsequent amendments take effect.

Mean High Water Level – See Reference Line definition.

Ordinary High Water Mark – Means the line on the shore, running parallel to the main stem of the river or stream, established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the immediate bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial Streams – A stream that normally flows year round because it is sustained by groundwater discharge as well as by surface water. A perennial stream exhibits the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water. Perennial streams (or portions thereof) are portrayed as solid blue lines on a USGS topographic map, where mapped.

Pond – Means a natural or impounded still body of water. The term is often used interchangeably with “lake.”

Primary Structure – A structure built for the support, shelter or enclosure of persons, animals, goods, or property of any kind, as well, as anything constructed or erected with a fixed location on or in the ground, exclusive of fences. The primary structure is central to the fundamental use of the property and is not accessory to the use of another structure on the same premises.

Protected Shorelands – The area subject to this Ordinance.

Public Waters – See CSPA, RSA 483-B:4, Definitions.

Reference Line – Is defined in the CSPA, RSA 483-B and under this Ordinance as follows:

- (a) For natural fresh water bodies without artificial impoundments, the natural mean high water level as determined by the NH Department of Environmental Services.
- (b) For artificially impounded fresh water bodies with established flowage rights, the limit of the flowage rights, and for water bodies without established flowage rights, the waterline at full pond as determined by the elevation of the spillway crest.
- (c) For coastal waters, the highest observable tide line, which means a line defining the furthest landward limit of tidal flow, not including storm events, recognized by indicators such as the presence of a strand line of

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flotsam and debris, the landward margin of salt tolerant vegetation, or a physical barrier that blocks further flow of the tide.

- (d) For third and fourth order and higher rivers and streams, the ordinary high water mark.
- (e) For first and second order streams, the extent of the defined channel.

Removal or Removed – Cut, sawed, pruned, girdled, felled, pushed over, buried, burned or otherwise destructively altered.

Riparian Area – The area of land adjacent to the shoreline or bank of a stream, river, pond, lake, bay, estuary, or other similar body of water.

Riparian Buffer – See Buffer definition.

Sapling – A young tree less than four inches (9.75 cm) in diameter (dbh) and less than 20 feet in height.

Selected Clearing and Landscape Plan – A site plan drawn to scale depicting the lot boundaries, shoreland protection district boundaries, shoreline, reference line, all impervious surfaces, structures, septic and well systems, setback requirements, proposed view corridor, and existing and proposed trees and vegetation.

Setback – Horizontal distance from the reference line of a water body to the nearest part of a structure, road, parking space or other regulated object or area.

Shoreland – The area of land adjacent to the reference line of a stream, river, pond, lake, bay, estuary, or other similar body of water.

Shoreland Frontage – The average of the distances of the actual natural shoreline frontage and a straight line drawn between the property lines (RSA 483-B:4, Definitions).

Shoreline – The intersection of a specified plane of water with the beach or bank. It migrates with changes of the water level.

Shrub – A woody perennial, smaller than a tree, usually branching from the base with several main stems.

Stream Order – A classification system for streams based on stream hierarchy. The smaller the stream, the lower its numerical classification. For example, a first order stream does not have tributaries and normally originates from springs or seeps. At the confluence of two first order streams, a second order stream begins and at the confluence of two second order streams, a third order stream begins, et.seq.

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[Margin Note: Stream ordering is a widely applied method for classifying streams. Its use in classification is based on the premise that the order number has some relationship to the size of the contributing area, to channel dimensions and to stream discharge (Strahler 1964). The most common method used in stream ordering is based on the Strahler Method. This method is applied by DES and GRANIT in classifying streams within the New Hampshire Hydrography Dataset.]

Stream or River – A free-flowing body of water or segment or tributary of such water body (RSA 483:4, XVII.).

Structure – Anything built for the support, shelter or enclosure of persons, animals, goods or property of any kind, together with anything constructed or erected with a fixed location on or in the ground, exclusive of fences, and poles, wiring and other aerial equipment normally associated with service drops as well as guying and guy anchors. The term includes structures temporarily or permanently located, such as decks, patios, and satellite dishes.

Stormwater or Surface Water Runoff – Water that flows over the surface of the land as a result of rainfall or snow-melt. Surface water enters streams and rivers to become channelized stream flow.

Stormwater Management Plan – An analysis and plan designed in accordance with rules adopted by the DES under RSA 541-A for terrain alteration under RSA 485-A:17, to manage stormwater and control erosion and sediment, during and after construction.

Surface Waters – Those portions of waters of the state as defined by RSA 482-A:4, which have standing water or flowing water at or on the surface of the ground. This includes but is not limited to rivers, streams, lakes, ponds and tidal waters (Env-Wt 101.88).

Timber Harvesting – The cutting and removal of timber for the primary purpose of selling or processing forest products.

Tree – A woody perennial having a main stem.

USGS (United States Geological Survey) topographic map – A map that uses contour lines to represent the three-dimensional features of a landscape on a two-dimensional surface. Map scale – 1:24,000.

Water Body – Any pond, lake, river or stream.

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Water Dependent Use or Structure – A use or structure that services and supports activities that require direct access to, or contact with the water, or both, as an operational necessity and that requires a permit under RSA 482-A, including but not limited to a dock, pier, breakwater, beach, boathouse, retaining wall, or launching ramp. Hydroelectric facilities, including, but not limited to, dams, dikes, penstocks, and powerhouses, shall be recognized as water dependent structures, however, these uses are exempt from the requirements of this Ordinance.

Wetlands – areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (RSA 482-A:2).

VII. SHORELAND PROTECTION DISTRICT REGULATIONS

[Margin Note: The following shoreland protection regulations are modeled after specific provisions of the CSPA (RSA 483-B) as applicable, the recommendations contained within the Final Report of the Commission to Review the Effectiveness of the CSPA, as well as the DES Model Rule for the Protection of Water Supply Watersheds. Some noted key provisions include a 25-foot setback for primary structures from the reference line of first and second order streams, a 50-foot setback for all other water bodies, a maximum impervious surface requirement of 20 percent of the lot area located within the shoreland protection district, and Conditional Use requirements for water-dependent uses and structures. The riparian buffer requirements included within this ordinance are modeled after the three-stage riparian buffer design and buffer model ordinance favored by the journal *Watershed Protection Techniques* and developed by the Center for Watershed Protection, Elliot City, Maryland.]

a) Prohibited Water Pollution Hazards, Uses, Structures and Activities

The following uses, structures and activities are prohibited within the Shoreland Protection District:

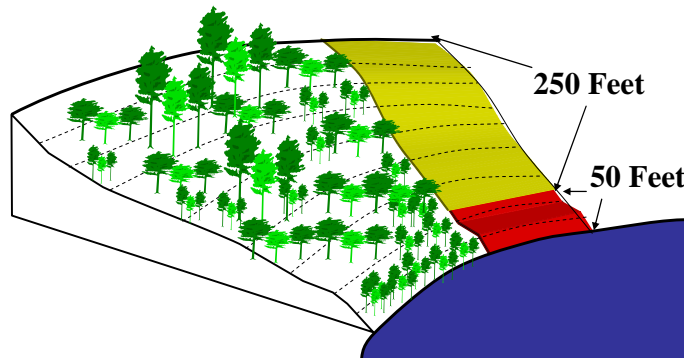
1. Establishment or expansion of salt storage yards, automobile junk yards and solid or hazardous waste facilities.
2. Establishment or expansion, dry cleaning establishments and automobile service/repair shops.
3. Laundry/car wash establishments not on municipal or public sewer.
4. Subsurface disposal of pollutants from sewage treatment facilities, other than on-site septic systems.

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5. Storage of hazardous substances, including the use of road salt, de-icing chemicals, herbicides, pesticides, or fertilizer, (except limestone) within 50 feet of the reference line of any property. Fifty feet beyond the reference line, low phosphate, slow release nitrogen fertilizer or limestone may be used on areas that are already vegetated.
6. Bulk or temporary storage of chemicals above or below ground.
7. Bulk or temporary storage of petroleum products or hazardous materials above or below ground, excluding normal residential or business use of liquid petroleum products and heating fuels for on-premise use.
8. Sand and gravel excavations as defined in RSA 155-E.
9. Mining or the processing of excavated materials.
10. Any use or activity not expressly permitted.

Fertilizer and Pesticide Restrictions

- **No fertilizer or pesticide within 50 feet of the reference line.**
- **From 50 feet to 250 feet only low phosphate, slow release nitrogen**



Source: N.H. Department of Environmental Services

b) Permitted Uses, Structures and Activities

All necessary state and local approvals and permits shall be obtained prior to the commencement of any activity within the Shoreland Protection District.

The following uses, structures and activities are permitted within the Shoreland Protection District, subject to state and local approval:

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1. All permitted uses allowed within the municipality's underlying zoning district(s), except those uses expressly prohibited as listed above.
2. All primary structures shall be setback a minimum distance of 25 feet from the reference line of all first and second order streams, 50 feet of all third order and higher streams, lakes, ponds, and coastal estuaries as required by the CSPA.
3. All accessory structures shall be setback a minimum distance of 25 feet from the reference line of all streams, lakes, ponds and coastal estuaries.
4. Water-dependent structures, or any part thereof, built over, on or within adjacent public waters subject to the jurisdiction of RSA 483-B 9.2c. shall be constructed only as approved by the DES, pursuant to RSA 482-A. All water-dependent uses or structures or parts thereof, built over, on or within the adjacent waters subject to this Ordinance shall be required to obtain a Conditional Use Permit from the planning board of the municipality in accordance with the requirements of subsection c) Conditional Uses below.
5. Other permitted uses within the Shoreland Protection District, subject to necessary local and state approval, include the following:
 - a. Public water supply facilities, including water supply intakes, pipes, water treatment facilities, pump stations and disinfectant stations.
 - b. Public water and sewage treatment facilities.
 - c. Hydroelectric facilities, including, but not limited to dams, dikes, penstocks and powerhouses.
 - d. Public utility lines and associated structures and facilities.
 - e. Existing solid waste facilities, including the construction of accessory structures and other activities consistent with the operation of the facility and its solid waste permit, including filling, grading and installing monitoring wells and other drainage structures.
 - f. Flood control structures.
 - g. Public roads and public access facilities, including boat ramps.

c) Conditional Uses

The following Conditional Uses are permitted within the Shoreland Protection District, subject to all applicable local, state and federal regulations:

1. Marinas developed in accordance with the following requirements:
 - a. Minimum shoreland frontage shall be 300 feet with an additional 25 feet of shoreland frontage per boat slip.
 - b. Off street parking shall be provided at a rate of 500 square feet per boat slip.
 - c. Submission of an environmental impact study including measures to mitigate potential negative impact on the adjacent waters, including but not limited to:

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- (1) Measures to prevent leakage or spills of fuels, lubricants, wastewater and other potential pollutants into the public waters.
- (2) Assurances that impact on wetlands and other related sensitive areas have been avoided.
- d. Submission of a site plan, that is consistent with local regulations, for review by the planning board, which includes locations of rest rooms, buildings, parking areas and all related support facilities with assurances that these facilities shall be permanently available to the project.
- e. Receipt of a wetland permit from DES.
- 2. Water dependent uses and structures including, but not limited to, docks, wharves, boat ramps, etc. All water dependent uses and structures shall be approved as a Conditional Use Permit in accordance with the following requirements:
 - a. The use is in keeping with the purpose and intent of this Ordinance.
 - b. The least impacting route and methodology for the use have been selected as the best practicable alternative.
 - c. Canopies and seasonal covers extend only over the boat slips and shall be removed during the non boating season.

d) Minimum Lot Requirements

- 1. The minimum size for new lots in areas dependent upon on-site subsurface wastewater systems shall be determined by either the municipality's underlying zoning district requirements or the soil type lot size determinations, as established by the DES under RSA 485-A and rules adopted to implement it.
- 2. The total number of residential units in the protected shoreland district, whether built on individual lots or grouped as cluster or condominium development, shall not exceed:
 - a) One unit per 150 feet of shoreland frontage; or
 - b) For any lot that does not have direct frontage, one unit per 150 feet of lot width as measured parallel to the shoreland frontage that lies between the lot and the reference line.
- 3. The total constructed, impervious surface area within any lot shall not exceed 20 percent of the area of the lot located within the shoreland protection district. In instances when the existing tree cover has been depleted, 25 percent impervious coverage may be granted in exchange for additional native tree and shrub planting within 50 feet of the reference line. This should be enforced through a deed restriction whereby the property owner agrees not to cut after the trees are planted.

e) Subsurface Wastewater Disposal Facilities

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1. All new lots, including those in excess of five acres, any portion of which is located within the Shoreland Protection District, shall require subdivision approval by the DES Water Division, Subsurface Systems Bureau pursuant to RSA 485-A:29. All subsurface wastewater disposal facilities shall be in compliance with RSA 485-A:29 and 483-B.

g) Erosion and Siltation

1. New structures and all modifications to existing structures within the Shoreland Protection District shall be designed, constructed and maintained to prevent the release of surface runoff across exposed mineral soils.
2. All earth moving or excavation activities on lots greater than 1 acre in size either partially or wholly within the Shoreland Protection District, including the construction of new structures and modifications to existing structures shall be conducted in accordance with a stormwater management plan approved by the municipality's planning board. Such plan shall be designed in accordance with rules adopted by the DES under RSA 541-A for terrain alteration under RSA 485-A:17, to manage stormwater and control erosion and sediment, during and after construction. All erosion control measures shall be implemented before any earth disturbance occurs.
3. In new developments, on-site and non-structural stormwater management alternatives shall be preferred over larger facilities within the riparian buffer.
4. When constructing stormwater management facilities, the area cleared shall be limited to the area required for construction, and adequate maintenance access only.
5. A permit under RSA 485-A:17, I. shall be required for developed, or subdivided land whenever there is a contiguous disturbed area exceeding 50,000 square feet that is either partially or wholly within the Shoreland Protection District.

h) Riparian Buffer Requirements

[Margin Note: The riparian buffer standards included in this ordinance are based upon the Center for Watershed Protection's Buffer Model Ordinance and as such these standards present the best technical guidance available to create and protect the most effective riparian buffers possible.

Also included are appropriate buffer standards from New Hampshire's CSPA and the Commission's recommendations where applicable. Municipalities should use these standards as a guide to adopt the most appropriate buffer requirements for their community considering such factors as existing site conditions, ease of

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enforcement, public acceptance, and the sensitivity and vulnerability of the water body to be regulated.

Municipalities are also encouraged to include a reference to these standards in their site plan and subdivision regulations and to add a checklist item or requirement that the location of all streams and water bodies be surveyed and accurately shown on site plans and subdivisions.]

Riparian Buffer. Within the Shoreland Protection District, a riparian buffer of natural vegetation and trees shall be maintained or established within **75** feet of the reference line of all first and second order streams, and **150** feet of the reference line of all third and fourth and higher order streams, lakes, ponds and coastal estuaries. This riparian buffer is similar in terminology to the Natural Woodland Buffer under the CSPA.

To address areas containing steep slopes, the following formula recommended by the Center for Watershed Protection should be used to expand the riparian buffer widths as noted above:

Percent Slope*	Width of Buffer
15%-17%	add 10 feet
18%-20%	add 30 feet
21%-23%	add 50 feet
> 24%	add 60 feet

*Percent slope shall be based on an average of the overall slope dividing the average vertical distance of the slope into the overall horizontal distance of the slope.

*Source: Southern New Hampshire Planning Commission.
Adapted from Center for Watershed Protection*

Within the riparian buffer, the following management zones shall be maintained.

- 1. Waterfront Zone:** The waterfront zone is located closest to the water's edge and serves to protect the physical and ecological integrity of the shoreland. This zone must be maintained in a natural state although a view corridor and a maximum 6 feet wide path to the water's edge may be established in accordance with an approved Selected Clearing and Landscape Plan. This zone extends a minimum distance of **25** feet from the reference line for 1st and 2nd order streams and a minimum distance of **50** feet from the reference line for all other water bodies. Allowable uses within the waterfront zone are restricted to flood control structures, utility rights of way, footpaths, road crossings such as bridges and culverts as required and water-dependent

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structures and uses where permitted under Section VII. b. and c. of this ordinance. Target sediment and pollutant removal rates are to be within 50 percent and 60 percent.

[Margin Note: A minimum fixed buffer width of 10 meters or 33 feet is documented in the scientific literature as providing approximately 60 percent or greater sediment and pollutant removal while minimally protecting the adjacent water body (Source: Desbonnet et al. 1994 and Center for Watershed Protection).]

Within the Waterfront Zone, the following additional prohibitions and limitations apply:

- a. No mechanized logging, no clear cutting of trees, and no cutting or removal of vegetation and natural ground cover (including the duff layer) below 3 feet in height shall be permitted, except as provided by an approved Selected Clearing and Landscape Plan.
- b. Restricted tree care involving the removal of dead, diseased, unsafe, or fallen trees, saplings, shrubs is permitted. All stumps and their root systems, stones, and duff shall be left intact in or on the ground.
- c. A view corridor and path to the water's edge may be established in accordance with a **Selected Clearing and Landscape Plan** submitted to and approved by the planning board of the municipality.³ This plan shall include photographic documentation of the pre-existing riparian buffer. The view corridor shall not exceed 75 feet in width or one-third the width of the shoreline frontage, whichever is less. View corridors must also be in compliance with the CSPA, Natural Woodland Buffer requirements, RSA 483-B.
- d. Preservation of dead and living trees that provide dens and nesting places for wildlife is encouraged.
- e. Planting and reforestation efforts to restore native vegetation within this zone is encouraged.

2. **Middle Zone:** The middle zone begins at the outer edge of the waterfront zone extending out a minimum fixed distance of **25** feet for 1st and 2nd order streams and a minimum distance of **50** feet for all other water bodies. The overall width of the middle zone can vary depending upon stream order and slope. Target sediment and pollutant removal rates are to be within 60 to 70 percent. Forest management and limited tree clearing and removal are allowed within the middle zone as well as limited recreational uses, stormwater BMPs, paths, and other similar uses as permitted under Section VII. b. and c. of this

³ An example of a Selective Clearing and Landscape Plan can be found in Randolph, 2004, Figure 14.3, pg. 446.

ordinance. However, a minimum of 50 percent of the tree canopy within this zone shall remain in an undisturbed state. Overall tree canopy shall be managed through a Selective Clearing and Landscape Plan.

[Margin Note: A minimum fixed buffer width of 15 meters or 50 feet is documented in the scientific literature as providing greater than 60 percent sediment and pollutant removal while providing minimal general wildlife and avian habitat value. (Center for Watershed Protection).]

Within the middle zone, the following additional prohibitions and limitations apply:

- a. Impervious surfaces on the portion of the lot within the shoreland protection district shall be limited to 20 percent subject to Section D. 3. of this ordinance.
 - b. No mechanized logging or clear cutting of trees and vegetation shall be permitted.
 - c. Limited tree removal and clearing, tree pruning, including the removal of dead, diseased, unsafe, or fallen trees, saplings, shrubs is permitted. All stumps and their root systems shall be left intact in the ground.
 - d. Fifty percent of this zone should remain in an undisturbed state.
 - e. A view corridor and path to the water's edge may be established in accordance with a **Selected Clearing and Landscape Plan** approved by the planning board of the municipality. No more than 50 percent of the tree canopy within this zone may be removed as shown on the **Selected Clearing and Landscape Plan**.
 - f. Preservation of dead and living trees that provide dens and nesting places for wildlife is encouraged.
 - g. Planting and reforestation efforts to restore the native vegetation within this zone is encouraged.
3. **Outer Zone:** The function of the outer zone is to prevent encroachment into the inner and middle zones of the riparian buffer and to filter runoff from adjacent residential and commercial development. The outer zone begins at the outer edge of the middle zone extending out a minimum distance of **25** feet for 1st and 2nd order streams and-a minimum distance of **50** feet for all other water bodies. Target sediment and pollutant removal rates are to be within 70 to 90 percent.

[Margin Note: A minimum fixed buffer width of 20 meters or 66 feet is documented in the scientific literature as providing 70 percent or greater sediment and pollutant

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removal while providing minimal general wildlife and avian habitat value. (Source: Desbonnet et al. 1994 and Center for Watershed Protection).]

Within the outer zone, the following additional prohibitions and limitations apply:

- a. Tree removal and clearing, tree pruning, including the removal of dead, diseased, unsafe, or fallen trees, saplings, shrubs is permitted in accordance with a **Selected Clearing and Landscape Plan** approved by the planning board of the municipality.
- b. No more than 50 percent of the tree canopy within this zone may be removed as shown on the **Selected Clearing and Landscape Plan**.
- c. Preservation of dead and living trees that provide dens and nesting places for wildlife is encouraged.
- d. Planting and reforestation efforts to restore the natural vegetation within this zone is encouraged.
- e. Impervious surfaces on the portion of the lot within the shoreland protection district shall be limited to 20 percent subject to Section D. 3. of this ordinance.

VIII. NON CONFORMING LOTS, USES AND STRUCTURES

- a) **General Purpose:** It is the intent of this Ordinance to promote the conforming use of land located within the Shoreland Protection District, except that non-conforming lots, structures and uses that existed before the effective date of this Ordinance or amendments thereto shall be allowed to continue, subject to the requirements as set forth in this section. Except as otherwise provided in this Ordinance, a non-conforming lot, use or structure shall not be permitted to become more non-conforming.
- b) **Non-conforming Lots:** Non-conforming, undeveloped lots of record that are located within the Shoreland Protection District shall comply with the following restrictions, in addition to any other requirements of the municipality's zoning ordinance:
 1. Except when otherwise prohibited by law, present and successive owners of an individual undeveloped lot may construct building or structure on it, notwithstanding the provisions of this Ordinance.
 2. Conditions may be imposed which, in the opinion of the municipality's Zoning Board of Adjustment as appropriate, more nearly meet the intent of this Ordinance, while still accommodating the applicant's rights.

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3. Building on non-conforming lots of record also include but not limited to docks, piers, boathouses, boat loading ramps, walkways, and other water dependent structures, consistent with this Ordinance.
- c) **Non-conforming Uses:** Existing uses that are non-conforming under this ordinance may continue until the use ceases to exist or the use is discontinued for a period of one year. An existing non-conforming use may not be changed to another non-conforming use; existing non-conforming uses shall be required to meet the requirements of this ordinance to the maximum extent possible.
 - d) **Non-conforming Structures:** Except as otherwise prohibited, non-conforming structures, erected prior to the effective date of this Ordinance or amendments thereto, located within the Shoreland Protection District may be repaired, renovated, or replaced in kind using modern technologies, provided the result is a functionally equivalent use. Such repair or replacement may alter the interior design or existing foundation, but no expansion of the existing footprint or outside dimensions shall be permitted. An expansion that increases the sewage load to an on-site septic system, or changes or expands the use of a septic system or converts a structure to condominiums or any other project identified under RSA 485-A:29-44 and rules adopted to implement it shall require DES approval. Between the primary building line and the reference line as shown on the following figure, no alteration shall extend the structure closer to the adjacent water body, except that the addition of a deck is permitted up to a maximum of 12 feet towards the reference line.

IX. RIPARIAN BUFFER MANAGEMENT, MAINTENANCE AND INSPECTION.

- a) It shall be the responsibility of every property owner within the Shoreland Protection District to manage and maintain the vegetation and natural conditions existing within the riparian buffer located on their property. Management includes specific limitations on the alteration of the natural conditions of these resources as specified by this Ordinance. To help property owners assume this responsibility, it shall be the duty of every property owner to secure and install markers every 50 feet on trees depicting the location of the riparian buffer on their property.

[Margin Note: These buffer markers should be designed and sold by the conservation commission of the municipality to property owners. Examples of tree markers can be obtained from the Town of Bow, N.H. Installation and cost of the markers should be the responsibility of the property owner.]

- b) It shall be the responsibility of the planning board of the municipality to ensure that all plats and rights of way, prepared for recording, and site plans adopted by the planning board clearly:
 - 1. Show the extent of the riparian buffer on the subject property by metes and bounds.
 - 2. Label the riparian buffer, building setbacks, and the waterfront, middle and outer zones of the riparian buffer.
 - 3. Provide a note to reference the riparian buffer stating: “There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by the planning board of the municipality.”
 - 4. provide a note to reference any protective covenants governing the riparian buffer area stating: “Any riparian buffer shown hereon is subject to protective covenants which may be found in the land records and which restrict disturbance and use of these areas.”
- c) It shall be the responsibility of the planning board of the municipality through aerial photography to inspect the integrity of the riparian buffer both annually and immediately following severe storms for evidence of sediment deposition, erosion, or concentrated flow channels and corrective actions taken to ensure the integrity and functions of the riparian buffer.

[Margin Note: Procedures for conducting these inspections should be developed by the planning board and the municipality. This should also include obtaining photographic documentation of the integrity of the riparian buffer as part of the review and approval of stormwater management or selective clearing and landscape plans.]

X. EXCEPTIONS

The following land uses are exempt from the provisions of this Ordinance:

- a) Forest management not associated with shoreland development or land conversion, and conducted in compliance with RSA 227-J:9.
- b) Forestry involving water supply reservoir watershed management.
- c) Agriculture activities and operations as defined in RSA 21:34-a. (except animal feedlots) provided such activities and operations are conducted in accordance with best management practices.
- d) Temporary stream, stream bank, and other vegetation restoration projects, the goal of which is to restore the shoreline and riparian buffer to an ecologically healthy state.
- e) Wildlife and fisheries management activities consistent with the State Wildlife Action Plan and applicable state laws.
- f) The creation of foot path(s) to the water in accordance with an approved selective clearing and landscape plan and the construction of perched sandy beaches in accordance with a wetland permit issued by DES.

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- g) Other uses permitted by the DES or under Section 404 of the Clean Water Act. Notwithstanding the above, all except uses, structures or activities shall comply with all applicable best management practices and shall not diminish water quality as defined by the Clean Water Act. All excepted uses shall be located as far from the reference line as reasonably possible.

SUMMARY OF MODEL ORDINANCE SHORELAND PROTECTION DISTRICT AND RIPARIAN BUFFER STANDARDS

SHORELAND PROTECTION DISTRICT

- 150 feet for 1st and 2nd order streams and 250 feet for all other water bodies.
- Establishment/expansion of salt storage yards, auto junk yards, solid waste and hazardous waste facilities, animal feedlot operations, dry cleaning establishments, automobile service/repair shops, laundry/car wash establishments not on municipal water or sewer, disposal or land application of biosolids, including septage, sewage sludge and animal manure are prohibited.
- Subsurface disposal of pollutants from sewage treatment facilities, other than on-site septic systems, storage or hazardous substances, including the use of road salt and de-icing chemicals are prohibited.
- Bulk or temporary storage of chemicals above or below ground, bulk or temporary storage of petroleum products or hazardous materials above or below ground, excluding normal residential or business use of liquid petroleum products and heating fuels for on-premise use are prohibited.
- Sand and gravel excavations as defined in RSA 155-E, mining or the processing of excavated materials, and any other use or activity not expressly permitted.
- No fertilizer, except limestone between the reference line and 50 feet. From 50 feet landward of the reference line to 250 feet only low phosphate, slow release nitrogen fertilizer may be used.

Impervious Surface Area Limitations:

- Total constructed, impervious surface area is limited to 20percent of a lot either partially or wholly located within the shoreland protection district. This may be increased to 25 percent in exchange for additional native tree and shrub planting within 50 feet of the reference line through a deed restriction.

Stormwater Management:

- All earth moving or excavation activities on lots greater than 1 acre in size either partially or wholly within the shoreland protection district, including the construction of new structures and modifications to existing structures must be conducted in accordance with an approved stormwater management plan per NHDES specifications under RSA 541-A for terrain alteration and RSA 485-A:17 to manage stormwater and control erosion and sediment, during and after construction.
- A permit is also required under RSA 485-A:17, I. for developed, or subdivided land whenever there is a contiguous disturbed area exceeding 50,000 square feet that is partially or wholly within the shoreland protection district.

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RIPARIAN BUFFER STANDARDS:

- **Waterfront Zone:** 25 feet from reference line for 1st and 2nd order streams and 50 feet for all other water bodies. The Waterfront Buffer must be maintained in a natural state, although a view corridor and path to the water's edge may be established in accord with an approved plan.
- **Clearing and Landscape Plan.** No mechanized logging, no clear cutting of trees, and no cutting or removal of vegetation and natural ground cover (including the duff layer) below 3 feet in height is allowed, except as provided by this plan. Restricted tree care involving the removal of dead, diseased, unsafe, or fallen trees, saplings, shrubs is permitted. All stumps and their root systems, stones and duff shall be left intact in or on the ground.
- **Middle Zone:** 25 feet from the edge of the waterfront zone for 1st and 2nd order streams and 50 feet for all other water bodies. Forest management and limited tree clearing and removal are allowed. No more than 50 percent of the tree canopy within this zone can be removed. Overall tree coverage is managed through a Selected Clearing and Landscape Plan.
- **Outer Zone:** 25 feet from the edge of the middle zone for 1st and 2nd order streams and 50 feet for all other water bodies. No more than 50 percent of the tree canopy within this zone may be removed. Tree removal and clearing, tree pruning, including the removal of dead, diseased, unsafe, or fallen trees, saplings, shrubs is permitted.
- **Selected Clearing and Landscape Plan:** This plan is required in order to establish a view corridor and path to the water's edge as well as document the pre-existing riparian buffer conditions on the lot. The view corridor shall not exceed 75 feet in width or one-third the width of the shoreline frontage, whichever is less. View corridors must also be in compliance with the CSPA, Natural Woodland Buffer requirements per RSA 483-B.

PRIMARY BUILDING LINE:

- Primary structures must be set back at least **25** feet from the reference line for 1st and 2nd order streams and **50** feet for all other water bodies.

ACCESSORY STRUCTURES

- Accessory structures must be setback at least **25** feet from the reference line.

REFERENCE LINE

- For coastal waters = highest observable tide line
- For rivers = ordinary high water mark
- For natural fresh water bodies = natural mean high water level
- For artificially impounded fresh water bodies – water line at full pond

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