

**Site Weed Management Plan
for
Lower Thorp Brook Floodplain
Charlotte, Vermont**

June 27, 2017

INTRODUCTION

A. Description and Values of Site

Lower Thorp Brook floodplain is comprised of a 19.5-acre zone influenced by Lake Champlain water levels. It is a matrix of flood plain forest, wet meadow, and shallow emergent marsh wetland communities bordered by upland forest and fallow agricultural fields. Hydrology is heavily influenced by beaver activity. Human access is very limited, and increases in winter months.

Thorp Brook is one of two watersheds that feed the Thorp/Kimball wetland complex in Lake Champlain. This is a highly valued community, a 54-acre complex of floodplain forest, silver maple swamp, button bush swamp, deep bullrush marsh, deep broadleaf marsh, cattail marsh, and shallow emergent marsh that opens to the waters of Town Farm Bay in Lake Champlain. Concerted efforts to control European frogbit have been in place for 10 years. According to the Vermont Agency of Natural Resources, *Iris pseudacorus* possess the next greatest exotic/invasive threat to the diverse plant communities. The Thorp Brook survey and treatment area has been identified as the main seed source for iris in the wetland complex.

B. Exotic/Invasive Plant Species Impacts to Management Goals

The ecological integrity of both the Thorp/Kimball wetland complex and Lower Thorp Brook floodplain is attributed, in great part, to the diversity of plant natural communities. *Iris pseudacorus* has the ability to invade and outcompete many of the native plant species that define these communities. The Lower Thorp Brook floodplain is pressured as well by reed canary grass (*Phalaris arundinacea*), and flowering rush (*Butomus umbellatus*).

The decision to control yellow iris in the presence of *Phalaris* and *Butomus* is based on the following factors:

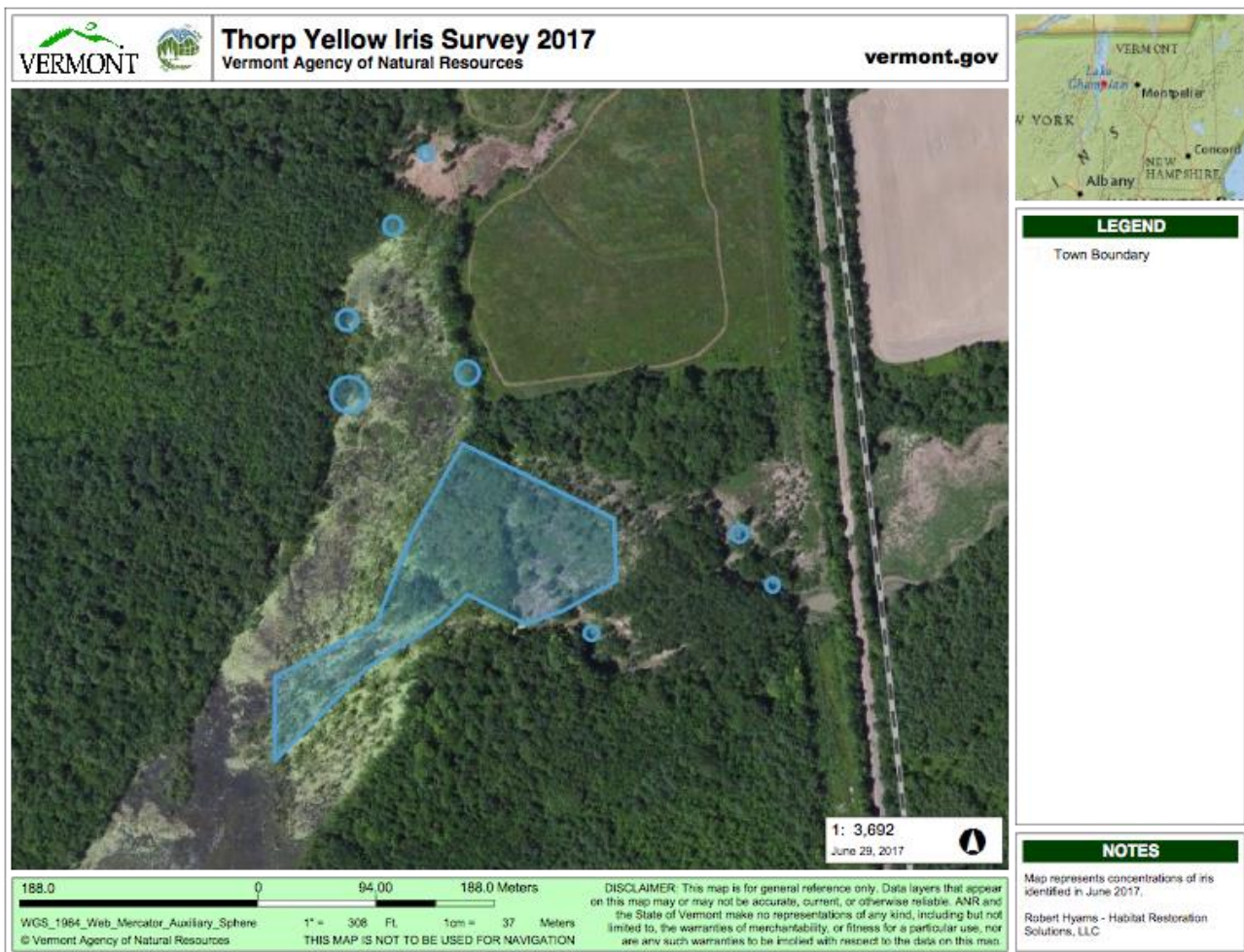
1. *Iris* can invade virtually all natural plant communities of both the marsh and floodplain. *Butomus* is well adapted to these communities as well. Established stands of *Phalaris* can tolerate extended periods of inundation, but will likely not establish in the deeper marsh communities,
2. *Iris* populations appear to be growing at a significant rate. *Butomus* has been present in these areas for years,
3. *Iris* produces large, dense seeds that are transported by water only. *Phalaris* seeds are much more prone to wind distribution and are therefore, harder to exclude.

C. Inventory of Targeted Plant Species

Site surveys were conducted on June 15 and June 28, 2017. The efforts were complicated by consistently high-water levels. Gauge levels were 97.4 and 97.2ft (Echo gauge) respectively. By comparison, for the week of June 8-16 of 2016, levels were 95.8ft. A 1-foot change has a huge effect on this landscape.

The Lower Thorp Floodplain can be divided into a north arm and east arm. The majority of iris is found in the east arm. While much of the north arm was inaccessible this season due to water levels, we suspect that the north arm harbors much less due to prevalent land forms. That said, it would certainly warrant survey at lower water levels.

The surveys generated actual clump locations and navigation data. This data will be useful during fall treatment, but actual data points may not be helpful in illustrating the level of infestation.



SETTING PRIORITIES

Exotic/Invasive work often leads to laser-like focus. A concerted effort should be made to consider all stressors, and not just our target species. While the focus of this grant is specific to control of yellow iris, it should be noted that water quality, specifically high-nutrient flows from agricultural lands clearly impact the health of the natural communities, to a degree in the floodplain, and to a greater extent in the Thorp/Kimball wetland complex.

Changes to land use in adjacent parcels are not anticipated. There are few landowners and they have expressed an interest in helping to maintain ecological integrity of these resources.

The following table discusses the exotic/invasive species that have been identified in the floodplain. it is likely that others are present and have yet to be identified.

	VT Noxious Designation?	Wetland Status	Level of Infestation	Natural Community Threat	Potential for Control
Iris pseudacorus (yellow iris)	Yes	Obligate	Present in moderate levels and expanding rapidly	identified as primary threat to emergent vegetation communities of T/K wetlands	plants respond well to single foliar application (fall) of herbicide. Persistent seed bank likely, but not established.
Phalaris arundinacea (reed canary grass)	No	Fac. wet	Present in moderate levels and expanding rapidly	A significant threat to wet meadow communities, found mostly in Thorp Floodplain survey area	Extensive rhizome/root mass, difficult to kill with single herbicide application. Prolific seed producer, seeds will persist for at least 1 year.
Botumus umbellatus (flowering rush)	Yes	Obligate	Present in moderate levels, not showing evidence of expanding	Not a significant threat to either site	likely responds to herbicide, difficult to limit off-target damage.
Lysimachia nummularia L. (moneywort)	No	Fac. wet	Present as ground cover in large infestation, covering X% of wet meadow community	established component of herb layer, endemic to area lake influenced floodplains	Likely responds to herbicide, difficult to limit off-target damage.
Myosotis Scorpioides (forget-me-not)	No	Obligate	Present as ground cover in large infestation, covering X% of wet meadow community	established component of herb layer, endemic to area lake influenced floodplains	Likely responds to herbicide, difficult to limit off-target damage.
Hydrocharis morsus-ranae (European Frogbit)	Yes	Obligate	Present as a new population, posses some threat to emergent communities	a serious threat to T/K wetland, not known how it will progress in survey area	Levels can be controlled by regular manual removal, particularly in open waters. Difficult to control in emergent vegetation.

**Treatment Plan for *Iris pseudacorus* (yellow iris)
Thorp Brook Floodplain
June - October 2017**

Description: *Iris pseudacorus* is found in an array of natural communities, and prominently in shallow emergent and wet meadow communities. Plants grow in clumps, ranging in size from a single plant to hundreds of plants. Plants can reach 6 feet in height, and can develop multiple flowers. Flowers in turn produce seed pods that can produce 80+ seeds per pod.

Survey Methods and Results: Preliminary surveys have identified an average of 8 clumps per acre. This figure will be revised upon conclusion of survey. The site is surveyed on foot, tracks and iris clumps are recorded (as waypoints) electronically, and mapped using ANR Atlas. When clumps are located, surveyors cut plants to eliminate flowers and subsequent seed production. Foliage will regenerate adequately to serve as target for fall foliar application.

Treatment Objectives: Eradicate 90+% of clumps in Thorp flood plain. This is in support of on-going efforts to eradicate all iris in emergent vegetation of Thorp/Kimball wetland. Fall foliar treatment is extremely effective. Success rate is determined by accessibility. The June 2017 survey season has seen lake levels averaging 97.3 feet above sea level, higher than historical averages. If high water levels persist into the control season, access and treatment success will be impacted.

Treatment Methods: Foliar treatment in late September and early October offers a number of advantages:

- herbicide is highly effective at this stage of plant development
- lake level averages 95.3 feet for improved access
- off-target impacts are greatly reduced as amphibians are much less active

A foliar application of 5% Rodeo herbicide (glyphosate active ingredient) with an aquatic approved surfactant applied using a backpack sprayer is proposed. Where appropriate, screening will be used to avoid overspray.

Landowner Consent and Regulatory Approval

There are two landowners in the survey area. While both have granted access for survey purposes, they have yet to agree to herbicide application. One landowner expressed that they will likely defer to ANR, so if Wetlands Program approves, they will likely agree. Wetlands Program approval is required for implementation of this treatment plan.

Efficacy Monitoring: subsequent season monitoring of Thorp floodplain will ultimately determine efficacy of treatment. We are confident that the treated clumps will be eliminated. Clumps that do not receive treatment and any expression of the seed bank will yield further seed production. Reduced presence of iris in the emergent communities of the Thorp/Kimball wetland may be the best available measure of success.