2013
New Hampshire Department of Agriculture's
Statewide Invasive Species Control Project

Re: Watershed Special Permit #SP-002

Introduction

This is the end of the year report for the 2013 Statewide Invasive Species Control Project (SISCP), a cooperative effort involving the NH Dept. of Agriculture, Markets & Food (DAMF) and the NH Dept. of Transportation (DOT) for the control of prohibited invasive species listed in AGR 3800. The purpose of this project is to help preserve and protect the state's natural and economic resources, agricultural commodities and forest products by means of eliminating and reducing the presence of invasive species within state and federal highway rights-of-way (ROW). Roadways have been documented as being a key vector for spreading invasive plants as a result of frugivorous birds feeding on invasive species fruits and excreting the seeds as they move about. Although this project utilizes Integrated Pest Management (IPM), this report focuses solely on the herbicide aspect, which is discussed below.

In accordance with the Watershed special permit SP-002, a total of 20 highway system and one state owned parcel were approved for herbicide applications to treat invasive plants. Table 1 identifies the treatment sites and their locations.

2013 Invasive plant treatment sites

Location	Town Beginning	Town End	Land Use
Route 1	Portsmouth	Seabrook	ROW
Route 1A	Portsmouth	Seabrook	ROW
Route 1B	Portsmouth	Portsmouth	ROW
Route 3	Ashland	Gilford	ROW
Route 3	Belmont	Gilford	ROW
Route 9	Keene	Hopkinton	ROW
Route 11	New London	Franklin	ROW
Route 11	Gilford	Rochester	ROW
Route 16	Rochester	Portsmouth	ROW
Route 25	Warren	Plymouth	ROW
Route 101	Manchester	Hampton	ROW
Route 103	Newport	Warner	ROW
Route 104	New Hampton	Meredith	ROW
Route 106	Meredith	Pembroke	ROW
Route 114	New London	Bradford	ROW
Route 175	Campton	Holderness	ROW
I-89	Lebanon	Bow	ROW
I-93	Thornton	Salem	ROW
I-393 & Route 4	Concord	Durham	ROW
I-95	North Hampton		ROW
Scrutton Pond Rd	Barrington		DOT property

Table 1

Herbicide applications commenced on August 27, 2013 and ended on December 4, 2013. Late summer through mid-fall is typically the optimum time of year for conducting herbicide treatments due to improved translocation and increased efficacy. At this time of year, both woody and herbaceous invasive plants have typically completed their grown developmental stage and are beginning to send nutrients and carbohydrates back down to the rooting system for over wintering. It is this time of year when the herbicides being used (triclopyr & glyphosate based products, see Table 2) are translocated throughout the plant and into the roots thus increasing the percent mortality of the target species. A secondary benefit to late season applications is that the dryer weather reduces tick populations and the risk of contracting Lyme disease.

Trade Name of Pesticide	Amount of A.I. in Product	EPA Registration #	No. of Acres	% Solution	Total Amount of Product Used
Roundup Pro Concentrate	50.2%	524-529	~43 Acres	5%	3.83 gallons
Garlon 4 Ultra	60.45	62719-527	~7,000 woody stems	23%	2.13 gallons
Pathfinder	13.6	62719-176	Spot Applications	13.6%	2 gallons

Table 2

The treatment methods used in 2013 were the same as those used during the 2012 season, which included both Low Volume Basal Bark (LVBB) for most woody species; and Foliar Spray (FS) for herbaceous species and Japanese barberry. Table 3 lists the species treated and application method used:

Table of invasive species treated and application method used

Common name	Scientific name	*Plant type*	*Application method*
Japanese barberry	*Berberis thunbergii*	*Woody*	*FS*
Oriental bittersweet	*Celastrus orbiculatus*	*Woody*	*LVBB*
Autumn olive	*Elaeagnus umbellata*	*Woody*	*LVBB*
Burning bush	*Euonymus alatus*	*Woody*	*LVBB*
Glossy buckthorn	*Frangula alnus*	*Woody*	*LVBB*
Perennial pepperweed	*Lepidium latifolium*	*Herbaceous*	*FS*
Honeysuckle	*Lonicera spp.*	*Woody*	*LVBB*
Japanese knotweed	*Polygonum cuspidatum*	*Herbaceous*	*FS*
Common buckthorn	*Rhamnus cathartica*	*Woody*	*LVBB*

Table 3

2013

Japanese knotweed – ~43 acres (*this is an approximation due to most sites having numerous individual populations of knotweed distributed throughout thus making it very difficult to calculate a precise total*) were treated using Roundup Pro Concentrate (Glyphosate) at 5% solution applied as a foliar spray. The applications were done using both a backpack mist blower and a backpack pump sprayer treating the knotweed just after flowering. The treatments included unmanaged populations as well as follow-up applications to a few knotweed stands that didn't die off completely from the previous year's work. In these instances, approximately 85-95% of the knotweed did not regrow, but a few managed to survive. Some of these plants did not show any symptoms of herbicide impacts whereas some did. The ones that were symptomatic after being treated the previous year were stunted, deformed and had smaller foliage, see photos below and the one at the top of the following page:

One issue that I encountered the previous year in sites with numerous stands of knotweed was disorientation as to what I treated and what I didn't. To resolve this problem I applied a small dot of fluorescent orange spray paint onto a few leaves of each clump. Most of these orange dots were applied facing the roadway so that they were readily visible when driving by later in the season.

Woody Invasive plants –Approximately 7,000 woody invasive stems were treated using the low-volume basal bark banding method. The first few applications were experimental using Pathfinder II, which is a premixed triclopyr based herbicide with 13.6% a.i.. However, most of the control work utilized Garlon 4 Ultra (Triclopyr). To increase the success from the previous year the application rate was increased from 20% (used during 2012) to 22% solution. The diluent used was vegetable based Canola oil.

Findings – Observations of the effects of the herbicide applications conducted during the 2011 & 2012 indicated that the treatments were very successful. The impacts to Japanese knotweed appeared to be in the range of 85-100% after just one application. Secondary follow-up applications were conducted for those plants that survived the first round. These follow-up applications did not require a lot of effort or time to achieve.

The success rate appeared to be higher for the woody invasive shrubs being closer to 95-100% control from one application. Oddly, a few of the treated Autumn olive plants exhibited signs of regrowth during the spring following the application from the previous year, but shortly thereafter the foliage turned yellow and died. It was also observed that several Autumn olive retained a few living branches the second year, but as the season progressed these branches soon died off, see photo below:

Autumn olive treated in 2012 with some foliage reoccurrence in 2013
(*Note: This and most of the other Autumn olive that exhibited regrowth were found completely dead in 2014*)

In addition, some of the Autumn olive plants that also appeared to have living stems/branches were found to be completely dead, but amongst the dead stems a few new Autumn olive were found growing at the base. These were treated in 2013.

Conclusion – The herbicide aspect of this IPM invasive plant control program is making a significant impact to the overall population of invasive plants on a statewide level. Not only is it making a direct impact, but it also serves to bring awareness and interest in invasive plant control from communities, municipalities, state agencies, environmental interest groups and the general public. In total, approximately 7,000 woody invasive plant stems were sprayed using low-volume basal bark banding with 95-100% success; and approximately 43 acres of Japanese knotweed were treated using foliar spray with approximately 85-100% success.

Photo showing the Scrutton Pond Rd site in Barrington pre-herbicide application.

Submitted by:
Douglas Cygan
Invasive Species Coordinator
New Hampshire Department of Agriculture,
Markets & Food
Pesticide Applicator's License # S-1606883N
(603) 271-3488
S:\Plant Industry\Doug Shared\Pesticide Use-Invasive Control\DOT\2013\Pesticide Usage Reports