

10.0 BUFFERS

Buffers are an important part of the Nordic Aquafarms project. The primary purpose of vegetated buffers is to protect water quality by minimizing the potential for soil erosion and sedimentation into site and surrounding water bodies. However, buffers also provide green space, create a visual screen, provide travel corridors for wildlife, and also protect wildlife habitat. The following sections described Nordic's goals and proposed plan for buffers at the site.

10.1 Objectives

Buffers are being designed and maintained on the site to:

1. Provide a natural means of sedimentation and erosion control;
2. Reduce the potential for site development to cause soil erosion;
3. Maintain wildlife corridors, particularly along existing streams; and
4. Provide visual screening, especially along areas defined in Section 6.0 as "public viewing areas".

10.2 Proposed Plan

Overall, the proposed project seeks to minimize the potential for the development to cause soil erosion by minimizing encroachment into buffers. This will be accomplished through reduced side slope grading where practicable. Side slopes of 2:1 are proposed adjacent to the Water/Wastewater Treatment Facility and Wetland 6. Side slopes of 1.5:1 along the entire length of the Grow Modules to the side of the project along Reservoir Number One are also being utilized to provide vegetated buffers, a travel corridor and to maintain setbacks. Additionally, riprap slopes adjacent to Wetland 2 are proposed to reduce encroachment into the wetland. Additional details on site grading and sediment and erosion controls are provided in Sections 12 and 14 of this application and the accompanying drawing sets.

The proposed project will maintain a 50-foot setback and a 40-foot, no-disturbance buffer in newly developed portions of the site, in accordance with City of Belfast ordinances. In addition, the project will maintain a 75-foot buffer from Route 1. So that the project may use the "open yard" concept for fire safety, up to 60 feet of additional setback from lot lines is proposed, leading to 100+ feet of buffer for most of the project site. This centralized building design will help maintain existing wildlife habitat and provide visual screening.

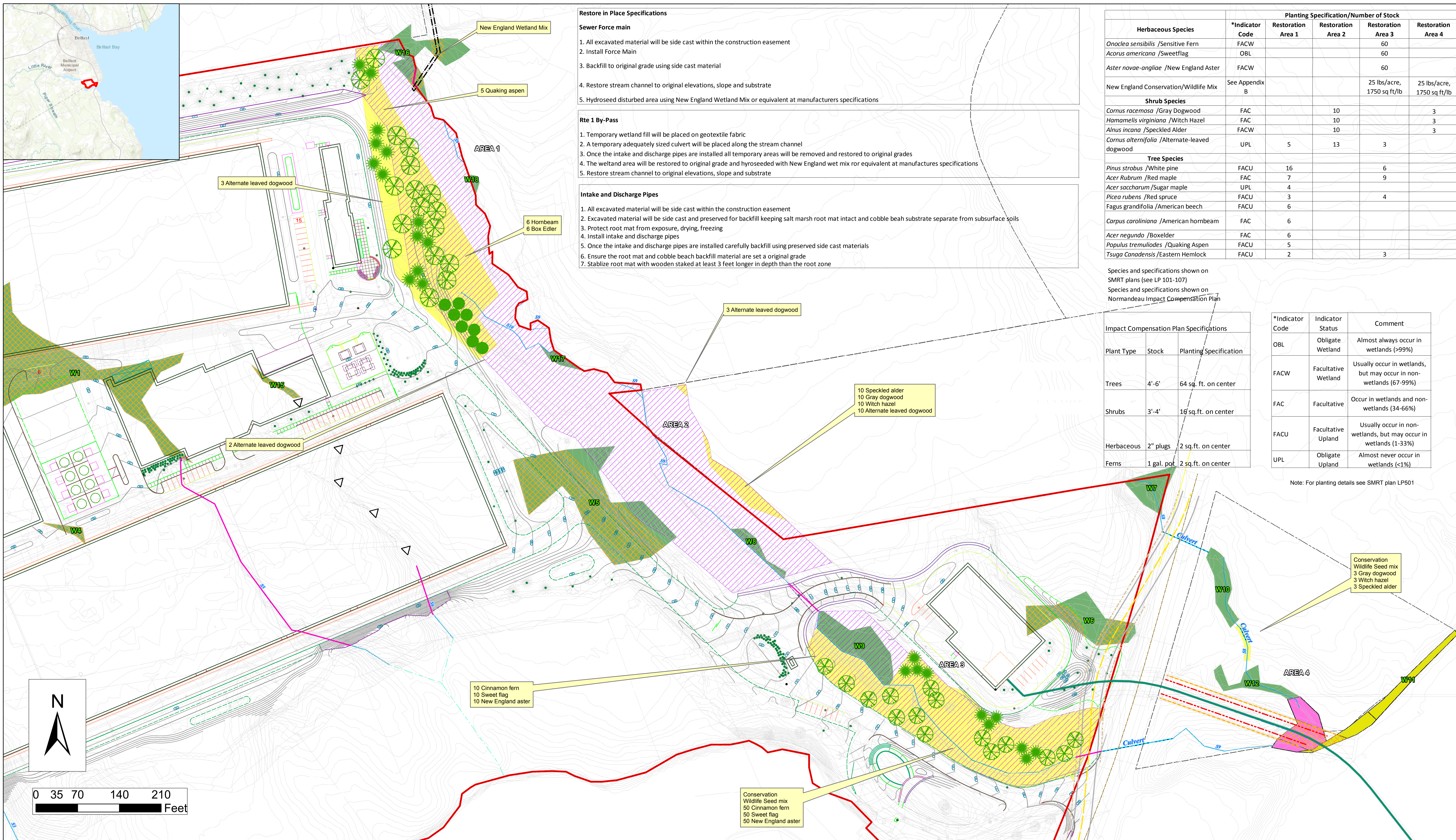
The slope along the northern property line will be revegetated with a mix of evergreen and deciduous trees to enhance the buffer between the site and the neighboring properties. The intent is to naturalize this and other areas that are disturbed and otherwise not part of stormwater treatment and return them to predevelopment vegetated conditions. A mix of plant sizes and types will be used to emulate existing species diversity. A restoration seed mix will be used to stabilize the immediate ground surface and allow larger species to take hold. Additional planted screening is proposed at the southeast corner of the site. Areas with high visual interest and visibility including the main entrance will be planted with flowering accent trees, low shrubs, and ornamental grasses.

As part of the wetland impact mitigation proposal included in the NRPA permit application that accompanies this permit application, the project is maintaining a minimum 75-foot deeded buffer along the stream named S9 as shown on **Figure 10-1**. Also, S9 is the focus of the riparian restoration plan which extends beyond the 75-foot deeded buffer, providing as much as 150' between the stream and

project development in some locations. The riparian restoration and deeded buffer will create quality wildlife habitat and a travel corridor along S9. Plantings proposed as part of the site restoration plan and to enhance visual screening for the project are shown on plans **LP101**, **LP101a**, **LP102**, and **LP 107**.

A 250-foot Shoreland Zone abuts the southern portion of the project site. The Belfast community has utilized a trail along the shore of the Lower Reservoir and the Little River within this Shoreland Zone for recreation (hiking, dog walking), and the land provides a valuable linkage between the project site and the larger area of wildlife habitat on the Upper Reservoir parcel of land to the northwest. As part of the real estate agreement between the Belfast Water District and Nordic Aquafarms included in Section 2.0, the 250' buffer along the Lower Reservoir and the Little River abutting the project site will remain with the City of Belfast. The transfer of land back to the community will preserve a significant 250-foot buffer on the southern and western boundaries of the proposed project, in addition to the 100+ feet of buffer described above. Access to riparian habitat and significant water bodies will help meet the goals of the project by linking site buffers with the larger portions of land preserved by the City of Belfast, while also providing an approximately 350-foot buffer from the edge of the reservoir and Little River to the proposed site buildings.

In summary, Nordic's centralized building layout includes a number of buffers imposed on the property that serve to protect water quality, create visual screening and, provide for and protect wildlife habitat and travel corridors. Some encroachment into the buffers is required to support the project infrastructure; however, areas of encroachment have been either avoided where possible or minimized where practicable.



Restore in Place Specifications

Sewer Force main

1. All excavated material will be side cast within the construction easement
2. Install Force Main
3. Backfill to original grade using side cast material
4. Restore stream channel to original elevations, slope and substrate
5. Hydroseed disturbed area using New England Wetland Mix or equivalent at manufacturers specifications

Rte 1 By-Pass

1. Temporary wetland fill will be placed on geotextile fabric
2. A temporary adequately sized culvert will be placed along the stream channel
3. Once the intake and discharge pipes are installed all temporary areas will be removed and restored to original grades
4. The wetland area will be restored to original grade and hydroseeded with New England wet mix or equivalent at manufacturers specifications
5. Restore stream channel to original elevations, slope and substrate

Intake and Discharge Pipes

1. All excavated material will be side cast within the construction easement
2. Excavated material will be side cast and preserved for backfill keeping salt marsh root mat intact and cobble beach substrate separate from subsurface soils
3. Protect root mat from exposure, drying, freezing
4. Install intake and discharge pipes
5. Once the intake and discharge pipes are installed carefully backfill using preserved side cast materials
6. Ensure the root mat and cobble beach backfill material are set a original grade
7. Stabilize root mat with wooden staked at least 3 feet longer in depth than the root zone

Herbaceous Species	*Indicator Code	Planting Specification/Number of Stock			
		Restoration Area 1	Restoration Area 2	Restoration Area 3	Restoration Area 4
<i>Onoclea sensibilis</i> /Sensitive Fern	FACW			60	
<i>Acorus americana</i> /Sweetflag	OBL			60	
<i>Aster novae-angliae</i> /New England Aster	FACW			60	
New England Conservation/Wildlife Mix	See Appendix B			25 lbs/acre, 1750 sq ft/lb	25 lbs/acre, 1750 sq ft/lb
Shrub Species					
<i>Cornus racemosa</i> /Gray Dogwood	FAC		10		3
<i>Hamamelis virginiana</i> /Witch Hazel	FAC		10		3
<i>Alnus incana</i> /Speckled Alder	FACW		10		3
<i>Cornus alternifolia</i> /Alternate-leaved dogwood	UPL	5	13	3	
Tree Species					
<i>Pinus strobus</i> /White pine	FACU	16		6	
<i>Acer Rubrum</i> /Red maple	FAC	7		9	
<i>Acer saccharum</i> /Sugar maple	UPL	4			
<i>Picea rubens</i> /Red spruce	FACU	3		4	
<i>Fagus grandifolia</i> /American beech	FACU	6			
<i>Carpus caroliniana</i> /American hornbeam	FAC	6			
<i>Acer negundo</i> /Boxelder	FAC	6			
<i>Populus tremuloides</i> /Quaking Aspen	FACU	5			
<i>Tsuga Canadensis</i> /Eastern Hemlock	FACU	2		3	

Species and specifications shown on SMRT plans (see LP 101-107)
 Species and specifications shown on Normandeau Impact Compensation Plan

Impact Compensation Plan Specifications		
Plant Type	Stock	Planting Specification
Trees	4'-6'	64 sq. ft. on center
Shrubs	3'-4'	16 sq. ft. on center
Herbaceous	2" plugs	2 sq. ft. on center
Ferns	1 gal. pot	2 sq. ft. on center

*Indicator Code	Indicator Status	Comment
OBL	Obligate Wetland	Almost always occur in wetlands (>99%)
FACW	Facultative Wetland	Usually occur in wetlands, but may occur in non-wetlands (67-99%)
FAC	Facultative	Occur in wetlands and non-wetlands (34-66%)
FACU	Facultative Upland	Usually occur in non-wetlands, but may occur in wetlands (1-33%)
UPL	Obligate Upland	Almost never occur in wetlands (<1%)

Note: For planting details see SMRT plan LP501

Figure 10-1
**Belfast Aquaculture Project
 Impact Compensation Plan**

- Sewer Easement
- Temp US1 bypass
- Project Area
- Palustrine Wetlands
- SMRT Tree Symbol Lines
- Edge of Pavement
- Deeded Riparian Buffer
- Salt Marsh
- Stream Impact
- Fog Line
- Wetland Impact
- Cobble Beach
- Current Pipeline Route
- Centerline
- Restoration Area
- Intermittent Stream
- Easement Centerline
- Existing Culvert
- Other Belfast Parcels
- Permanent Easement 25' Wide
- Intermittent Stream
- Hydrologic Connection
- Temporary Easement 40' Wide
- Stream Not Field Delineated

