



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

October 17, 2024

Parterre Ecological/Parterre Garden Services
Shana Hostetter
14 Braintree St.
Portland, ME 04103

RE: Variance permit for CMR 01-026 Chapter 29, Parterre Ecological/Parterre Garden Services

Greetings,

The Board of Pesticides Control considered your application for a variance from Chapter 29. The variance is approved, provided that all products to be used are currently registered in the State of Maine or were registered at the time of purchase and that any application is made above the high-water line.

The Board authorizes the issuance of two-year permits for Chapter 29, therefore this permit is valid until December 31, 2025, as long as applications are consistent with the information provided on the variance request. Please notify the Board in advance of changes, particularly if you plan to use a different product from those listed.

Please bear in mind that your permit is based upon your company adhering to the precautions listed in Section X of your Chapter 29 variance request.

I will alert the Board at its next meeting that the variance permit has been issued. If you have any questions concerning this matter, please feel free to contact me at 287-2731.

Sincerely,

Alexander Peacock
Director

ALEXANDER PEACOCK, DIRECTOR
90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-2731
THINKFIRSTSPRAYLAST.ORG

**BOARD OF PESTICIDES CONTROL
APPLICATION FOR VARIANCE PERMIT
(Pursuant to Chapter 29, Section 6 of the Board's Regulations)**

I. Shana Hostetter (717) 587-5355
Name Telephone Number
Parterre Ecological
Company Name
3 Stonecliff Road, Biddeford, Maine, 04005
Address City State Zip

II. Shana Hostetter CMA-6371
Master Applicator (if applicable) License Number
14 Braintree Street, Portland, Maine, 04103
Address City State Zip

III. **As part of your application, please send a revegetation plan and digital photos showing the target site and/or plants and the surrounding area, particularly showing proximity to wetlands and water bodies, to pesticides@maine.gov**

IV. Area(s) where pesticide will be applied:
See Attached Land Management Plan for more details. We will apply pesticides in the 'wild spaces' at the Abenakee Golf Club. There are approximately 12 acres of wild spaces that have varied levels of invasive plant species intermingled in within the native vegetation. The largest swath of 'wild space' is coastal and contains a wetland.

V. Pesticide(s) to be applied:(Including EPA Registration Number)
Round Up Custom, 524- 343
Garlon 3A, 62719-37

VI. Purpose of pesticide application:
To control invasive plant species in the 'wild spaces' at the Abenakee Club.

VII. Approximate dates of spray application:

November 2024 - November 2026

VIII. Application Equipment:

Cut Stump Application (Buckthorn Blaster), Backpack Sprayer, Hand-held Foamer

IX. Standard(s) to be varied from:

Chapter 29, Section 6, Section A

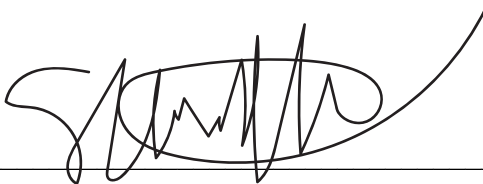
X. Method to ensure equivalent protection:

When using backpack sprayer we will be using large droplet sizes to minimize drift. We will only apply herbicide when the wind is less than 15mph. Spray only when ground is dry and not saturated with water. Avoid spraying when forecasts show a threat of heavy rains. Do not spray on rainy days and cease spray operations if rain is in the immediate forecast.

XI. Revegetation Plan (attach separately if necessary)

See attached Land Management Plan

Signed:



Date: 10/11/24

Return completed form to: **Board of Pesticides Control, 28 State House Station, Augusta, ME 04333-0028**
OR E-mail to: pesticides@maine.gov

LAND MANAGEMENT PLAN

A NARRATIVE FOR INVASIVE MANAGEMENT & NATIVE PLANT RESTORATION



View of the Lower Wet Area and Beach Edge

ABENAKEE GOLF CLUB • BIDDEFORD POOL, MAINE



PROJECT INTRODUCTION

This plan addresses a proposed invasive management and restoration planting at the Abenakee Golf Club located at 2 Stone Cliff Road in Biddeford Pool, Maine. There is about 12 acres of wild space on this golf course. Most of that acreage is buffer space between the greens of the golf course and the coast. There is a smaller section of wild space called 'The Pit,' and a 20-30' strip that borders the Audubon's property.

Over all the wild spaces are densely vegetated with woody trees and shrubs, although there are pockets of mowed meadow. There is significant invasive plant pressure in these wild spaces especially along the edges. The interior of the largest swath of wild space does contain a wetland. This area seems to be minimally invaded and consists mostly of native species. See Appendix B for more details.

The invasive population on site is mature and self-perpetuating. These species will inevitably displace the remnant native population unless decisive action is taken. These invasives include common culprits such as privet, bittersweet, honeysuckle, barberry, Norway maple, sycamore maple, and a very small patch of Japanese Knotweed.

Knotweed is the most aggressive of invaders, and one that requires aggressive and immediate means of control. Luckily, there is only a small and very manageable patch currently. Immediate action should be taken to control that patch before it takes hold and creates a bigger problem.

The purpose of this plan is to identify the invasives plants we propose to remove, provide a description of each, and detail best management practices for control and management. The plan also includes a narrative for proposed native restoration, specifies plant species and delineates planting methods.

Finally, it provides a detailed maintenance calendar for all aspects of proposed management and ecological restoration over an extended timeline.

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ABENAKEE CLUB GEOGRAPHY & GOALS

The Abenakee Club is situated in the middle of the Biddeford Pool peninsula. The property borders Wood Island Harbor to the north, the Audubon Sanctuary and the East Point Sanctuary is to the east, and residential properties make up the southern and western borders. Most of the property consists of manicured greens for playing golf. About 12 acres of the property are wild spaces that contain wetlands, uplands, sandy coastlines, shrublands, and meadows. There is a mix of native and invasive plant vegetation. The invasive plants are mostly concentrated on the edges of the wild spaces and are starting to dominate the native ecosystems that are present. The goal of this Land Management Plan is to present an inventory of the native and invasive species, identify the level of invasive plant pressure, share our Invasive Plant Management strategies, and propose native species to replace the removed invasives if necessary.



- Property Boundary of the Abenakee Golf Club
- Wild Spaces Where Invasive Plant Management Will Occur



EXISTING CONDITIONS: INVASIVE PLANT IMAGES



'The Pit' is starting to be dominated by bittersweet, honeysuckle and barberry.



Small patch of knotweed located on the path toward the coast.(Path to Beach)

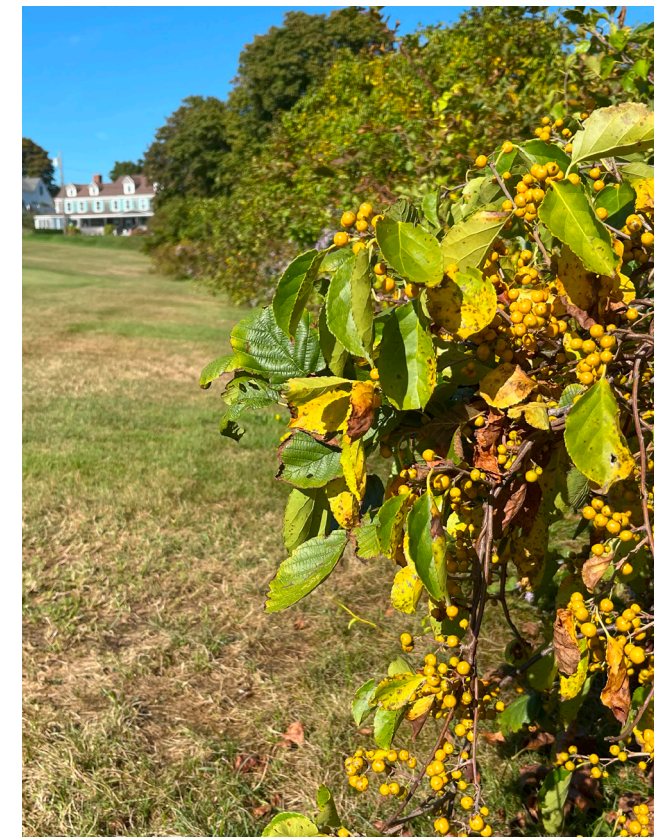


There are several large invasive trees like Norway maples and sycamore maples on site. These trees will continue to grow bigger and produce offspring that will start to dominate the overstory. (Lookout Tower Area)

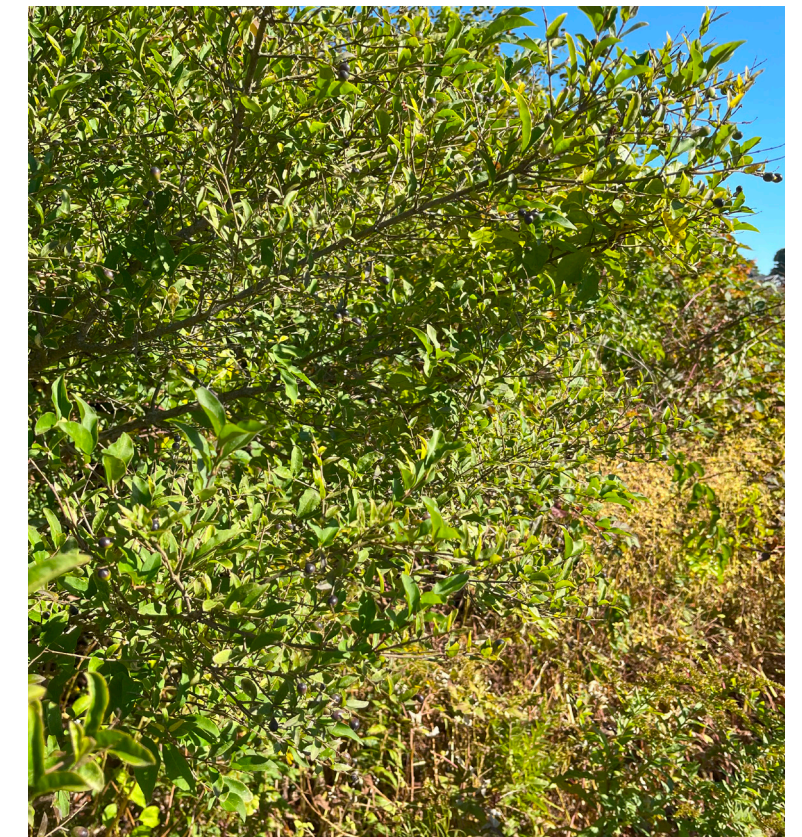
EXISTING CONDITIONS: INVASIVE PLANT IMAGES



Bittersweet is one of the most prolific invasive species on site. It is seen here dominating the native alders, willows and asters. (Lower Wet Area)



Bittersweet is producing fruit on the wild edge along the course. (Lower Wet Area)



Privet has escaped from the hedge planted by the tennis courts and has taken hold in some of the wild spaces. (Lower Wet Area)

EXISTING CONDITIONS: INVASIVE PLANT IMAGES



Honeysuckle growing along the coast. (Beach Edge)



Bittersweet along the property line that borders residential properties. (Residential Edge)

EXISTING CONDITIONS: INVASIVE SPECIES INVENTORY

Upland Area

Invasive Pressure: Medium to High
Edges worse than interior

INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES
Lonicera sp. (Shrub Japanese Honeysuckle)
Celastrus orbiculatus (Asiatic Bittersweet)
Acer platanoides (Norway Maple)

HERBACEOUS PLANTS

Solanum dulcamara (Bittersweet Nightshade)
Rubus phoenicolasius (Wineberry)

Upper Meadow

Invasive Pressure: Low
Area appears to be mowed frequently

INVASIVES/UNDESIRABLE NON-NATIVES:
WOODY VINE
Celastrus orbiculatus (Asiatic Bittersweet)

Beach Edge

Invasive Pressure: Medium to High
INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES
Ligustrum sp. (Privet)
Rosa rugosa (Rugosa Rose)
Lonicera sp. (Bush Honeysuckle)
Celastrus orbiculatus (Asiatic Bittersweet)

HERBACEOUS PLANTS

Solanum dulcamara (Bittersweet Nightshade)

Lower Wet Area

Invasive Pressure: Medium-High
Edges worse than interior

INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES
Trees/Shrubs/Woody Plants
Celastrus orbiculatus (Asiatic Bittersweet)
Ligustrum sp. (Privet)
Acer platanoides (Norway Maple)

HERBACEOUS PLANTS

Convolvulus arvensis (Field Bindweed)
Lythrum salicaria (Purple Loosestrife)
Rubus phoenicolasius (Wineberry)
Securigera varia (Crown Vetch)
Cirsium arvense (Canada Thistle)

Path to Beach

Invasive Pressure: Medium to High
Edges worse than interior
INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES
Acer platanoides (Norway Maple)
Lonicera sp. (Shrub Japanese Honeysuckle)
Celastrus orbiculatus (Asiatic Bittersweet)
Rosa rugosa (Rugosa Rose)

HERBACEOUS PLANTS

Fallopia japonica (Japanese Knotweed)

Lookout Tower Area

Invasive Pressure: Low
INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES
Lonicera sp. (Shrub Japanese Honeysuckle)
Ligustrum sp. (Privet)
Celastrus orbiculatus (Asiatic Bittersweet)
Acer platanoides (Norway Maple)

The Pit

Invasive Pressure: Medium
INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES
Celastrus orbiculatus (Asiatic Bittersweet)
Lonicera sp. (Shrub Japanese Honeysuckle)
Berberis vulgaris (Barberry)

HERBACEOUS PLANTS

Rubus phoenicolasius (Wineberry)
Artemisia vulgaris (Mugwort)
Securigera varia (Crown Vetch)

Residential Edge

Invasive Pressure: Spotty, low
INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES
Lonicera sp. (Shrub Japanese Honeysuckle)
Ligustrum sp. (Privet)
Celastrus orbiculatus (Asiatic Bittersweet)
Solanum dulcamara (Bittersweet Nightshade)



EXISTING CONDITIONS: NATIVE PLANT IMAGES



Bayberry, goldenrod and asters growing in a mowed area of the wild spaces at the Abenakee Club. (Upper Meadow)



Above: High bush cranberry fruiting in the fall.
Below: Winterberry shown here along the edge of the wild space and golf greens. (Lower Wet Area)



Black willow and pussy willow are prominent along the lower wet areas of the wild spaces. (Lower Wet Area)

EXISTING CONDITIONS: NATIVE PLANT IMAGES



Staghorn sumac with pitch pine in the distance. (The Pit)



Little Bluestem naturalizing in meadow areas. (The Pit)



Bayberry and Virginia rose intermingling on the edge of the wild areas. (Lookout Tower Area)

EXISTING CONDITIONS: NATIVE SPECIES INVENTORY

See map on page 7 for location of zones

Upland Area

*Invasive Pressure: Medium to High
Edges worse than interior*

NATIVES:

TREES/SHRUBS/WOODY VINES

Prunus sp. (Cherry)
Pinus strobus (White Pine)
Crataegus sp. (Hawthorn)
Rhus typhina (Staghorn Sumac)
Amelanchier sp. (Serviceberry)
Sorbus americana (Mountain Ash)
Viburnum trilobum (Cranberrybush Viburnum)
Spiraea alba (Meadowsweet)
Rubus sp. (Raspberry, Blackberry, etc.)
Myrica pensylvanica (Bayberry)
Rosa sp. (Native Roses)

HERBACEOUS PLANTS

Solidago sp. (Goldenrods)
Euthamia sp. (Grass-leaved Goldenrod)
Symphyotrichum sp. (Asters)

Upper Meadow

*Invasive Pressure: Low
Area appears to be mowed frequently*

NATIVES:

TREES/SHRUBS/WOODY VINES

Myrica pensylvanica (Bayberry)
Prunus sp. (Cherry)
Spiraea alba (Meadowsweet)
Vaccinium angustifolium (Lowbush Blueberry)
Viburnum dentatum (Arrowwood Viburnum)
Toxicodendron radicans (Poison Ivy)

HERBACEOUS PLANTS

Solidago sp. (Goldenrods)
Euthamia sp. (Grass-leaved Goldenrods)
Rubus sp. (Dewberry)
Achillea millefolium (Yarrow)
Fragaria virginiana (Wild Strawberry)
Rubus sp. (Blackberry)

Residential Edge

*Invasive Pressure: Spotty, low
Mostly ornamental plants.*

Lower Wet Area

*Invasive Pressure: Medium-High
Edges worse than interior*

NATIVES:

TREES/SHRUBS/WOODY VINES

Salix discolor (Pussy Willow)
Salix sp. (Willow)
Acer rubrum (Red Maple)
Ilex verticillata (Winterberry)
Cornus racemosa (Gray Dogwood)
Alnus sp. (Alder)
Viburnum trilobum (Cranberrybush Viburnum)
Parthenocissus quinquefolia (Virginia Creeper)

HERBACEOUS PLANTS

Symphyotrichum sp. (Asters)
Impatiens capensis (Jewelweed)
Typha sp. (Cattail)
Rubus sp. (Raspberry, Blackberry, etc.)
Euthamia sp. (Grass-leaved Goldenrod)
Solidago sp. (Goldenrods)

Path to Beach

*Invasive Pressure: Medium to High
Edges worse than interior*

NATIVES:

TREES/SHRUBS/WOODY VINES

Viburnum trilobum (Cranberrybush Viburnum)
Alnus sp. (Alders)
Cornus sericea (Redtwig Dogwood)
Viburnum dentatum (Arrowwood Viburnum)
Ilex verticillata (Winterberry)

HERBACEOUS PLANTS

Onoclea sensibilis (Sensitive Fern)
Symphyotrichum sp. (Asters)
Carex sp. (Sedges)
Impatiens capensis (Jewelweed)

Beach Edge

Invasive Pressure: Medium to High

NATIVES:

TREES/SHRUBS/WOODY VINES

Amelanchier sp. (Serviceberry)
Populus tremuloides (Quaking Aspen)
Quercus rubra (Red Oak)
Prunus sp. (Cherry)
Viburnum dentatum (Arrowwood Viburnum)

HERBACEOUS PLANTS

Symphyotrichum sp. (Asters)
Solidago sempervirens (Seaside Goldenrod)

Lookout Tower Area

Invasive Pressure: Low

NATIVES:

TREES/SHRUBS/WOODY VINES

Myrica pensylvanica (Bayberry)
Prunus sp. (Cherry)
Spiraea alba (Meadowsweet)
Juniperus communis (Common Juniper)
Rosa sp. (Roses)
Amelanchier sp. (Serviceberry)
Vaccinium corymbosum (Highbush Blueberry)

HERBACEOUS PLANTS

Solidago sp. (Goldenrods)
Symphyotrichum sp. (Asters)

The Pit

Invasive Pressure: Medium

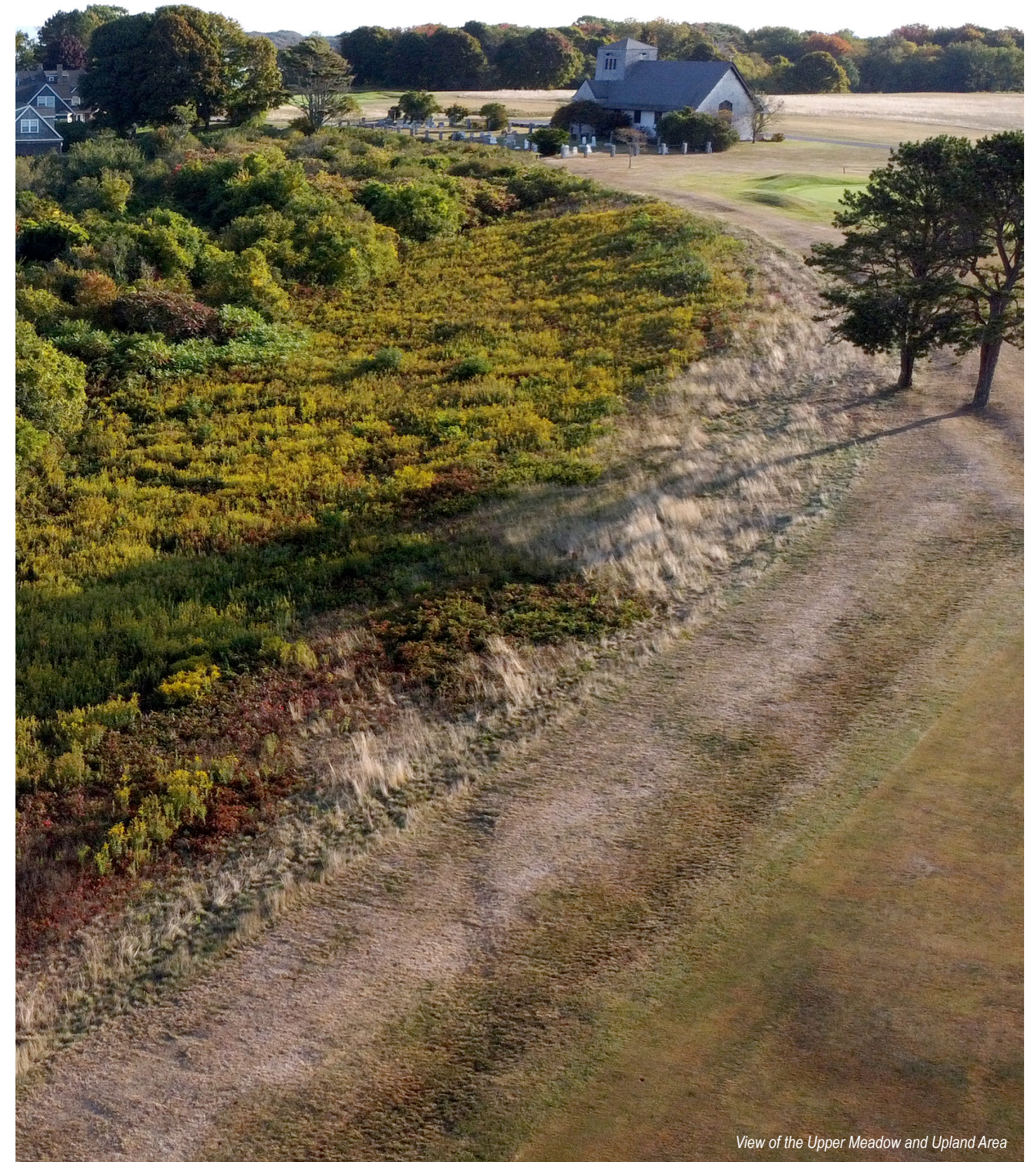
NATIVES:

TREES/SHRUBS/WOODY VINES

Comptonia peregrina (Sweet Fern)
Myrica pensylvanica (Bayberry)
Toxicodendron radicans (Poison Ivy)
Rhus typhina (Staghorn Sumac)
Salix sp. (Willow)
Amelanchier sp. (Serviceberry)
Spiraea alba (Meadowsweet)
Betula populifolia (Gray Birch)
Rosa sp. (Roses)
Quercus velutina (Black Oak)

HERBACEOUS PLANTS

Solidago sp. (Goldenrods)
Schizachyrium scoparium (Little Bluestem)



View of the Upper Meadow and Upland Area

PROPOSED GENERAL INVASIVE MANAGEMENT TECHNIQUES

MANUAL HAND REMOVAL METHODS:

Manual methods of invasive plant management - including hand pulling and cutting - will be prioritized whenever possible. For tenacious woody plants, use of a weed-wrench is recommended. To minimize soil disturbance (which can activate invasive seed banks), only shallow-rooted invasive plants less than 1" in caliper should be hand pulled from the soil. Invasive plant species greater than 1" caliper are best cut and treated. Invasive plant material will be disposed of off site, chipped and spread, or piled discreetly in the woods as habitat piles.

MECHANICAL MANAGEMENT:

Mechanical methods of invasive control include mowing, string-trimming, and sawing down of single large specimens or extensive stands of a particular plant. In a few cases repeated mowing or cutting is all that is needed to weaken a plant's resources to the point of die-off. With most aggressive invasives however, mowing and cutting are only the first step in a more intensive program plan that involves selective herbicidal treatments.



Hand pulling invasives will be prioritized.



Mechanical mowing of a dense stand of phragmites.

PROPOSED GENERAL INVASIVE MANAGEMENT TECHNIQUES

CUT AND DAB TREATMENT:

All invasive plant species that have a base greater than 1" in caliper will be addressed with herbicide application. Invasive plants of this size usually have extensive fibrous root systems which provide beneficial soil stabilization and are best left in situ. Unfortunately, they also maintain the ability to resprout, which is why we propose a cut and dab method with Garlon 3A™ (a triclopyr-based herbicide) on individual cut stumps. Licensed Herbicide Applicators will complete all treatments.



Licensed applicators with required Personal Protective Equipment paint the stems of invasive species after cutting.

FOAM APPLICATION:

Some invasives, particularly persistent herbaceous plants like Japanese Knotweed, or resprouting woodies, are best managed with a foliar foam application. This technique allows the technician to systematically target the new green growth of a plant, where herbicide is absorbed most effectively. The foam adheres to the foliage and the herbicide is trans-located through the vascular system of the plant. Foliar foam wipes are best performed in late summer to fall when the plant is actively reserving energy in the rootstock.



Licensed applicators with required Personal Protective Equipment paint the stems of invasive species after cutting.

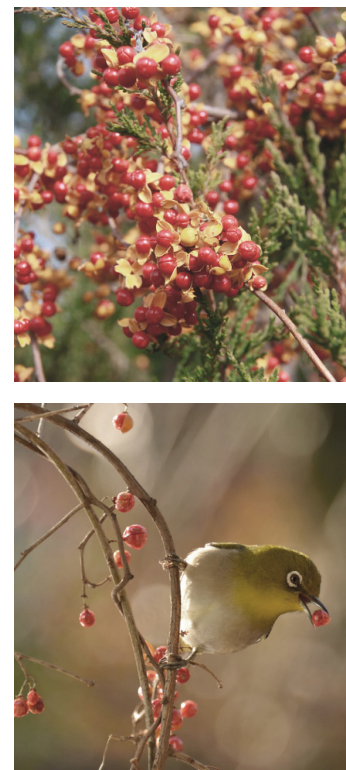
SPECIALIZED INVASIVE MANAGEMENT TECHNIQUES: ASIATIC BITTERSWEET



Invasive Bittersweet (*Celastrus orbiculatus*) has the capacity to girdle, weaken, and even kill mature canopy trees. Without consistent management, vines will eventually open large holes in the canopy while suppressing saplings from filling the gaps. They readily resprout after being cut and can damage the aesthetic and ecological value of meadows and forests alike.



Removing the entire vines from trees is often dangerous and unnecessary (unless it poses safety risk). Best management practice involves making cuts at shoulder height followed by a cut at 12" and immediate herbicide treatment. Bittersweet aggressively suckers after cutting so it is important to cut and treat during or after its flowering period (late June to December).



Established vines produce thousands of bright red berries that mature in late fall and are spread by birds.

SPECIALIZED INVASIVE MANAGEMENT TECHNIQUES: JAPANESE KNOTWEED

Japanese Knotweed (*Fallopia japonica*) is one of the most difficult invasive species to control. Its main mode of spreading is through cut portions of its rhizomes or stem, which can actively resprout from a 1" fragment. Growing 10-15' and often shading out any competitors, Japanese Knotweed can quickly form a monoculture, especially along waterways and wetland edges.



Identification: Herbaceous perennial, with long heart shaped leaves and hollow stems. Young sprouts can be red.

Knotweed flowers in late August and early September.

Unfortunately, knotweed roots can extend over 6' below the ground making organic treatment nearly impossible. Even so, it can take 2-5 seasons to fully control it through repeat herbicide treatments. These are best undertaken during August and September when the plant is in its weakest stage and nutrients are flowing back into the roots. There are two ways to approach treatment.



1. Cut and treat: For small patches, cut the stem between the 1st and 3rd node and add a 50% solution of a wetland-approved herbicide such as Aquaneat™ (glyphosate), generally 5 oz per treated stem. If density is < 5 ft per plant treat every third stem. Do this for 2-5 seasons.

2. Cut in May, with a foliar or stem application of herbicide in late summer. Best practice for dense mature stands of knotweed. The May mowing or cutting causes the knotweed to regrow to a more manageable height in the late summer, at which point the leaves can be easily painted with a 6.0% Aquaneat (glyphosate) solution before the plant pulls its nutrients back into the roots in preparation for winter.

RESTORATION PLANTING RECOMMENDATIONS

Restoration planting will happen once a substantial amount of the Invasive Plant Management has occurred. In the areas where the invasive plant pressure is low, we recommend letting the existing native plants creep in and take over. Where the invasive plant pressure is moderate or high, we recommend replanting with native trees, shrubs, or perennials based on the soil type and sun exposure.

For example, the areas along the Beach Edge can be naturally re-vegetated with neighboring native plants. However, the edge of the Lower Wet Area is heavily invaded with bittersweet. Once that bittersweet is removed, large gaps in the shrub layer will most likely be present. That would be a place where we would recommend replanting with native shrubs suitable to that area. See following page for examples of native trees, shrubs and perennials that we would recommend being planted in the wild areas of the Abenakee Club.



Aster novae-angliae (New England Aster) and Solidago spp. (Goldenrod) taking up space in a meadow. These would make great additions to a native meadow at the Abenakee Club as we manage out invasive vines like bittersweet.

UPLAND SHRUBS		<i>Rosa virginiana</i> Virginia Rose		<i>Aronia melanocarpa</i> Black Chokeberry		<i>Diervilla lonicera</i> Northern Bush Honeysuckle		<i>Myrica pensylvanica</i> Northern Bayberry		
	WETLAND SHRUBS		<i>Ilex verticillata</i> Winterberry		<i>Salix discolor</i> Pussy Willow		<i>Clethra alnifolia</i> Summersweet		<i>Sambucus canadensis</i> American Elderberry	
		SMALL TREES		<i>Amelanchier canadensis</i> Serviceberry		<i>Betula papyrifera</i> Paper Birch		<i>Prunus pennsylvanica</i> Fire Cherry		<i>Craetegus mollis</i> Downy Hawthorn
			PERENNIALS		<i>Asclepias syriaca</i> Common Milkweed		<i>Panicum virgatum</i> Switchgrass		<i>Pycnanthemum tenuifolium</i> Mountain Mint	

NATIVE RESTORATION TECHNIQUES: PLUGS AND POTS

Many native herbaceous perennials and grasses are best installed as plugs, quarts, or even 1-gallon specimens for the more immediate coverage, impact, and stabilization they provide. They can be used to establish an herbaceous layer entire or overlaid in a matrix on a newly-seeded area. Container plants also allow for the creation of drifts and masses of plants in a way that simple seeding cannot. Planted correctly, their roots will quickly expand, stabilizing soils and creating an understory of healthy native vegetation.

PLANTING PLUGS

- » Plugs and container plants are small, with compact root systems, and must be kept moist at all times. Water thoroughly two to three hours before planting. This also facilitates laying out as the roots will not be as liable to desiccate.
- » Determine the spacing of the plugs. Dependent on species and container size, this could range anywhere from 8" to 3' on center, in a grid formation. If massing species together, take care to put taller varieties towards the "back" of the meadow or plot; shorter plants in "front".
- » Planting holes will be dug with a variety of tools - trowels, picks, soil knives, shovels, even augers, mechanical or otherwise (especially useful in highly compacted soil). The plug's or plant's crown should sit at soil level and be gently tamped down around its base. Water immediately, and continue to water on a regular basis the first year of establishment.
- » Mulch helps conserve soil moisture and reduces weed pressure. We recommend 2" of shredded leaf mulch immediately after planting.
- » Whole plants will fill in more quickly than seeded areas, but weed pressure may still be high. Be vigilant in maintenance.



Plugs and container plants will have dense root systems that must be kept moist.



NATIVE RESTORATION TECHNIQUES: SEEDING DISTURBED SOILS

RESTORATION SEEDING

- » The first step in seeding is a thorough site evaluation. Environmental factors such as sun exposure, soil type, topography, grade, and existing vegetation must all be considered. These attributes determine the native plant community best suited for the area.
- » The second very crucial task is management of existing invasive species. This can be done through manual and mechanical means, or through the targeted and elective use of herbicides.
- » Prepare the site for sowing and planting. Clear off leaves and debris, pick up twigs and sticks, and scarify the soil surface in preparation for sowing.
- » Hand-broadcasting seed is the preferred method in delicate wetland soils. Plugs and container plants can be installed at the same time or can be planted once the seedlings have emerged.
- » Finally, mulch the area after sowing. Mainly Mulch® protects germinating seeds while providing room for them to emerge. Thick wood chips, sawdust, or other bulky mulches will not be used.
- » A three-year maintenance plan is recommended to ensure greatest success. If a newly seeded installation is managed intensively and responsibly during its establishment, it will become self-regulating and require very little to no maintenance in the future.



Clear the space of debris



Seed mixes can be hand broadcast if the space is small enough to permit it.






Newly seeded meadow with straw mulch.



MANAGEMENT CALENDER FOR TREATMENT AND PLANTING

TASK	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Hand removal woody seedlings < 1" caliper	Optimal	Optimal	Optimal	Optimal	Optimal	Possible	Possible	Possible	Possible	Possible	Possible	Possible
Hand pulling herbaceous species	Possible	Possible	Optimal	Optimal	Optimal	Possible	Possible	Possible	Optimal	Optimal	Possible	Possible
Mechanical management of woody	Optimal	Optimal	Optimal	Optimal	Optimal	Possible	Possible	Possible	Possible	Possible	Possible	Possible
Cut and dab herbicide on woody invasives	Possible	Possible	Possible	Possible	Possible	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal
Japanese Knotweed Cutback	Possible	Possible	Possible	Optimal	Optimal	Optimal	Possible	Possible	Possible	Possible	Possible	Possible
Japanese Knotweed Chemical Treatment	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Optimal	Optimal	Optimal	Possible	Possible
Restoration: Seeding	Possible	Possible	Optimal	Optimal	Optimal	Possible	Possible	Possible	Optimal	Optimal	Optimal	Optimal
Restoration: Planting	Possible	Possible	Possible	Optimal	Optimal	Optimal	Possible	Possible	Optimal	Optimal	Possible	Possible
Restoration: Live staking	Optimal	Optimal	Optimal	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Optimal	Optimal

-  Optimal timing and efficiency
-  Not optimal but mostly effective
-  Possible, but not ideal

The timing of various containment and restoration strategies is critical to their success. Fortunately, the calendar provides ample opportunity for action at any time of the year. Tasks should be performed by trained ecological technicians and licensed herbicide applicators. These recommendations for restoration take into consideration the long term health of the Abenakee Club. Once invasive plants have been managed in a particular area, the restoration of native species should begin.

PROPOSED MANAGEMENT, RESTORATION & MAINTENANCE SCHEDULE

WINTER 2024 - 2025

- » Systematically remove woody invasive plants according to priority (determined by Abenakee Club and Parterre Eco).
- » Apply herbicide to freshly cut stumps (if seasonally applicable).

SPRING 2025

- » Continue to remove invasive woody plants from wild areas.

EARLY TO MID SUMMER 2025

- » Cut and control Japanese Knotweed.
- » Repeat cut and dab herbicide application to any resprouting invasive tree, shrub, and vine species.
- » Hand pull any invasive seedlings less than 1" in diameter; stem treat invasive perennials and remove seed heads.

MID SUMMER TO FALL 2025

- » Monitor plant response and continue hand pulling and herbicide application methods on resprouting invasive plant species.
- » Apply spray or foam herbicide application to herbaceous invasive plants two times during growing season.

ONGOING MAINTENANCE AND MONITORING:

- » After the treatments up until this point, the management plan should be evaluated. If treatments have been successful, only monitoring and minimal hand removal need be continued to keep invasive plant species at bay. Native trees, shrubs, and herbaceous forbs should dominate the minimally invaded areas.
- » Once the bulk of the heavier invaded areas are treated several times, a plan to re-vegetate with native restoration planting should be devised and implemented in the Summer of 2026.

APPENDIX A: INVASIVE PLANT PAGES

NORWAY MAPLE *ACER PLATANOIDES*



DESCRIPTION:

Acer platanoides, Norway Maple is a tree occurring in all regions of the state in upland and wetland habitats. It is especially common in urban areas. It grows in full sun to shade. It out-competes native vegetation, including sugar maple, *Acer saccharum* which it is frequently confused with. Norway autumn color is yellow, while Sugar is orange/red. Norway has white sap, while Sugar has clear sap in the petiole (stems). Norway maple leaf points reduce to a fine "hair", while the tips of the points on Sugar leaves are rounded.



HABITAT:

Norway maple is well adapted to various soils, grows in dry conditions, and can tolerate areas of soil pollution. Norway maples were widely planted in the United States as street trees and have escaped to natural habitats. Trees produce large numbers of seeds that are wind dispersed and invade natural areas, displacing native trees. Quickly establishing, they create a canopy of dense shade that prevents regeneration of native seedlings. May be alleopathic (capable of inhibiting neighboring plants' growth). Norway Maple produces copious amounts of seeds, and multitudes of seedlings can be found even one mature tree,



MANAGEMENT:

Manual methods of hand-pulling seedlings is recommended. For larger saplings, a 'Weed Wrench' is effective. Girdling the tree by cutting through the bark (cambium) layer all around the trunk is also an option as is basal bark treatment with a Triclopyr-based herbicide. Girdling is most effective in spring and should include reducing the canopy for safety, but consider leaving trunks for habitat value.

JAPANESE BARBERRY *BERBERIS THUNBERGII*

DESCRIPTION:

Japanese Barberry, or *Berberis thunbergii*, makes a dense, deciduous shrub understory that grows to 8 feet. Branches are brown, deeply grooved, zigzag in form and bear a single sharp spine at each node. The leaves are small ($\frac{1}{2}$ to $1\frac{1}{2}$ inches long), oval shaped, green, bluish-green, or dark reddish purple. Flowering occurs from mid-April to May in the northeast. Pale yellow flowers about $\frac{1}{4}$ in. Across hang in umbrella-shaped clusters of 2-4 flowers along the length of the stem. The fruits are bright red berries about $\frac{1}{3}$ " long that are borne on narrow stalks. They mature during late summer and fall and persist through the winter.

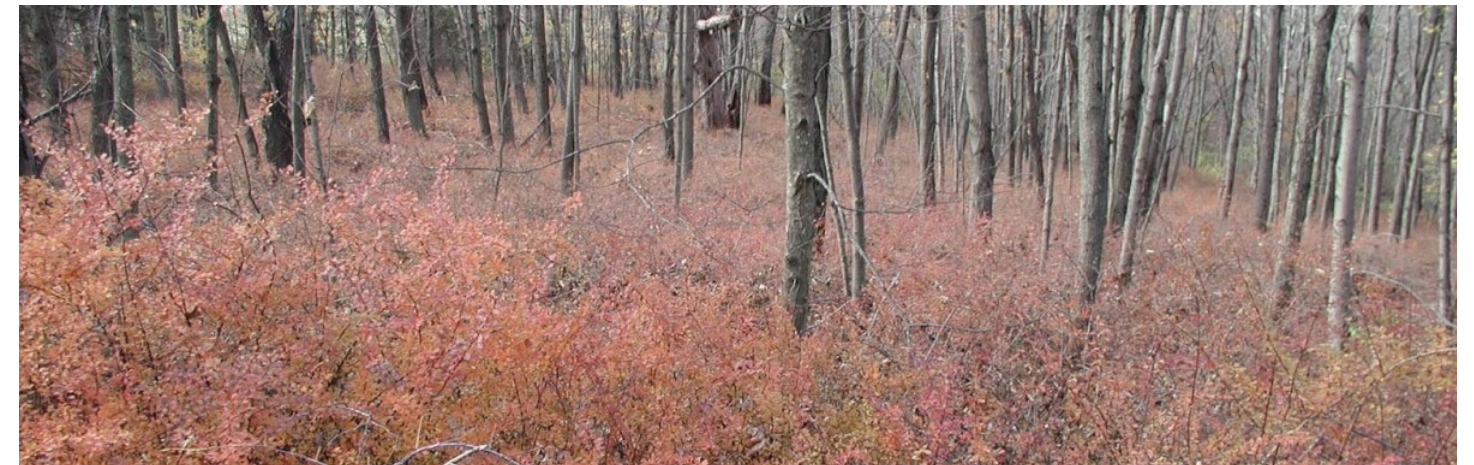


HABITAT:

Japanese Barberry is shade tolerant, drought resistant, and adaptable to a variety of open and forested habitats, and disturbed areas. It prefers to grow in full sun, but will flower and fruit even in heavy shade. There is also strong research to support the surprise benefit of controlling Japanese Barberry in the reduction of black legged (or deer) tick populations.

MANAGEMENT:

Japanese Barberry is produces seed prolifically, and with a high germination rate, so removal of fruiting branches is high priority. However, barberry also spreads by rhizome, so underground root fragments should be removed. Manual methods of hand pulling sprouts works well in small populations, but large populations may require chemical applications by applying a solution of glyphosate to foliage, or a triclopyr-based solution to cut stumps.



ORIENTAL BITTERSWEET

CELASTRUS ORBICULATUS



DESCRIPTION:

Celastrus orbiculatus, Asiatic Bittersweet is a deciduous climbing vine common in areas of disturbance in our New England forests. It has glossy, rounded leaves that are alternate with finely toothed margins. The leaves turn yellow in the fall. The fruiting plants produce small greenish flower clusters from leaf axils that mature in fall to produce high numbers of fruiting seed. The seed are noticeably yellow, globular capsules that split open at maturity to reveal red-orange fruiting seeds. Roots are also distinctly orange.



HABITAT:

Bittersweet spreads easily into forest edges, woodlands, unmanaged meadows and old fields. Most disturbed sites that are not being actively managed that receive full sun are susceptible. The vine can tolerate shade but is often found in more open, sunny areas.

MANAGEMENT:

Small seedlings can be hand pulled, but bittersweet resprouts prolifically from root fragments, so more aggressive measures need to be taken on all specimens but the very smallest. For established plants, vines should be cut to ground to reduce mass, but repeat cuttings will promote resprouting roots and should be avoided in most cases. Rake any seeds present, bagging in plastic bags, tying, and disposing of correctly.



JAPANESE KNOTWEED

FALLOPIA JAPONICA



DESCRIPTION:

Fallopia japonica, or Japanese knotweed is an herbaceous perennial which was originally imported from Asia as a garden specimen. This relatively short, shrub-like plant forms large dense clumps that measure between 3-10 feet high and as wide as the space permits. It rarely reproduces by seed but instead relies on its large rhizomes which may reach a length of 15-18' feet. The stems are green tinged with reddish pink in, ridged, jointed and hollow. It is often confused with bamboo. The large heart-shaped leaves are alternate on the stem, with red venation. The white plumed flowers appear in late summer. It invades a wide variety of habitats and forms dense stands that crowd out other plants. It is especially pervasive on streambanks where its perennial roots do little to inhibit erosion while crowding out preferred native woody vegetation.

HABITAT:

Japanese knotweed often invades disturbed sunny sites, and is often found along roadsides and especially stream banks and shorelines. However, it also tolerates deep shade, mesic soils, heat and salinity. Reproduction occurs primarily both by its extensive rhizomes but has also been known to reproduce from cuttings, which makes it a challenge to eradicate.



MANAGEMENT:

If possible hand cut large stands early in the year so that the resprouting stalks will be more manageably-sized. Then apply a glycosophate-based solution to resprouted leaves during late summer flowering. Any portions of the root system not removed or killed by herbicide will potentially re-sprout, so follow up applications will be necessary to control population. See Sheet 15 for details.



MORROW'S HONEYSUCKLE

LONICERA MORROWII



DESCRIPTION:

Lonicera morrowii, Morrow's honeysuckles are upright, deciduous shrubs that typically have a multi-stem mounding appearance. Oval leaves are opposite along the stem with smooth edges (no teeth or lobes) and hairy on the underside. Mature stems are often hollow on the interior and peeling on the outer bark. In the spring pairs of fragrant, tubular flowers less than an inch long are borne along the stem in the leaf axils. The fruits are red to orange, and fleshy.

HABITAT:

Honeysuckles are relatively shade-intolerant and usually colonize forest edges, abandoned fields, and other open, upland habitats. Grazed meadows and disturbed woodlands are especially vulnerable. Woodlands and open meadows, especially those that have been grazed or otherwise disturbed and are left unmanaged are also highly susceptible. Morrow's Honeysuckle are highly adaptable and can grow in even challenging environments such as roadsides and wetland edges.



MANAGEMENT:

Honeysuckle management can combine mechanical mowing and manual hand pulling with cut and dab herbicide treatments. Small specimens may be removed manually as honeysuckle root systems are fairly shallow. Root resprouting can persist for a few years and several seasons of management may be required to fully control the population.

APPENDIX B: FB ENVIRONMENTAL WETLAND DETAILS



TO: Robert Searle, Golf Course Superintendent, Abenakee Club
FROM: Kevin Ryan, FB Environmental Associates
SUBJECT: Site Reconnaissance – Biddeford Pool, Maine
DATE: January 10, 2023
CC: Forrest Bell, FB Environmental
Attachments: 1) Cowardin Wetland Classification System 2) Site Reconnaissance Map; 3) Site Photographs

As requested by the Abenakee Club, FB Environmental Associates, LLC (FBE) conducted natural community reconnaissance at the Abenakee Club golf course property in Biddeford Pool, Maine. The specific Survey Area is an approximately 10-acre portion of a 50-acre parcel associated with the Abenakee Club's golf course (see attached map). FBE Ecological Services Division Lead and Senior Wetland Scientist Kevin Ryan, PhD, conducted the field investigation on 8 November 2022.

WETLAND AND TERRESTRIAL RECONNAISSANCE METHODOLOGY

Approximate boundaries of wetlands and terrestrial (i.e., non-wetland) cover types encountered during the survey were geo-located using a handheld GPS unit (Garmin GPSMAP 78) which is typically accurate to within 30 feet. Although cursory, the delineation of hydrologic features within the project area was based on the protocols described in the 1987 USACE Wetlands Delineation Manual¹ and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0². This methodology involves identifying wetlands based on three criteria: the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. For a given area to be considered a wetland, all three of these parameters must be met, with some exceptions for disturbed areas.

All wetlands were classified using the Classification of Wetlands and Deepwater Habitats of the United States³ (Attachment 1). This water resource classification system was developed by the United States Fish and Wildlife Service (USFWS) and is commonly referred to as "Cowardin Classification". The Cowardin Classification is used to define wetlands and other aquatic resources by their landscape position, cover type, and hydrologic regime. Special modifiers can be added that describe water regime/chemistry, soil types, or disturbances.

WETLANDS OF SPECIAL SIGNIFICANCE

In Maine, Wetlands of Special Significance (WoSS) are regulated by the Maine Department of Environmental Protection under chapter 310 of the Maine Natural Resources Protection Act. All coastal wetlands and great ponds (inland bodies of water >10 acres in size) are classified as WoSS. In addition, a freshwater wetland may be considered one of special significance if it: (1) contains a natural community that is critically imperiled or imperiled as defined by the Maine Natural Areas Program; (2) contains significant wildlife habitat; (3) is located within 250 feet of a coastal wetland; (4) is located within 250 feet of a great pond; (5) contains at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation, or open water; (6) is inundated with floodwater

¹ Environmental Laboratory. (1987). Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

² U.S. Army Corps of Engineers. (2012). Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

³ Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131 pp.

during a 100-year flood event based on flood insurance maps; (7) is or contains peatlands; or (8) is located within 25 feet of a river, stream or brook. FBE assessed the Survey Area for the presence of WoSS.

GENERAL SITE DESCRIPTION

The Survey Area consists of an unmanicured section of land east of Stonecliff Road, west of St. Martins Lane and in-between the Abenakee golf course to the south and Wood Island Harbor to the north. The area consists of a large, approximately 5.3-acre freshwater wetland complex surrounded by approximately 3.3 acres of shrub thicket comprised mainly of non-native, invasive plant species. A small, approximately 1.3-acre area of old field is situated in-between the manicured portion of the golf course and the terrestrial shrub thicket.

The Survey Area generally slopes north away from the golf course and towards the wetland and Wood Island Harbor. The wetland complex itself is relatively flat. The northeastern end of the Survey Area is particularly steep, consisting mainly of shrub thicket that is presumably difficult to manage due to the slope.

WETLAND AND TERRESRIAL COVER TYPES

A total of four separate cover types were mapped within the Survey Area – two of which are wetland and two are terrestrial. The wetland complex within the Survey Area meets the criteria to be considered WoSS, as much of it is within 250 feet of a coastal wetland. No potential vernal pools were observed within the Survey Area. Descriptions of mapped areas are below, and photos are provided in Attachment 3.

Scrub-Shrub Wetland (PSSIE)

The area mapped as Scrub-Shrub Wetland meets the classification of a seasonally flooded/saturated palustrine scrub-shrub wetland with broad-leaved, deciduous vegetation. The wetland is comprised of predominantly freshwater vegetation species. It does not appear that the wetland is regularly flooded with saltwater although it is a possibility during spring tides and/or significant storm events.

Small red maple trees are present, but not dominant in the wetland. The vegetation of the wetland is instead dominated by thick patches of common winterberry (*Ilex verticillata*) with bayberry (*Morella caroliniensis*), speckled alder (*Alnus incana*), meadowsweet (*Spiraea alba*), and large specimens of poison ivy (*Toxicodendron radicans*) also present in the shrub layer. Observed herbaceous vegetation in this portion of the wetland included cinnamon fern (*Osmundastrum cinnamomeum*) and skunk cabbage (*Symplocarpus foetidus*).

The interior of the wetland is dominated by native vegetation, with no noted presence of invasive vegetation. There are several patches of non-native, invasive purple loosestrife (*Lythrum salicaria*) present along the outskirts of the wetland.

Emergent Marsh Wetland (PEMID)

A stand of broad-leaved cattail (*Typha latifolia*) is situated within the center of the larger scrub-shrub wetland. The area meets the classification of a continuously saturated palustrine emergent wetland with persistent vegetation (PEMID). (“Persistent” means there is evidence that the vegetation remains throughout the winter until the next growing season). This area has a wetter hydrologic regime than the surrounding scrub-shrub wetland.

Old Field

“Old field” is a term used in ecology that describes lands that were formerly cultivated or grazed but were later abandoned. Areas of old field, if left alone, typically regenerate into a cover type that would naturally be present. In the case of the Survey Area, if left unmowed the old field area will likely transition to a community similar to or identical to the adjacent shrub thicket (described below).

Shrub Thicket

A very dense area of shrub thicket surrounds the wetland complex within the Survey Area. This area is dominated by non-native, invasive plant species, namely Morrow’s honeysuckle (*Lonicera morrowii*) and Asiatic bittersweet (*Celastrus orbiculatus*) with some Japanese barberry (*Berberis thunbergii*) also present. Native shrub species observed in the upland shrub thicket included raspberry (*Rubus* sp.), staghorn sumac (*Rhus hirta*), and willows (*Salix* sp.).

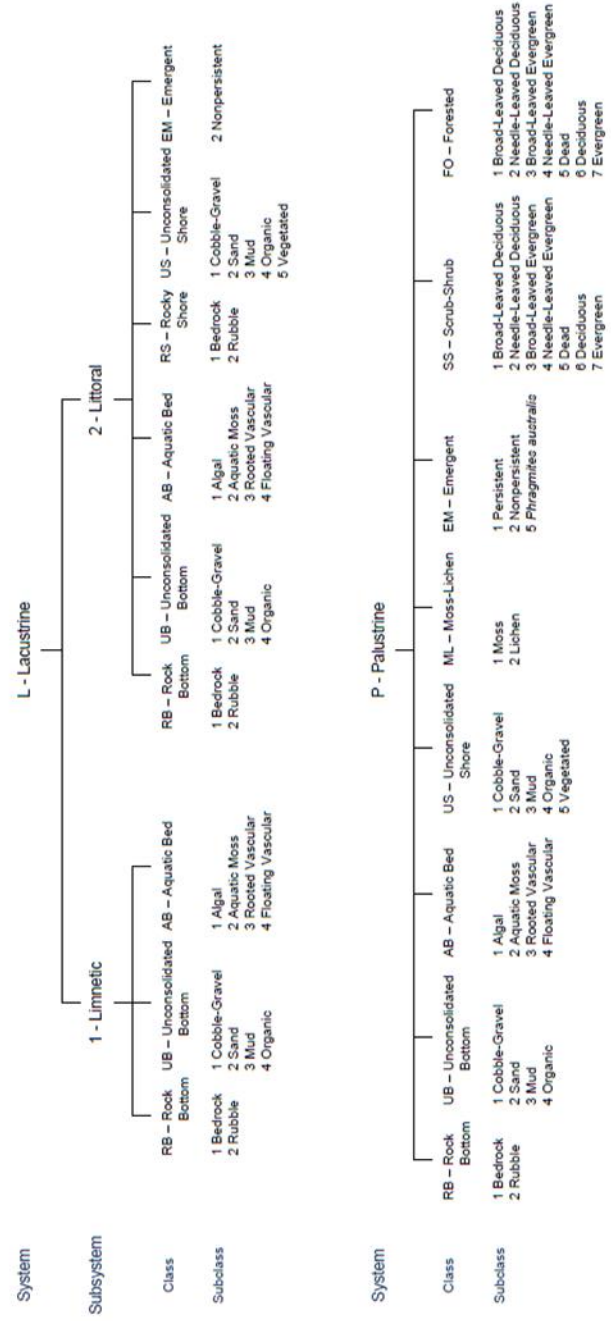
CONCLUSION

The wetland complex within the Survey Area meets the criteria to be considered WoSS, owing to its proximity to a coastal wetland. A formal wetland functions and values assessment was not part of the scope of this project; however, the wetland complex undoubtedly provides a number of important functions and values, specifically groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, educational and scientific value, uniqueness/heritage, and visual quality/aesthetics.

This WoSS designation will likely result in increased permitting standards (i.e., increased time and cost) if alterations or development are proposed within the Survey Area. Due to its relatively pristine condition and proximity to the ocean, it would be environmentally and ecologically prudent to avoid any human disturbance to the wetland complex

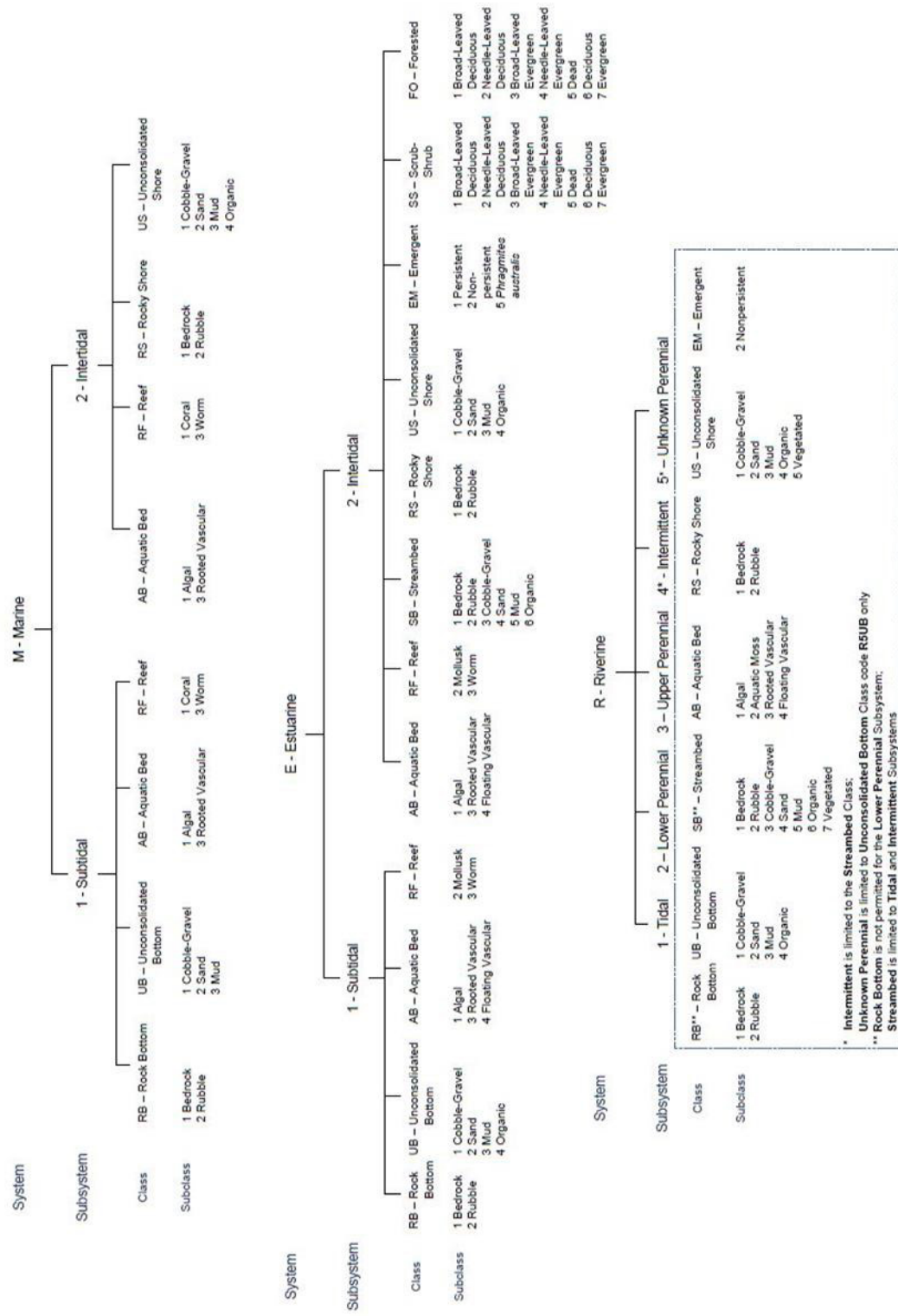
ATTACHMENT 1. COWARDIN WETLAND CLASSIFICATION SYSTEM

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

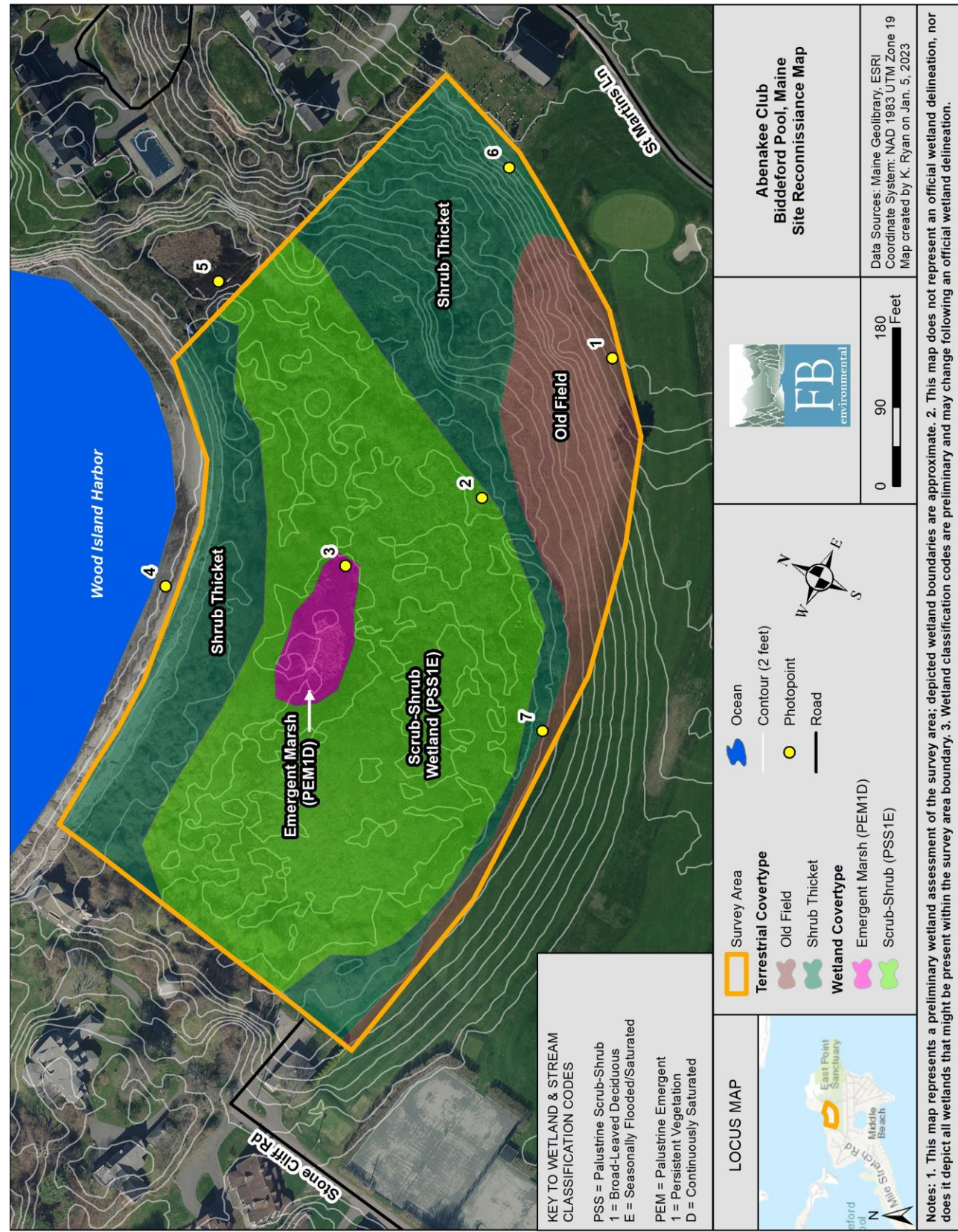


MODIFIERS		
In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The former modifier may also be applied to the ecological system.		
Water Regime		
Water Regime	Special Modifiers	Water Chemistry
Nontidal A Temporarily Flooded B Saturated C Seasonally Flooded E Seasonally Flooded/Saturated F Semipermanently Flooded G Intermittently Exposed H Permanently Flooded J Intermittently Flooded K Artificially Flooded	Saltwater Tidal L Subtidal M Irregularly Exposed N Regularly Flooded P Irregularly Flooded/Saturated S Temporarily Flooded-Tidal R Seasonally Flooded-Tidal T Semipermanently Flooded-Tidal V Permanently Flooded-Tidal	Freshwater Tidal b Beaver d Partially Drained/Ditched f Farmed h Diked/Impounded r Artificial s Spoil x Excavated
	Freshwater Tidal 1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	Inland Salinity pH Modifiers for all Fresh Water 1 Hypersaline 2 Euhaline 3 Mesohaline (Brackish) 4 Polyhaline 5 Mesohaline 6 Oligohaline 0 Fresh
	Soil 0 Organic 1 Mineral	

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



ATTACHMENT 2. WETLAND RECONNAISSANCE MAP



ATTACHMENT 3. SITE PHOTOGRAPHS



View of the Survey Area from the Abenakee Club golf course.



Photopoint 1. The area of old field in-between the golf course and the shrub thicket.



Photopoint 2. The interior of the scrub-shrub wetland.



Photopoint 3. View from the edge of the emergent marsh within the larger scrub-shrub wetland.



Photopoint 4. The interface between the beach and the shrub thicket.



Photopoint 5. Thick winterberry (*Ilex verticillata*) at the northeastern end of the Survey Area.



Photopoint 6. View over of shrub thicket on the steep slope at the northeast end of the Survey Area.



Photopoint 7. A stand of purple loosestrife at the edge of the wetland complex.