Town of Falmouth

Invasive Terrestrial Plants Management and Control Plan

December 3, 2018

Purpose

The purpose of this plan is to integrate the Town's education and control efforts in a manner that results in a comprehensive, Townwide approach to controlling the establishment and spread of invasive terrestrial plants in Falmouth. The intent is to minimize the presence of invasive plants and preserve the ecological integrity of Falmouth's landscape. Control practices are also applicable to nuisance plants, such as poison ivy, and to forest management as specified in individual open space parcel management plans.

This plan documents the current practices of the Town and creates a process for future management. The school department has a separate management plan for invasives and is not included in this plan.

Background

Invasive terrestrial plants pose a threat to the integrity of natural ecosystems by outcompeting and displacing native plants. Unlike the plants they displace, invasives do not host insects or provide food sources (e.g. berries, seeds) that meet the nutritional needs of wildlife, especially birds. They leaf out earlier in the spring and stay greener longer in the fall, crowding out native species in the competition for sunlight and soil nutrients. They threaten forest regeneration, lack natural enemies or diseases, and degrade nesting habitat. Some species are a threat to human health by hosting up to eight times as many ticks as native plants. Globally, invasive plants pose a great threat to biodiversity, along with habitat loss.

Common Invasive Plants

Autumn Olive
Barberry
Bittersweet
Buckthorn
Buckthorn
Burning Bush
Honeysuckle
Knotweed
Multiflora Rose
Norway Maple
Purple Loosestrife
Swallowwort

For the past ten years, the Town of Falmouth has educated residents about this issue and established a program to control the growth and spread of invasive plants. The Conservation Commission has led this work by establishing demonstration control plots, holding workshops, distributing literature, staffing a table at the polls on election days, partnering with area nurseries and landscape businesses, and providing onsite advice to landowners. The commission was the catalyst for Council adoption of new ordinances governing the sale of invasive plants and restrictions on new subdivision plantings.

Since 2014, the Town, through an annual contract with a commercial contractor, treats rights-of-way infestations of invasive plants. Invasives are mapped townwide, landowners contacted, an explanatory workshop held, and herbicide treatment applied to all identified

properties unless the landowner objected. During these annual week-long control efforts, the contractor also treats invasive infestations on some Town properties, including several parks and open space properties. Through an annual $15,000 Town appropriation from the Council, this work has proven very effective in reducing invasive populations townwide. One has only to travel Routes 1, 9, or 100 to see the marked difference between Falmouth's invasive terrestrial plant population compared to those in neighboring Towns.

Additionally, the Parks & Community Programs (PCP) Department utilizes an outside contractor to control especially heavy infestations of invasives in Underwood Park and Village Park and to treat invasives growing in the newly acquired Suckfish Brook Conservation Area property, as required by the grant funder of that project. The Town has also used licensed staff and volunteers to control invasives on Town open space properties utilizing multiple treatment methods.

As a result of this multi-pronged approach to invasive control, the Town has gained statewide recognition as a leader in addressing a problem that is just beginning to get widespread public attention.

Target Treatment Areas

Five distinct areas have been identified as a priority for invasive plant management and control. It is recognized that invasive plants can never be eliminated, only managed, and that some areas of Town are infested beyond control, at least at the present time.

1. Town Open Space Properties

As a result of proactive open space acquisition efforts spanning several decades, the Town now owns over 2,500 acres of open space land in fifteen designated areas. These parcels were acquired with the goal of preserving them in their natural, undeveloped state. Managed for wildlife habitat, water quality, recreation, aesthetics, carbon sequestration, flood control, and other ecological values, these properties require that invasives be controlled to protect their ecological integrity. Invasive plants on a number of these properties have been significantly reduced in numbers. Some have little or no invasive problem at present; others still have robust invasive populations.

2. Parks

The Town owns 206 acres of land designated as public parks in sixteen locations, ranging from 0.6 to 120 acres in size. Some parks are entirely dedicated to public recreation (e.g. Village Park, Graves School Park); others also contain undeveloped areas (e.g. Community Park, Underwood Park). An outside contractor has done invasive control in

Underwood and Village Parks for over ten years, and more recently in Community Park, Walton Park, and Graves School Park. However, significant invasive populations remain in several parks. All park properties should be mapped for invasive populations to determine the current level of infestation in each park.

Parks containing athletic playing fields require special attention and should continue to be managed according to the best integrated pest management (IPM) practices now in place.

3. Town Facilities

Invasive plants are commonly found on various Town-owned facilities, including the Transfer Station, Public Works complex, Town Hall, various fire stations, Wastewater properties, and Public Safety. Invasive control on these properties is important for at least two reasons: (1) to model the kind of control we hope private landowners will implement on their property; and (2) to prevent these plants from spreading to surrounding areas. Some control efforts have been made, especially on the Transfer Station and Public Works properties, but a full assessment of these properties should be done to determine the extent of the problem.

4. Public Rights-of-Way

Invasive plants are frequently found along roadsides where sunlight is abundant, where road construction or repair work has introduced the plants, or where snowplows have helped spread them (particularly knotweed). Over the past four years, rights-of-way control has been done in every section of the Town. That work has had a significant impact on invasive populations. The need for this work will continue, albeit at reduced levels, since there is still a lot of seed in the ground that will produce new plants over the next few years.

5. Private Properties

Since many invasive populations can be found on private property, some means for supporting control of invasives on private land must be developed if the Town is to meet its goal of townwide invasive control. Otherwise, these plants will remain a significant seed source enabling their spread to other properties in their proximity. Given the number of private properties in Town and the prevalence of invasives on many of these properties, this will be the most challenging of the five targeted treatment areas and will be primarily educational in scope.

Education efforts will be coordinated with other environmental organizations that have an interest in Falmouth, including the Falmouth Land Trust, Maine Audubon Society, Maine Coast Heritage Trust, Portland Trails, and the State of Maine.

Treatment Methods

Invasive plant treatment programs typically include three integrated approaches to control invasive plants. The guiding industry standard of Integrated Pest Management (IPM) is to use pesticides only when absolutely necessary, when other methods are ineffective or impractical, and at the lowest toxicity levels that will achieve the desired result.

The three treatment methods used to control invasive terrestrial plants include:

- Mechanical control: mowing, pulling, smothering, and otherwise physically removing or killing the target plants.
- Biological control: introducing insects, diseases, or other living organisms that attack and control target plants.
- Herbicides: applying chemicals that kill the target plants.

While mechanical control can work on a small scale, such as in an individual yard, it is not practical when dealing with the many thousands of plants spread out over the 30 square miles that comprise the Town. Annual mowing of the fields at River Point, North Falmouth, Blackstrap Hill, and Hardy Road provides some control by keeping the plants from maturing and going to seed. Pulling young plants is effective for many species, especially the shallower rooted ones, such as bush honeysuckle or purple loosestrife. However, pulling does disturb the soil and creates soil disturbance that in turn promotes seed sprouting. In the past, student volunteers have successfully pulled invasives in Community Park.

Biological control of these plants is largely ineffective since all but purple loosestrife has no known natural enemies. Loosestrife has been successfully controlled in areas to the south of us by the introduction of *Galerucella* beetles. To date, these beetles have not firmly established themselves in Maine any farther north than York County, although they might in the future. Goats are used in some areas to control invasives, but goats eat all the plants in a target area, even the desirable ones. While they do a good job of eating the vegetation above ground, they do not kill the roots. The plants will regenerate once the goats are gone.

Invasive plant control on a townwide scale requires the appropriate use of herbicides to kill or reduce the spread of invasive terrestrial plants. Three different herbicides are used in Falmouth's control efforts, all of which are rated low by the Environmental Protection Agency and the State of Maine in regard to their effect on the overall environment. These herbicides are described more thoroughly in the Appendix II.

Control Strategies

Table I summarizes the control strategies that should be used for each of the targeted areas.

Table I: Control Strategies by Target Area

CC - Conservation Commission; ESC- Energy and Sustainability Coordinator; FCC-Conservation Commission; OC - outside contractor; OSM – Open Space Manager; PS- Parks staff; TS-Town staff.

Target Area	Control Strategies	Responsible Party
Town Open Space Properties	1. Inventory properties to determine current infestation levels, GPS their locations where appropriate, then prioritize areas for treatment as low, moderate, or heavily impacted. Pay particular attention to areas that have been harvested in recent years.	ESC, FCC, OSM
	2. Inventory properties annually to determine the effectiveness of control efforts and to identify new invasive populations.	ESC, FCC, OSM
	3. Mow existing fields annually to stunt invasive growth and prevent plants from going to seed.	PS
	4. Maintain equipment and herbicide inventory; keep state required records.	ESC
	5. Publicize control efforts during treatment in publicly used areas to educate and inform visitors.	ESC
	6. Treat areas with low to moderate invasive levels.	OC or TS
Town Parks	1. Inventory park properties to determine current infestation levels, then prioritize areas for treatment as low, moderate or heavily impacted.	ESC, PS
	2. Continue to seek training opportunities for Park staff related to invasive plant control and develop a system that allows them to easily report their location.	PS
	3. Treat areas with low or moderate invasive infestations.	OC or TS
	4. Publicize control efforts during treatment in publicly used areas to educate and inform park visitors.	PS
Town Facilities	1. Working with department heads, identify all Town properties that have invasive populations.	ESC
	2. Inventory those properties to determine infestation levels.	ESC

Table I: Control Strategies by Target Area

CC - Conservation Commission; ESC- Energy and Sustainability Coordinator; FCC-Conservation Commission; OC - outside contractor; OSM – Open Space Manager; PS- Parks staff; TS-Town staff.

Target Area	Control Strategies	Responsible Party
	3. Treat areas with low or moderate invasive infestations	OC or TS
Public Rights-of-Way (town controlled)	1. Continue past efforts to identify locations of invasives and prioritize them.	ESC, CC
	2. Notify and educate landowners about invasives and the control plan.	ESC
	3. Train Public Works, Wastewater, and other Town employees who travel Town roads frequently to identify invasive plants and develop a system that allows them to easily report their location.	ESC
	4. Train volunteers (e.g. - Conservation Corps members, Conservation Commission members) to identify invasive plants and develop a system that allows them to easily report their location.	ESC, CC
	5. Play particular attention to inventorying multiflora rose, honeysuckle, and purple loosestrife when they are in bloom. In subsequent years, schedule treatments to coincide with the blooming period, especially for multiflora rose, loosestrife, and knotweed.	ESC
	6. Contract with a licensed company to apply control measures and to cut and treat rights-of-way invasives over six feet in height (primarily buckthorn and bittersweet).	ESC
	7. Have Public Works remove and dispose of large dead plants that result from the roadside treatment.	ESC
Private and Other non-townProperties	1. Do an educational mailing to all private landowners explaining the issue, offering control suggestions they might implement, and offering the opportunity for third party control work (at their cost).	CC, ESC
	2. Offer assistance to property owners requesting help in identifying and controlling their invasive plants through workshops and other means.	CC, ESC
	3. Educate landowners regarding the proper disposal of invasive plants.	CC, ESC
	4. Maintain and improve relationships with state agencies, Audubon, Central Maine Power, Falmouth	All parties

Table I: Control Strategies by Target Area		
CC - Conservation Commission; ESC- Energy and Sustainability Coordinator; FCC-Conservation Commission; OC - outside contractor; OSM – Open Space Manager; PS- Parks staff; TS-Town staff.		
Target Area	**Control Strategies**	**Responsible Party**
	Land Trust, Maine Turnpike Authority and Maine Coast Heritage Trust	

Other Possible Partners

The Public Works Department has several important roles to play regarding invasive plant control, and its support of this effort is very important to a successful program. Those roles include:

1. Helping control the spread of invasives by using clean fill when doing road repairs or reconstruction.
2. Properly disposing or treating infected soil that may be removed from rights-of-way.
3. Making sure trucks are cleaned after they transport any infected soil.
4. Treating known invasives in areas designated for road construction a year before starting any road or rights-of-way construction work.
5. Removing dead plants killed in the rights-of-way control program.

Obtaining similar support from the State Department of Transportation when that agency does rights-of-way work in Falmouth should also be pursued. Similar support might be possible from Central Maine Power since they already control vegetation growth in their utility corridors in Town. Finally, an existing relationship with the Maine Turnpike Authority to control invasives on the Falmouth stretch of the Turnpike and Spur should be continued.

Education

A great deal of the success Falmouth has had in controlling invasives has been due to the extensive public education work done by the Conservation Commission over the past ten years about the nature of the problem, plant identification, and proper control and disposal methods. These efforts should continue in parallel with the Town's control work to ensure that the community continues to support this initiative. Direct methods, such as a table at the polls, public workshops, mailings, etc. are very effective, but they must should be combined with mass media as well (social media, newspaper articles, email blasts, signage, etc.) to complement current efforts. Existing connections with the schools are also an important way of reaching both

future generations and their parents regarding the scope and importance of this environmental issue. An annual calendar of educational events should be developed and responsibility for each activity assigned.

Implementation

Successful implementation of this plan will require a significant investment in human resources, both internal and external. Currently the Energy and Sustainability Coordinator is tasked with managing the overall organization and implementation of this work in conjunction with the Conservation Commission, Open Space Manager, and Parks & Community Programs Director.

These individuals, plus representatives of other key Town departments with roles to play in the implementation of this plan, should form an informal “invasives team” and meet periodically to review the status of the work and make adjustments to the plan that may be necessary.

It is recognized that the implementation of this plan is dependent on the priority given to resources to manage and execute it. Table II is a draft framework to develop a comprehensive, reasonable implementation strategy and will be the first task of the project manager.

The feasibility of a staff member getting licensed as a Master Pesticide Applicator responsible for controlling invasives in low to moderately infested areas could be explored. Outside contractor(s) should continue to be used to control invasives along public rights-of-way and in heavily invested areas on Town parks, open space properties, and facilities.

The Conservation Commission will continue to play a key role, particularly in educating the public and perhaps in mapping invasive populations.

Table II: Task/Time Loading Chart

CC - Conservation Commission; ESC- Energy and Sustainability Coordinator; FCC-Conservation Commission; OC - outside contractor; OSM – Open Space Manager; PS- Parks staff; TS-Town staff.

Task	Who	Staff Hr.	Vol. Hrs.	Time line	Est. Cost	Priority
Create an informal Invasives Team that includes representatives of all Town committees and departments with a role to play in this work.						

Table II: Task/Time Loading Chart

CC - Conservation Commission; ESC- Energy and Sustainability Coordinator; FCC-Conservation Commission; OC - outside contractor; OSM – Open Space Manager; PS- Parks staff; TS-Town staff.

Task	Who	Staff Hr.	Vol. Hrs.	Time line	Est. Cost	Priority
Map invasives on all target areas, including: Parks Rights-of-Way Other Town properties						
Contract with an applicator to treat rights-of-ways, parks, open space areas, and other Town properties.						
Develop a system for offering the contractor's services to private landowners interested in invasive control.						
Do spot treatments of invasives where needed.						
Mow fields annually in Blackstrap Hill, North Falmouth, and River Point.						
Remove and dispose of large, dead roadside plants killed by spraying.						
Develop an easy to use invasive reporting system for Town employees, Conservation Commission members, and community volunteers. Then train them in the process. Keep good records of reported locations.						

Table II: Task/Time Loading Chart						
CC - Conservation Commission; ESC- Energy and Sustainability Coordinator; FCC-Conservation Commission; OC - outside contractor; OSM – Open Space Manager; PS- Parks staff; TS-Town staff.						
Task	**Who**	**Staff Hr.**	**Vol. Hrs.**	**Time line**	**Est. Cost**	**Priority**
Develop an annual calendar scheduling educational events for publicizing the need for invasive control and the Town's efforts in that regard. Mailing(s) Poll table Workshops Media						
Seek support from MDOT, MTA, and CMP.						
Maintain any herbicide application equipment the Town owns.						
Keep required records and report to the State annually.						
Create a website to educate and engage the public.						

Budget

A budget will be determined after the invasives team completes Table II.

Appendix I: Resources

There is a great deal of information about invasive terrestrial plants to be found on-line. Some of the best sources include:

Maine Natural Areas Program:
www.maine.gov/dacf/mnap/features/invasive_plants/invasives.htm
www.maine.gov/dacf/mnap/features/invasive_plants/invsheets.htm
www.maine.gov/dacf/mnap/features/invasive_plants/invasives_gallery.htm

Maine Cooperative Extension:
https://extension.umaine.edu/publications/2536e/

Maine Organic Farmers & Gardeners Association (MOFGA)
www.mofga.org/Publications/The-Maine-Organic-Farmer-Gardener/Summer-2009/Invasives

The Maine Cooperative Extension Office on Clearwater Drive also has print copies of the various Invasive Plant Fact Sheets available to the public.

Appendix II: Regarding Herbicides

It is estimated that humans are exposed to over 90,000 chemicals in their lifetime, only a few thousand of which have actually been tested for their health and environmental impacts. They can be found in our food, clothing, furniture, medicines, health care and cleaning products, cosmetics, containers, and many household items. Thus public concern about widespread chemical use is well warranted.

All chemicals are not created alike, however: they range widely from beneficial to highly toxic. Some herbicides are considered quite safe if used properly and in low concentrations. They don't affect animal life, don't persist in the environment, and don't contaminate water supplies. Although no long-term studies have shown that these types of herbicides have any adverse human health effects, it should always be assumed that they might and thus be used carefully.

In regards to invasive plant control, the decision to use herbicides in the name of conservation poses a this dilemma: What's worse, losing the integrity of our natural ecosystems as these plants spread across our landscape and degrade wildlife habitat or using low risk herbicides to control their spread? The Town, like all the major land owning environmental organizations in Maine, regards the threat of invasive plants to our environment to be so critical that it has opted for herbicide use, when required, to control them. The Town believes the benefits of pesticide use outrank the environmental risk because;

- The herbicides used are the safest available, used in low concentrations, and degrade rapidly;
- The plants are individually spot treated (the herbicide is not indiscriminately applied);
- Only one application is needed to kill most plants (unlike lawn chemicals that are applied repeatedly);
- There is no risk of human exposure (no exposure, no hazard); and
- As the population of invasive plants is reduced, the need for treatment declines significantly.

Three specific herbicides are used in Falmouth. *Rodeo*™. The most frequently used herbicide, Rodeo™ is a glyphosate formulation approved for use in wetlands. It works by interfering with the production of three of the seven amino acids plants need to survive (none of these amino acids are found in animals). It has a short half-life (average ±40 days); firmly binds to the soil to prevent groundwater contamination; has no known impact on insect or other animal

life; and even in low concentrations will effectively kill all but knotweed in one application (knotweed can require applications for up to three years to fully kill it) . *Rodeo*™ is most commonly applied to the foliage of invasive plants in a 2% concentration. It is non-selective and will kill adjacent plants if not carefully applied. *Rodeo*™ is used in rights-of-way control efforts. It is effective when applied at any time when the plants are still leafy green. Spring and fall are particularly good times for application because invasives are often the only green plants visible on the landscape and thus easily located.

Garlon IV™ *is* a triclopyr herbicide that is also approved for wetland use. In Falmouth, it has been used primarily for basal (cut stump) control of woody invasives, such as large bittersweet vines and buckthorn trees. It too has a short half life and is readily bound up in soil. For that purpose, it is most often mixed with a vegetable oil in a 25% concentration, and then sprayed or brushed onto a cut stump. This approach is more labor intensive, but highly effective, and can be used any time of year in dry conditions. *Garlon IV* can also be used as a 2% formulation (with water) that can be applied to foliage. It is a selective herbicide that kills broadleaf plants, but not grasses. It is used, for example, to kill poison ivy growing along trails without affecting the surrounding vegetation. It is much more expensive than *Rodeo*™ and rarely used as a foliar treatment.

Aminopyralid is the active ingredient in *Milestone*™*. Milestone*™ is particularly effective in killing knotweed, the most difficult invasive plant to control. When used in that regard, it is mixed with *Rodeo*™ to provide the best control. It should not be used in or around evergreen plants.

The Environmental Protection Agency and the Maine Board of Pesticides Control considers all three of these herbicides to pose a low risk to the environment and human health. As such, they are used by all the major conservation entities in Maine to control invasive plants on their properties. The Friends of Casco Bay, which measures water quality in Casco Bay on a regular basis, has never detected glyphosate, triclopyr or aminopyralid in those waters.