

MOULTONBOROUGH BAY INLET WATERSHED MUNICIPAL ORDINANCE REVIEW:

Moultonborough & Sandwich, New Hampshire



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FINAL REPORT

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INTRODUCTION

Land use and zoning ordinances are among the most powerful tools municipalities can use to protect their natural resources. FB Environmental Associates (FBE) is currently completing a Watershed-Based Management Plan (WBMP) for the Moultonborough Bay Inlet's 32,246-acre watershed. The watershed encompasses portions of the New Hampshire Towns of Moultonborough (21,882 acres) and Sandwich (10,364 acres).

A component of the WBMP includes an ordinance review for these towns. To determine how the two towns can improve their surface water protection measures, FBE conducted a review of the towns' existing land use and zoning regulations.

This report provides a review of the standards within the existing zoning ordinances within the project towns, and is predominantly focused on regulations as they relate to the quality of surface waters. Specific recommendations are provided within this report to inform the towns about how they can improve their ordinances so that they may better protect Moultonborough Bay Inlet and other surface waters. This report complements the Build-out Analysis (FBE, 2015a), Assimilative Capacity Analysis (LWA & FBE, 2015), Lake Loading Response Model (FBE, 2015b) and the Moultonborough Bay Inlet Shoreline Survey (FBE, 2016), completed as part of the Moultonborough Bay Inlet WBMP project.

These suggestions are targeted at improving regulations by enhancing protections for water quality, and we include references to relevant supplementary documents. The suggestions are presented in context and each suggestion is presented independent of the others, and should be considered on a case-by-case basis. By considering these recommended changes, the towns' Planning Boards will take an important step toward enhancing protections for their water resources.

PROJECTED DEVELOPMENT

FBE conducted a build-out analysis for the portion of Moultonborough within the Moultonborough Bay Inlet watershed in 2015. The build-out analysis provides estimates about the potential for new residential and commercial development, including the number of new buildings and the amount of land area that could be developed in the watershed based on current zoning standards (see FBE, 2015). Based on these current zoning standards, the build-out analysis estimates that 2,184 buildings could be added in the future, affecting the 5,253 acres of buildable land within the watershed.

SUMMARY OF NH SHORELAND ZONING STANDARDS

Moultonborough Bay Inlet is regulated under state-mandated shoreland zoning standards. Appendix A contains a summary of these regulations.

According to RSA 483-B, or the Shoreland Water Quality Protection Act (SWQPA), the protected shoreland pertains to all of the land within 250 feet from the shoreline (reference line) of the surface water, which includes:

- All lakes, ponds, and artificial impoundments greater than 10 acres in size.
- 4th order and higher rivers and streams and designated river segments.

Development within and alterations to the protected shoreland are regulated by the SWQPA, but municipalities can institute more stringent regulations (NHDES, 2016). The Shoreland Program at the New Hampshire Department of Environmental Services (NHDES) is responsible for reviewing shoreland permit applications and responding to written complaints documenting possible violations of the SWQPA. As within most state agencies today, the Shoreland Program has limited staff resources available to enforce regulations, such as the SWQPA. Therefore, the Shoreland Program depends on local officials and residents, such as code enforcement officers and engaged citizens, to report potential violations. Such reports aid the Shoreland Program in enforcing the regulations within the SWQPA.

The New Hampshire State Statutes within Chapter 483-B are available in full online at: www.gencourt.state.nh.us/rsa/html/nhtoc/nhtoc-l-483-b.htm.

IMPERVIOUS SURFACE AREA LIMITATION

If a homeowner or developer wishes to exceed 30% impervious surface coverage of the lot area within the protected shoreland, a stormwater management system designed and certified by a professional engineer that will not concentrate stormwater runoff or contribute to erosion must be implemented, and if any grid segment within the waterfront buffer does not meet a required 50-point tree, sapling, shrub, and groundcover score, each deficient grid segment must be planted with additional vegetation to at least achieve the minimum required score. If a homeowner or developer wishes to exceed 20% impervious area, a stormwater management plan must be implemented to infiltrate increased stormwater from development (NHDES, 2016).

NATURAL WOODLAND BUFFER LIMITATIONS

At least 25% of the area between 50 feet and 150 feet from the reference line must be maintained in an unaltered state (NHDES, 2016). Within 50 feet from the reference line, a waterfront buffer must be maintained. Within the waterfront buffer, tree coverage is managed with a 50 by 50-foot grid and point system. Trees and saplings may be removed provided the sum score of the remaining trees, saplings, shrubs, and groundcover within the affected grid segment is at least 50 points. No natural groundcover shall be removed except for a footpath to the water that does not exceed 6 feet in width and does not concentrate stormwater or contribute to erosion. Natural groundcover must remain intact. No cutting or removal of vegetation below 3 feet in height (excluding previously-existing lawns and landscaped areas). Stumps, roots, and rocks must remain intact in and on the ground unless specifically approved by NHDES (NHDES, 2016).

PRIMARY BUILDING SETBACK

All primary structures must be set back at least 50 feet from the reference line. Towns may maintain or enact greater setbacks.

TOWN ORDINANCES

The sections below compare ordinances between the two towns and sets forth regulatory recommendations and development techniques that can be used to protect water quality. Appendix A contains a table summarizing selected ordinances/development practices of the two towns.

PERCENT LOT COVERAGE

Impervious surfaces beyond a building's footprint, such as parking lots, driveways, and sidewalks increase the volume of stormwater runoff when it rains, as well as act as conduits for pollutants. Stormwater is a major environmental stressor and one of the leading causes of declining water quality (Shuster et al., 2008). When rainwater flows over impervious surfaces, it picks up a suite of pollutants, including sediments, oils, and nutrients, such as phosphorus and nitrogen, which in turn end up in streams, rivers, lakes, or the ocean.

The connection between increasing amounts of impervious cover within a watershed and degradation of water quality is well established (Peterson et al., 2009). Extensive science and engineering research shows that watersheds with high percentages of impervious cover have direct, negative impacts on hydrology and water quality (Flinker, 2010). Based on a review of hundreds of studies, Tom Schueler and others at the Center for Watershed Protection in Maryland developed what they called the "Impervious Cover Model." This model is based on the average percentages of impervious cover at which stream water quality declines. The model displays that streams become impacted when their watersheds have 10–25% impervious cover, and virtually all streams are impaired in watersheds with greater than 25% impervious cover (Schueler, 2000).

Moultonborough's zoning ordinance does not state lot coverage restrictions other than that which is mandated under the SWQPA. However, the Town's Stormwater Management Ordinance (Article XII of the Zoning Ordinance) calls for a Stormwater Management Plan to be submitted if subdivision of lot, commercial or multi-family development, or redevelopment disturbs 20,000 square feet or more of ground area. Furthermore, the ordinance states that there can be no negative impact to water quality post-development from pre-development conditions. In addition, for a 50-year storm, the post-development peak runoff rate and volume must not exceed pre-development amounts; pre-development groundwater recharge volume must be maintained post-development as well.

Sandwich's ordinance specifies that lot coverage may not exceed 50% in either the Commercial Zone or Village Zone. Within its Groundwater Protection District, any use that will result in greater than 15%

impervious cover in any lot must submit a stormwater management plan consistent with the New Hampshire Stormwater Manual Volumes 1-3 (McCarthy, 2008).

As Moultonborough's impervious cover requirements are more stringent (via its Stormwater Management Ordinance), it may prove beneficial in protecting water quality of Moultonborough Bay Inlet and other surface waters if Sandwich adopted standards similar or identical to those of Moultonborough.

BUILDING SETBACKS (SHORELAND ZONES)

The land adjacent to a lake, pond, river, or stream, when left in its natural state, can play an important role in filtering runoff, shading streams and rivers, protecting banks and shorelines, and reducing erosion. Some of the benchmark standards that should be built into ordinances for protecting water quality within the shoreland zone include: mandatory setbacks for primary structures, mandatory buffers between development and the waterbody, and impervious cover restrictions.

Moultonborough's required setback of 50 feet follows the State of New Hampshire's minimum requirement, as dictated by SWQPA. Sandwich goes beyond the State minimum and requires a setback of 100 feet in its Rural/Residential and Commercial zoning districts. This 100-foot setback has proven to be very effective (Merrell et al., 2013) and it may therefore be prudent for Moultonborough to adopt Sandwich's standards.

WETLAND BUFFERS

Wetlands provide many ecological, economic, and social benefits. They provide habitat for fish, wildlife, and a variety of plants. They are nurseries for many saltwater and freshwater fishes and shellfish of commercial and recreational importance. Wetlands are also important landscape features because they hold and slowly release flood water and snow melt, recharge groundwater, recycle nutrients, and provide recreation and wildlife viewing opportunities for the area's residents and visitors (EPA, 2016).

The State of New Hampshire, under RSA 482-A regulates a 100-foot buffer area on designated prime wetlands. The protections of all other wetlands within the State are under the jurisdiction of the municipality. Under the administrative rules Env-Wt 700, individual municipalities may elect to designate wetlands as "prime-wetlands." After a thorough analysis and a submission from the municipality, DES may choose to designate the wetland as a prime wetland (NHDES, 2016b).

Moultonborough's ordinance specifies a 50-foot setback from wetlands and that a naturally vegetated buffer be maintained within 25 feet immediately adjacent to applicable wetlands. Sandwich is one of the 33 towns in New Hampshire that has gone through the process of designating prime wetlands. State regulations dictate that 100-foot buffers apply to prime wetlands; as such, Sandwich has gone above the State's minimum standards for wetland protections in that it requires buffer areas for (almost) all wetlands.

As mentioned above, wetland regulations do not apply to *all* wetlands within each town. Moultonborough's ordinance applies to wetlands greater than 20,000 square feet (just less than ½ acre) in their entirety or wetlands of any size that are contiguous to a river, brook, lake, or pond with certain other exemptions (e.g.,

manmade ditches, detention basins). Sandwich's ordinance states wetlands less than 15,000 square feet in area that are not in direct surface contact with waterbodies may be disregarded in determining setback requirements.

Both towns may wish to eliminate their wetland size requirement, or perhaps not disregard setback requirements if a given small wetland is functioning as a vernal pool. Vernal pools are typically very small in size, but can be enormously productive wetlands.

For additional protection of wetlands and their water quality, Moultonborough might wish to increase its wetland buffers to 100 feet. Note, however, that this buffer size is based on protecting water quality, *not* wildlife (pool-breeding amphibians, in particular) that may inhabit some of the wetlands present in the towns. For guidelines on best development practices in regard to pool-breeding amphibians, see Calhoun and Klemens (2002) *Best Development Practices Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States* available online at:

www.umaine.edu/vernalpools/PDFs/Best%20Development%20Practices%20-%20-%20-%20Conserving%20Pool-breeding%20Amph.pdf

CONSERVATION SUBDIVISIONS

A conservation subdivision (a.k.a., open space subdivision, cluster subdivision) is a residential subdivision in which a substantial amount of the site remains undeveloped and is permanently protected as open space (NHDES, 2008). Homes are constructed, typically in a clustered fashion, on the remaining portion of the site. Within the Moultonborough Bay Inlet watershed, conservation subdivisions could be encouraged or mandated, as this type of development has been shown to have less negative impact on open space, wildlife and their habitat, and water quality than unlimited outward expansion of low-density development into undeveloped areas (i.e., sprawl; Hawkins, 2014).

Moultonborough's ordinance does contain a provision for conservation subdivisions (referred to as Multi-Family and Cluster Development in the ordinance). The town permits the clustering of housing units for the preservation of open space, to promote more efficient use of land, and to provide flexibility in subdivision design. The town does not require this type of development to take place as a result of certain circumstances; however, the provision itself is progressive in that it states that the total ground area occupied by buildings and parking areas may not exceed 20% of the total ground area of the development.

The Town of Sandwich also allows clustered development (referred to as Cluster Residential Development) as it: "permits greater flexibility in design; discourages development sprawls; provides a more efficient use of land in harmony with the land's natural characteristics; and preserves more usable open space, agricultural land, tree cover, recreational areas or scenic vistas". However, Sandwich's ordinance requires that only 25% of the property to be designated as permanent common open space.

Sandwich may wish to increase its open space requirement to a level similar to that of Moultonborough. Both towns may also wish to mandate conservation subdivisions in certain situations. For example, the New Hampshire Town of Effingham has a strong Open Space Conservation Subdivision ordinance in that its Planning Board may require an applicant to use an Open Space/Conservation Subdivision design if the property is 10 acres or more and contains certain features. Examples include prime agricultural land, rare, threatened, or endangered species or exemplary natural communities, or proximity to a great pond or perennial stream. The ordinance is progressive in that it calls for a 50% minimum of the overall property to be set aside as Conservation Area, and that these areas should be connected to nearby conservation areas, wherever possible. The Town of Wakefield also encourages conservation subdivisions if a given parcel contains certain natural features (e.g., agricultural land, endangered species) and mandates that a minimum of 50% of *buildable* land must be set aside as open space.

An issue noticed with both the Moultonborough and Sandwich ordinances is that conservation land can be conveyed to homeowner's associations. Homeowner's associations often don't have the expertise (or the interest) in managing conservation areas, and therefore, should not be charged with managing conservation land. Putting conservation land under easement with a local land trust is a much better option.

LOW IMPACT DEVELOPMENT

Low impact development (LID) refers to a wide range of techniques specifically designed to limit the adverse effects that poorly planned development can have on water quality. Some examples of LID techniques include minimization and/or disconnection of impervious surfaces, development design that reduces the rate and volume of runoff, and reduction of the pollutant loads within runoff. Common types of techniques include, but are not limited to: bioretention cells, tree box filters, infiltration trenches, rain barrels, and rain gardens. Municipalities can help protect water quality by mandating the use of LID in new and renovated developments. Since these practices are relatively new, most municipalities do not currently mandate the use of LID.

Neither Moultonborough nor Sandwich mentions LID in their zoning or conservation subdivision ordinances. Both towns should consider incorporating language into their ordinances mandating the use of LID techniques for developments which have the greatest potential to impact surface waters. This could include mandating that LID techniques be used for all new construction. More information on LID techniques can be found on the Center for Watershed Protection's website: www.cwp.org and within the New Hampshire Homeowners Guide to Stormwater Management available through NHDES:

www.des.state.nh.us/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf.

Several other New Hampshire communities have placed language for the use of LID requirements into their zoning ordinances to ensure stormwater pollutant removal. For example, the Town of Newbury discusses LID in their Stormwater Management ordinance, which states that the use of LID techniques is preferred and shall be implemented to the maximum extent possible (Newbury, 2013).

SUMMARY

This ordinance review for the Towns of Moultonborough and Sandwich analyzed the standards within the towns' ordinances pertaining to percent lot coverage, building setbacks, wetland buffers, conservation subdivisions, and low-impact development. This review provides the towns with information on how they can improve standards pertaining specifically to these topic areas. This was *not* a full-scale ordinance review. A full-scale ordinance review would require additional time and effort and would be an ideal project task for an implementation grant and would include directives for working with the municipal planning boards to recommend changes. Therefore, ordinance components, such as site plan review regulations, road and right of way standards, minimum lot sizes, minimum shore frontage per lot, and others, which have the potential to impact surface water quality, should also be carefully reviewed in the future.

Aside from their intrinsic value, the natural resources within the towns, the Moultonborough Bay Inlet, and its watershed, help to fuel the local economy. Ongoing efforts to protect and improve water quality is therefore an important consideration for the long-term sustainability of Moultonborough and Sandwich's local economy, and can be accomplished by the ongoing efforts of an active planning board, an informed and engaged citizenry, and regulations that allow well-planned development to occur with the least impact to the land and water in the towns.

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APPENDIX A. Summary table of reviewed town ordinances/development techniques.

ORDINANCE TOPIC	MOULTONBOROUGH	SANDWICH
Percent lot coverage (Shoreland)	Follows State standard. Subdivisions, commercial and multi-family developments, and redevelopments that disturb 20,000 square feet or more must submit a Stormwater Management Plan.	Follows State standard. Only specified for Commercial Zone and Village Zone – not to exceed 50%.
Building Setback (Shoreland)	50 feet (State standard).	100 feet in Rural/Residential and Commercial Zoning Districts.
Wetland Setback	50 feet. "A naturally vegetated buffer shall be maintained within 25 feet immediately adjacent to the applicable wetlands."	100 feet. However, "wetlands less than 15,000 square feet in area not in direct surface contact with water bodies may be disregarded."
Conservation/Cluster Subdivisions	Permitted. "The total ground area occupied by structures and required parking shall not exceed 20% of the total ground area of the development."	Permitted. "At least 25% of the cluster development shall be designated as permanent common open space."
Low Impact Development (LID)	Not mentioned.	Not mentioned.