

MUNICIPAL ASSISTANCE CENTER TECHNICAL PAPER #6



Protecting Vermont's Lakes through Shoreland District Zoning JUNE 2011

I. INTRODUCTION

Lakes are an important part of the social and natural landscape of Vermont. Many of the features lakefront property owners appreciate and enjoy about their properties such as natural scenic beauty, tranquility, privacy and relaxation are enhanced and preserved with good shoreland management. Healthy lakes with good water quality translate into healthy lake front property values.

The way a town chooses to manage its shorelands can greatly impact the water quality and the aquatic and terrestrial wildlife in and around Vermont's lakes. Maintaining shoreland buffers – the vegetated areas adjacent to lakes and ponds – is the most widely recommended and scientifically supported approach to protecting lake habitat and reducing pollution in stormwater runoff from uphill land uses. Building too close to the water, clearing a shoreland lot of its natural vegetation or covering too much of it with driveway and rooftop surfaces can increase stormwater runoff, erosion, nonpoint source pollution (especially phosphorous and sediment), harm habitat and destabilize shoreline banks.

Shoreland zoning is a tool municipalities can use to help protect and maintain a shoreline that is rich in diverse vegetation and a buffer zone effective in curbing runoff pollution and providing habitat for wildlife. Shoreland zoning can also provide standards for development to ensure that dwellings and other structures within the shoreland district are compatible with the natural surroundings. This paper, along with the VLCT Municipal Assistance Center's Model Lake Shoreland Protection District Bylaw (also referred to as the *model*), provides guidance to municipal officials who want to adopt shoreland zoning. The model includes measures such as setbacks, clearing limitations, vegetation protection, land disturbance management, and impervious area standards to protect shoreland buffers and water quality from the adverse impacts of development.

II. NEED FOR SHORELAND PROTECTION

Vermont has 292 lakes that are 20 acres or greater in size, and more than 800 lakes that are five acres or larger. According to the Vermont Department of Environmental Conservation (DEC), the rapid growth along Vermont's lakeshores threatens to increase water quality problems such as excessive algae and plant growth and degradation of in-lake and shoreland habitat. Much of this development pressure takes the form of redevelopment where seasonal small camps located close to shore are being converted to year-around permanent residences with larger lawns and increased impervious surfaces. This trend toward bigger homes and more clearing poses the largest threat to Vermont lakes.

In a report to the Vermont General Assembly in 2011, the DEC indicated that only about 20 percent of Vermont's towns have regulations protecting buffers and requiring building setbacks adequate to protect shoreland vegetation, thus protecting lake water quality, and habitat. Biologists from the Lakes and Ponds Section of DEC have been studying the effects of shoreland development on shallow water habitat for several years. The science supporting the evidence that buffered shores are essential for maintaining healthy lakes is indisputable; leaving a vegetated buffer between a structure and a lake lessens the effect of development. In many cases, there is little or no difference in the lake water quality and shallow water habitat between undeveloped sites and developed sites with adequate buffers. However,

unlike other “lake rich” states in New England and the Midwest – including New Hampshire, Maine, Wisconsin and Minnesota – Vermont does not have a mandatory statewide approach to protecting the vegetated areas along lakes and ponds. Therefore, it is up to municipalities to adopt shoreland zoning regulations that are adequate enough to protect shoreland vegetation and thus protect the water quality and habitat of our lakes.

III. THE AUTHORIZATION AND OPPORTUNITY FOR SHORELAND PROTECTION

Zoning regulations are often used to limit the type, density, and location of development within resource protection areas. Section 4302 of the Vermont Planning and Development Act (24 V.S.A. Chapter 117) includes in its purpose “to identify, protect and preserve ... outstanding water resources, including lakes, rivers, aquifers, shorelands and wetlands.” Shorelands are “the lands being between the normal mean water level of a lake, pond, or impoundment exceeding 20 acres and a line not less than 500 feet nor more than 1,000 feet from such mean water level.” (10 V.S.A. § 1422).

The authorization for shoreland zoning is contained in 24 V.S.A. § 4414, which states that town shoreland regulations may:

- regulate the design and location of development;
- require the provision and maintenance of vegetation, including no net loss of vegetation;
- prevent and control stormwater runoff;
- regulate filling and adverse alterations to wildlife habitat areas;
- preserve and protect the habitat of terrestrial and aquatic wildlife;
- prevent and control water pollution; and
- promote open space and aesthetics.

Further authorization for shoreland zoning is found in 24 V.S.A § 4411(b)(3), which states that zoning bylaws can regulate, restrict or prohibit uses or structures at or near natural or artificial bodies of water, places of relatively steep slope or grade, and river corridors and buffers. A buffer, as defined in 10 V.S.A. § 1422, is “an undisturbed area consisting of trees, shrubs, ground cover plants, duff layer, and generally uneven ground surface that extends a specified distance horizontally across the surface of the land from the mean water level of an adjacent lake or from the top of the bank of an adjacent river or stream, as determined by the secretary of natural resources.” Towns that do not have zoning are also authorized to adopt freestanding bylaws to regulate development and use along shorelands (24 V.S.A. § 4424).

The clear intention of this far-reaching authorization is to provide numerous opportunities for towns to protect the water quality and habitat value of their lakes and shorelands from the negative impacts of poorly planned lakeshore development. As noted earlier, only about one-fifth of Vermont’s towns have regulations protecting buffers and requiring building setbacks adequate to protect their shorelands. The negative impacts of lakeshore development can largely be abated with shoreland buffer standards that require the retention of native vegetation and trees along the shore.

IV. TYPES OF SHORELAND DISTRICTS

Towns can use a variety of approaches when considering shoreland district zoning. The choice will depend on the characteristics of the area, such as existing development and steepness of slope, as well as zoning already in place. The following examples describe options that towns can utilize to protect their shoreland resources:

Shoreland Overlay District

A shoreland overlay district is best suited for towns that already have shoreland areas within another zoning district. An overlay district is a zoning district that is superimposed on an underlying zoning district. It is used to exclude unsuitable development and/or to impose resource protection standards within the overlay areas of the underlying districts. A shoreland overlay district is especially appropriate for shore areas along a lake where the underlying district standards have allowed development within the shoreland buffer.

The VLCT Model Lake Shoreland Protection District Bylaw can provide additional shoreland protection by imposing requirements and standards in addition to those in the underlying district(s). The model standards can be used to increase the level of shoreland protection by prohibiting further encroachment of existing structures into the shoreland buffer, and where appropriate as a mitigation measure, require the property owner to return mowed or cleared areas to a naturally vegetated state.

Separate Shoreland District

A separate shoreland district that prohibits unsuitable development and imposes resource protection standards could be the only zoning district in town and limited to a specific lake or lakes. It could also protect a segment on a single lake where different uses along portions of the shoreline can be promoted or restricted. A separate shoreland district surrounding a lake in town would differ from an overlay district in that it does not overlap with any other district. The model can provide comprehensive coverage for all lake shoreland within a town, shoreland around lakes of a certain size, a specific lake, or a particular shoreland segment of a single lake.

Towns should be careful when considering the creation of a single shoreland district along just one segment of a lake shoreline because it could be viewed as being overly restrictive to a few landowners. Often, a single lake is located in more than one town, and cooperation between towns is necessary to ensure impartiality. A separate shoreland district is most appropriate for towns planning to have – or for those that already have – relatively uniform ownership patterns and uses surrounding the lake or lakes to be zoned.

Shoreland Design Review District

Although design review districts are generally intended for significant historical or architectural parts of a community, a town can create a shoreland design control district for “other areas in which there is a concentration of community interest and participation.” (24 V.S.A § 4414(E)) A town could certainly substantiate the establishment of a municipal shoreland design review district based on the need for increased stormwater management. To meet this requirement, towns could choose to adopt low impact development design standards for new development within the shoreland design review district.

The VLCT Model Lake Shoreland Protection District Bylaw incorporates standards that require development to be set back at least 125 horizontal feet from all lakes. This distance includes the minimum Shoreland Buffer Resource Zone of 100 feet, plus an additional 25 feet to prevent incursion into the buffer zone during construction. The model also includes standards that require new development and redevelopment to conform to construction site stormwater control measures and low impact development design standards as recommended by the state in the most recent

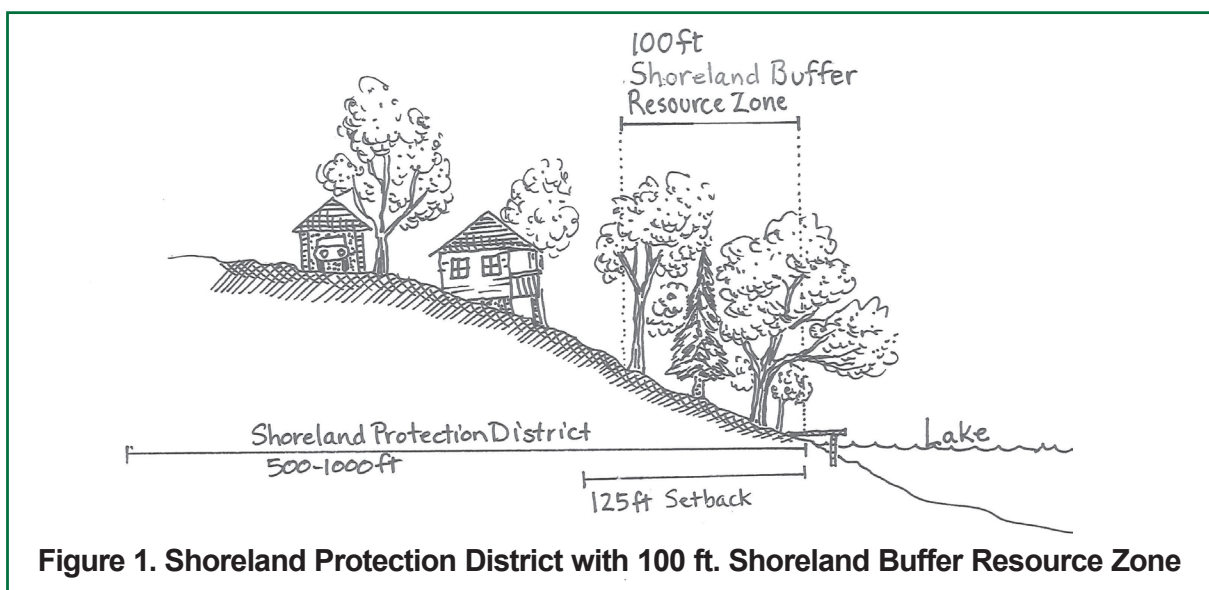


Figure 1. Shoreland Protection District with 100 ft. Shoreland Buffer Resource Zone

editions of the *Vermont Low Risk Handbook for Erosion Prevention and Sediment Control* and the *Vermont Low Impact Development Guide for Residential and Small Commercial Sites*. The total area of a lot covered by structures, driveways, parking areas, decks, patios, and other non-vegetated surfaces is limited to 20 percent within the Shoreland Protection District.

Shoreland Conservation District

A shoreland conservation district protects shorelands in a pristine or largely undeveloped state from development that would adversely affect scenic and natural values, productive habitat, wetlands, and/or water quality. A shoreland conservation district can include standards that protect undeveloped, fragile or scenic shorelands, wildlife habitat, and drinking water sources.

The VLCT Model Lake Shoreland Protection District Bylaw provides a template for a shoreland conservation district. However, if the town's goal is to prohibit development in undeveloped shoreland areas, it can impose more restrictive standards than those outlined in the model. For example, the size of the shoreland buffer can be increased from the model's recommended 100 feet, and the structure setback distance for development outside the buffer zone can be increased from 125 feet. The recommended minimum lot size of 20,000 square feet with a minimum lot shoreline frontage of 100 feet can be increased within the shoreland conservation district. The maximum impervious lot coverage can be decreased from the model's recommended 20 percent. (Impervious surfaces consist of any hardened surface such as asphalt, concrete, rooftops, driveways, and parking lots that do not allow water to infiltrate into the soil.) Rather than follow the model's recommended "grid and point system" to ensure a well-distributed stand of trees within the buffer, a town could prohibit all vegetation removal within the shoreland conservation district buffer zone.

Multiple Shoreland Districts

Depending on the characteristics of the area, a town can adopt more than one shoreland district on a particular lake. This may be particularly appropriate for a large lake with common existing land uses along its shoreline. For example, a Shoreland Conservation District could be established to protect existing wetlands, wildlife habitat, steep slopes, fragile or scenic areas, and low development areas. Next to the Shoreland Conservation District, the town could establish a Shoreland Recreational District to include recreational development such as campgrounds, picnic areas, beaches, and public boat access. On the more developed side of the lake where there are already recreational, commercial and residential uses, the town could establish a Shoreland Overlay District. Here the town could control the design and location of new development, incorporate standards that protect and reestablish vegetated shoreland buffers, and manage stormwater runoff.

Adopting a combination of shoreland protection district scenarios on a single lakeshore with widespread existing land uses is a suitable way to avoid the creation of a large number of non-conforming uses. Shoreland district regulations for lakes that are already so highly developed that zoning changes are likely to be ineffective should focus on standards that are more restorative than preventive. Permitting for non-conforming lots is more of an administrative burden than for conforming lots, and it is generally much easier to regulate future development than to correct past development. A town can utilize the VLCT Model Lake Shoreland Protection District Bylaw as a basis from which to choose permitted and conditional uses appropriate for each type of shoreland protection district along the shoreline of a particular lake.

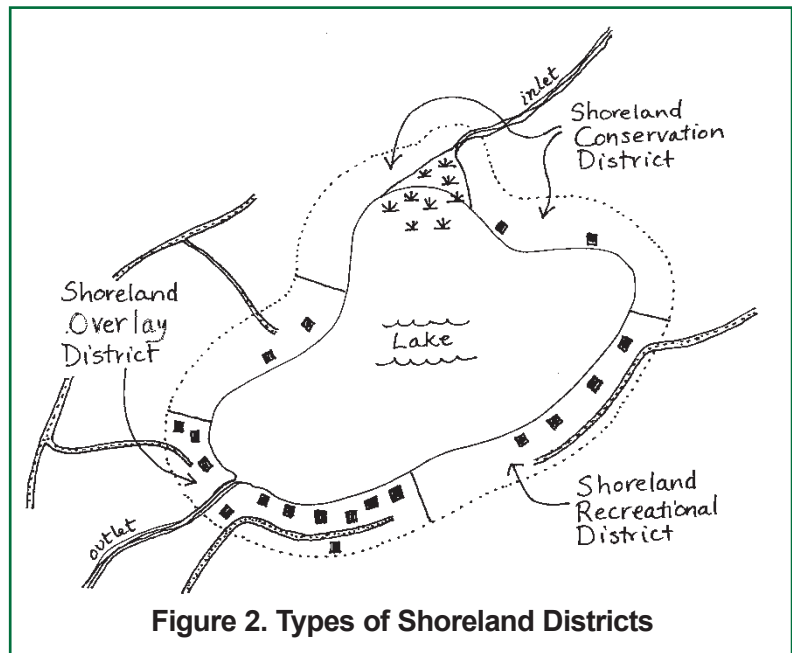


Figure 2. Types of Shoreland Districts

V. VLCT MODEL SHORELAND PROTECTION DISTRICT BYLAW

The VLCT Model Shoreland Protection District Bylaw includes standards relating to shoreland development concerns such as clearing restrictions, new uses, and nonconformities that are discussed below.

Managing Vegetation within the Shoreland Buffer Resource Zone

In the VLCT model, the Shoreland Protection District consists of the width of land measured horizontally from the mean water level to at least 500 feet from all lakes. The Shoreland Protection District incorporates the Shoreland Buffer Resource Zone, which includes the first 100 feet of the district.

Within the Shoreland Buffer Resource Zone, land owners can remove trees, limbs, saplings, and shrubs that pose safety hazards, as long as the ground cover and surrounding vegetation is not damaged and the duff layer and stumps are left intact. The duff layer is the layer of decomposed leaves, needles, twigs and other organic material found on the forest floor.

Limited clearing of healthy trees and saplings is allowed as long as it is managed with a grid-and-point system that ensures a well distributed stand of trees is maintained. The grid-and-point system developed by the Vermont DEC is similar to the point systems used in Maine and New Hampshire to maintain a minimum amount of tree and vegetation cover. Vegetation less than three feet in height, including ground cover and the duff layer, must not be removed. The grid and point system is recommended by the DEC because it provides a measurable and enforceable method for ensuring adequate vegetative cover while allowing some management of the trees and shrubs.

To administer the grid-and-point system, the Shoreland Buffer Resource Zone must first be divided into 25'x25' segments (1250 square feet). The trees within each segment are given points according to their diameter at 4.5' off the ground, commonly referred to as the diameter at breast height (DBH). At least 12 points must be maintained within each grid segment. Land owners may cut the trees or saplings, provided the sum of the points of the remaining trees for that segment is at least 12 points and any openings in the tree canopy is less than 250 square feet. The following table shows how points are assigned.

Land owners are not required to plant new trees to fulfill the 12-point tree coverage requirement on land within the Shoreland Buffer Resource Zone that was legally in existence prior to adopting the model language. However, land owners cannot decrease the point value of any grid section that does not meet the required 12-point score.

In order to administer the grid-and-point system, the grid segments must be marked at 25'x25' intervals. Start at the north or east property boundary line and measure 25' back from the lake-shore high water mark and 25' across the shoreland buffer. If the property line is straight, only the four corners of each segment need to be marked. If the property boundary is not straight or square, measuring smaller intervals may be necessary to determine accurate grid sections. Tree points in partial segments are proportional to the size of the segment.

The tree diameters are measured using a tape measure at a distance of 4.5' from the ground. This measurement is the circumference of the tree, which is converted to the diameter of the tree stem by using the calculation **Diameter = Circumference ÷ 3.1416**.

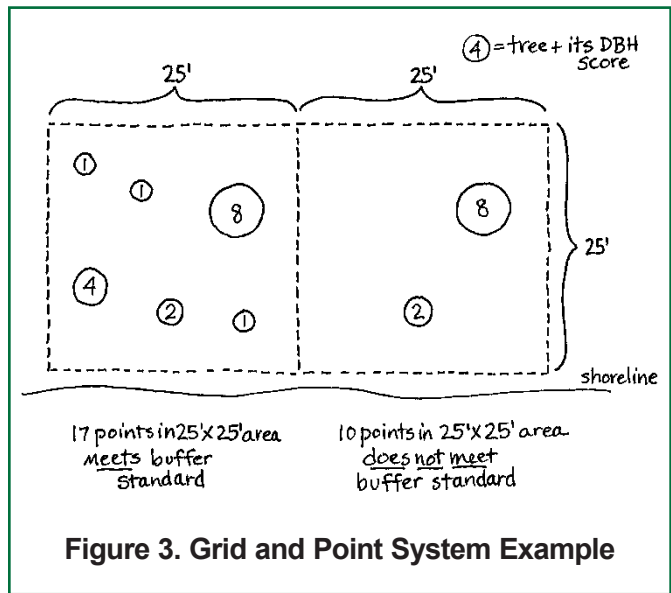
If a tree has multiple stems that begin at a point higher than the DBH or 4.5' feet from the ground, it counts as one tree. If the two stems begin below the DBH, the trunks are each measured at the DBH and the diameters are added together.

Diameter (DBH)	No. of Points
Under 2"	0
2" - < 4"	1
4" - < 8"	2
8" - < 12"	4
12" and greater	8

New Uses within the Shoreland Buffer Resource Zone

New uses within the Shoreland Buffer Resource Zone are limited to access footpaths that don't exceed six feet in width and stairways that don't exceed four feet in width. Paths and stairways must be constructed so as to prevent erosion, avoid soil disturbance, and disperse runoff into vegetated areas.

Any work involving fill, construction, sea walls, retaining walls, docks, rock toes, or moving stones beyond the mean water level will require a State Shoreland Encroachment Permit for the management of lakes and ponds. The goals of this permit program are to minimize the encroachment on public waters, and to ensure that the public good is not adversely affected and that projects are consistent with the state's Public Trust Doctrine. For details, see 29 V.S.A. Chapter 11, *Management of Lakes and Ponds*.



As discussed above, land owners may remove trees or saplings so long as they maintain an acceptable distribution of trees adequate to provide protection to the lake. The grid-and-point system describes the clearing limitations provided in the model.

New Uses within the Shoreland Protection District outside the Buffer

The model specifies that new development be set back at least 125 feet from all lakes. This distance includes the minimum Shoreland Buffer Resource Zone of 100 feet, plus an additional 25 feet to prevent incursion into the buffer zone during construction. If a town chooses a buffer with a width less than 100 feet, it is still important to include an additional setback of at least 25 feet to protect the buffer from construction activities.

Within the Shoreland Protection District outside the buffer, cleared openings are limited to no more than 25 percent of the lot area. The total lot area covered by structures, driveways, parking areas, deck, patios, and other non-vegetated surfaces is limited to no more than 20 percent of the lot area.

The model recommends the minimum lot shoreline frontage for new development in the Shoreland Protection District to be at least 100 feet, with a minimum depth of 200 feet. Landowners are prohibited from creating new lots that do not meet these minimum shoreline frontage and depth requirements. This is the minimum lot size that can allow the buffer and setback standards to be met. A lot that does not meet these minimum dimensions is non-conforming under the model.

Prior to site selection and design, the land owner must consider the extent of earthwork, erosion potential, and protection of critical features as well as the existing topography, existing drainage courses, vegetation and soil conditions. The model incorporates the best management practices for stormwater control recommended in the most recent edition of the Vermont Low Impact Development Guide for Residential and Small Sites. Development within the Shoreland Protection District must also adhere to basic erosion prevention and sediment control standards. The model incorporates the accepted management practices recommended in the most recent edition of *The Low Risk Site Handbook for Erosion Prevention and Sediment Control*.

The setbacks, lot dimensions, and coverage recommended in the model are appropriate for enabling medium-density residential shoreland development. Towns maintaining shorelands for recreational uses and/or conservation should have more restrictive district standards. For example, shoreland areas set aside to preserve or increase wildlife habitat could have a minimum 300-foot setback, including a buffer of at least 250 feet, and a minimum 400 foot shoreline frontage and depth requirement with maximum coverage of three percent.

Nonconforming Uses and Structures

“Nonconforming” is a term used to describe structures, lots, and uses that were legally in existence at the time of bylaw adoption but do not meet current bylaw standards. Local ordinances and bylaws are written, in part, with the aim of reducing nonconformities over time. There are, however, legal allowances for the continued use of nonconforming situations and for limited expansions of nonconforming structures. Generally, however, a nonconforming situation is not allowed to become *more* nonconforming.

In the case of shoreland development, nonconforming structures are usually buildings that predate the existence of the bylaw and are sited too close to the water. A typical nonconforming structure is a seasonal cabin that is partially or wholly within the current Shoreland Buffer Resource Zone setback area. Under the model, nonconforming structures can be repaired and maintained as long as no expansion occurs. The model does not permit any expansion, including decks or patios towards the water, if the structure is located within the Shoreland Buffer Resource Zone.

In situations where the overall situation would be improved, the Development Review Board/Zoning Board of Adjustment (DRB/ZBA) may allow a nonconforming structure to expand laterally into the Shoreland Buffer Resource Zone or the expansion of impervious surface coverage beyond 20 percent. (See mitigation section below.)

Cleared openings and lawns within the Shoreland Buffer Resource Zone are nonconforming uses that may be maintained. However, areas that were once fields, lawns, or cleared openings but have reverted to primarily shrubs, trees, or other woody vegetation become “no mow zones” and are subject to clearing restrictions within the Shoreland Buffer Resource Zone.

A shoreland property with a shoreline frontage less than 100 feet and/or a depth less than 200 feet is a nonconforming lot. The model specifies that nonconforming shoreland lots are not suitable for new development and land owners are prohibited from creating new lots that do not meet these minimum shoreline frontage and depth requirements.

The model specifies that any proposed new development on an existing lot made nonconforming because the minimum setback cannot be met, or the lot does not meet the minimum shoreline frontage and depth requirements, would have to go through the variance procedure found in 24 V.S.A. § 4469(a). State law allows variances to be granted only if all of the following five conditions are met:

- there are unique physical circumstances or conditions;
- because of these physical circumstances, the property cannot be developed in strict conformance with the bylaws;
- unnecessary hardship has not been created by the applicant;
- the variance will not alter the essential character of the neighborhood; and
- the variance represents the minimum alteration that will grant the relief requested.

Requests for variances may be common, but granting such requests should not be. It would be very difficult for an applicant to meet the variance criteria when proposing lakeshore development that encroaches upon the Shoreland Buffer Resource Zone.

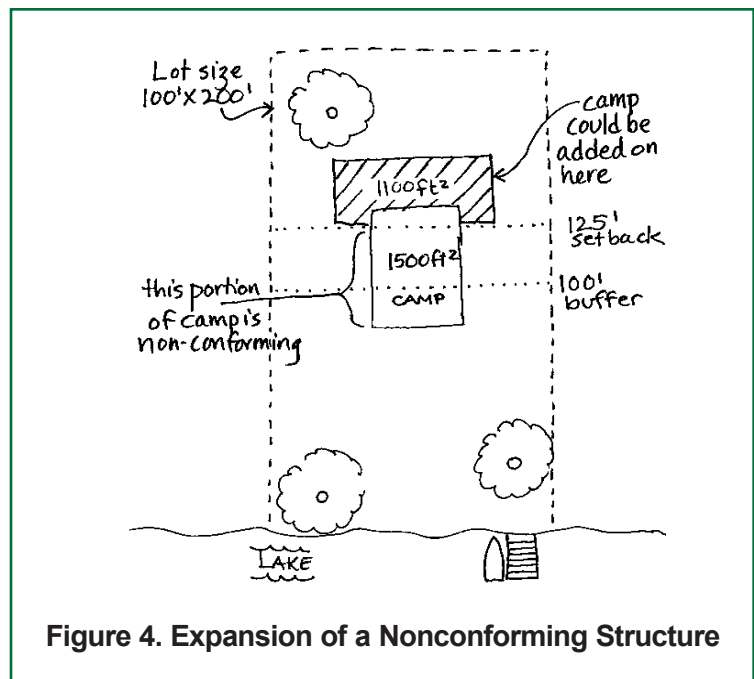


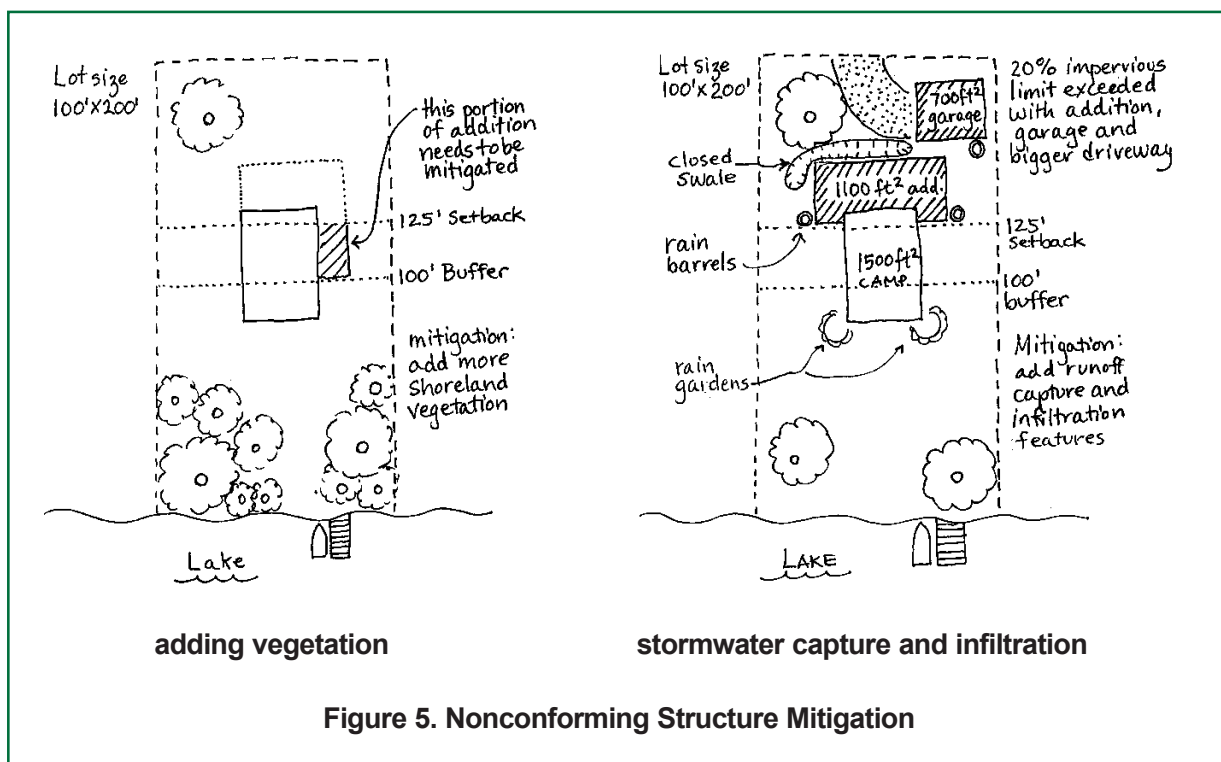
Figure 4. Expansion of a Nonconforming Structure

Mitigation

Mitigation is an action required of a shoreland property owner designed to compensate for shoreland buffer lost to impervious surfaces within the Shoreland Protection District. In circumstances where nonconforming structures are improved or expanded within the Shoreland Buffer Resource Zone, the DRB/ZBA may require the shoreland property owner to return any mowed or cleared areas to a naturally vegetated state with supplemental planting of appropriate native vegetation in order to restore the lakeshore buffer. The DRB/ZBA may allow an expansion that increases the impervious surface coverage to more than 20 percent within the Shoreland Protection District with an approved mitigation plan that includes runoff capture and infiltration structures to prevent stormwater runoff from reaching the lake.

Mitigation could be a useful tool for the DRB/ZBA when a property owner requests a variance for development on a lot made nonconforming due to shoreline frontage and/or depth dimension restrictions. As long as the resulting proposed development meets the five conditions for a variance required in 24 V.S.A. § 4469(a) listed above, the DRB/ZBA could approve the proposal contingent upon mitigation to restore or augment the shoreland buffer.

The DRB/ZBA is responsible for approving a shoreland property owner's proposed plan for mitigation. A mitigation plan could include measures such as buffer restoration, implementation of erosion and stormwater runoff controls, and removal of nonconforming or obtrusive accessory structures within the shoreland setback area. Additional site specific requirements can be determined by the DRB/ZBA before final plan approval, based on a review of site conditions and the need for any special buffer area protection or restoration measures.



VI. CONCLUSION

It's no mystery that lake shoreland property is highly sought after; water is a lure for human activity and lakeshores are particularly attractive as sites for recreation and residential development. But since shoreland development is typically associated with the loss of the natural shoreland woodlands and increased impervious surface areas, poorly planned shoreland development can adversely impact lake water quality and aquatic and riparian habitat. Clean water is an important part of your community's economy, shoreland property values, recreation and wildlife. Local municipal officials

can help abate the negative impacts of lakeshore development by adopting regulations that require vegetated buffers along lakes and ponds within their town.

The VLCT Model Lake Shoreland Protection District Bylaw provides municipalities a clear-cut framework that is simple to develop and administer. The lake shoreland protection model language can easily be incorporated into an existing land use regulation and can be adapted to meet the unique conditions of your community. For assistance, contact Milly Archer, Water Resources Coordinator, at the VLCT Municipal Assistance Center, 800-649-7015, or marcher@vlct.org. To access the online version of the model, please visit the VLCT Resource Library at <http://resources.vlct.org/>.

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References

- 29 V.S.A. Chapter 11 (www.leg.state.vt.us/statutes/sections.cfm?Title=29&Chapter=011)
- Vermont Low Impact Development Guide for Residential and Small Commercial Sites (www.vtwaterquality.org/planning/docs/pl_LID%20Guide.pdf)
- The Low Risk Site Handbook for Erosion Prevention and Sediment Control (www.anr.state.vt.us/dec/waterq/stormwater/docs/construction/sw_low_risk_site_handbook.pdf)
- Vermont DEC Water Quality Division Shoreland Encroachment Permits (http://www.anr.state.vt.us/dec/waterq/permits/htm/pm_encroachment.htm)
- Lake Protection Series (www.anr.state.vt.us/dec/waterq/lakes/htm/lp_protection.htm)
- Vermont DEC Water Quality Division Lakeshore Vegetation and Buffers (www.anr.state.vt.us/dec/waterq/lakes/htm/lp_shorevegandbuffers.htm)
- Vermont Agency of Natural Resources Riparian Buffer Guidance Document (www.anr.state.vt.us/site/html/buff/anrbuffer2005.htm)
- Maine Shoreland Zoning Handbook (www.maine.gov/dep/blwq/docstand/sz/citizenguide.pdf)
- Act 110 River Corridor Management and Lake Shoreland Management Programs Report to the General Assembly, Vermont DEC, January 2011 (www.leg.state.vt.us/reports/2011ExternalReports/265312.pdf)
- New Hampshire Homeowner's Guide to Stormwater Management (www.des.state.nh.us/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf)

ABOUT THE MAC TECHNICAL PAPERS

The Municipal Assistance Center began publishing its series of technical papers in 2007 to provide information on topics that need to be treated in more detail than a newsletter article, but less than a handbook. Papers previously issued are:

- #1. *Making It Stick: The Art of Writing Effective Zoning Decisions*, March 2007.
- #2. *Creating an Effective Riparian Buffer Ordinance*, April 2007.
- #3. *Creating a Development Review Board*, July 2007.
- #4. *On the Record Review*, February 2008.
- #5. *Managing Stormwater through Low Impact Development (LID) Techniques*, May 2008.