

# Survey of Terrestrial Invasive Plants along Scrabble Creek

Prepared by Kendra Luta



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## Introduction

Three cold water creeks, Finch, Cold and Shanty, flow through Grass River Natural Area into Grass River, continuing through the Elk River Chain of Lakes and eventually reaching the Grand Traverse Bay. Finch Creek was the first stream to be surveyed for terrestrial invasive species during 2016-17.

Two primary tributaries, Scrabble Creek and Crow Creek, flow into the 4.5 mile long Finch Creek. In order to obtain a clear picture of the terrestrial invasive threats to Finch Creek it is necessary to also survey these tributaries. A survey of terrestrial invasive species along Scrabble Creek was conducted in August 2017. The data collected will be compiled with the Finch Creek survey to be used as the first source data that will be used to determine long-term monitoring and management plans for terrestrial invasive wetland plant species for GRNA.

## Target Species

Target species were compiled from a list of invasive species determined by Michigan Natural Features Inventory (MNFI) and the Michigan Terrestrial Invasive Species State Management Plan to be the most threatening to Michigan's biodiversity. The list was narrowed and prioritized based on the ecological terrain that would be covered i.e. stream banks, wetlands and cedar swamp. Table 1 lists all of the target species for this survey.

Table 1. Target terrestrial invasive species and Michigan priority level

<b>Common Name</b>	<b>Scientific Name</b>	<b>Priority Level</b>
Dame's Rocket	<i>Hesperis matronalis</i>	High
Eurasian Phragmites	<i>Phragmites australis</i>	Restricted
Garlic Mustard*	<i>Alliaria petiolate</i>	High
Glossy Buckthorn	<i>Fragula alnus</i>	High
Japanese Barberry	<i>Berberis thunbergii</i>	High
Japanese Stiltgrass	<i>Microstegium vimineum</i>	Watchlist
Knotweed, Giant	<i>Polygonum schalinense</i>	High
Knotweed, Japanese	<i>Polygonum cuspidatum</i>	Prohibited
Mile-a-Minute	<i>Polygonum perfoliatum</i>	Watchlist
Multiflora Rose	<i>Rosa multiflora</i>	High
Narrow-leaf Bittercress	<i>Cardamine impatiens</i>	High
Narrow-leaf Cattail**	<i>Typha angustifolia</i>	-----
Purple Loosestrife	<i>Lythrum salicaria</i>	Restricted
Reed Canarygrass	<i>Phalaris arundinacea</i>	High
Thistle, Bull	<i>Cirsium vulgare</i>	Prohibited
Thistle, Canada	<i>Cirsium arvense</i>	High
Thistle, European Swamp	<i>Cirsium palustre</i>	High

\*was not surveyed when flowering

\*\*does not have a priority level due to hybridization with native cattails

## Field Surveys

The invasive plant survey methods used in this inventory were established by the Midwest Invasive Species Information Network (MISIN). All information about the invasive species that were found was documented using the categories established by MISIN. The survey took place over the course of two weeks in August 2017. The survey started at the mouth of Scrabble Creek where it flows into Finch Creek and proceeded to the headwaters. The creek runs through three private properties in addition to GRNA property. All private landowners were contacted before conducting the survey.

Two surveyors walked in the creek as well as along the edges, surveying approximately 20 feet on either side of the stream bank. Occurrences of invasive plants were documented by marking data points with a GPS; area and density were quantified using protocols established by MISIN, found in Table 2.

Table 2. Area and density codes for invasive species infestations determined by MISIN

<b>Area Code</b>	<b>Area Description</b>	<b>Density Code</b>	<b>Density Description</b>
1	Individual/several	1	Sparse
2	Less than 1,000 ft <sup>2</sup>	2	Patchy
3	1,000 ft <sup>2</sup> to 0.5 acre	3	Dense (greater than 40% of area)
4	0.5 acres to 1 acre	4	Monoculture (nearly 100% of area)
5	More than 1 acre		

## Data Processing

The data points of the invasive species observed were taken with a Garmin GPS and downloaded into a GIS project file using ArcGIS 10.5. Distribution maps were generated based on species, area and density. The species are indicated by the color of the icon. Area of the distributions are identified by increasing icon sizes, and the density is distinguished by the color shade of the icon; the darker the shade, the more dense the infestation.

## Results

Four of the seventeen target species were identified along Scrabble Creek with a total of 15 separate occurrences (Table 3). Autumn olive made up 60%, bull thistle made up 20%, multiflora rose made up 13% and Canada thistle comprise 7% of the total occurrences. (Figure 1).

Table 3. Area and density of identified species

Species	Density	Area	Occurrences
Autumn olive	1	1	8
	2	1	1
Bull thistle	1	1	3
Canada thistle	3	2	1
Multiflora rose	1	1	1
	1	2	1

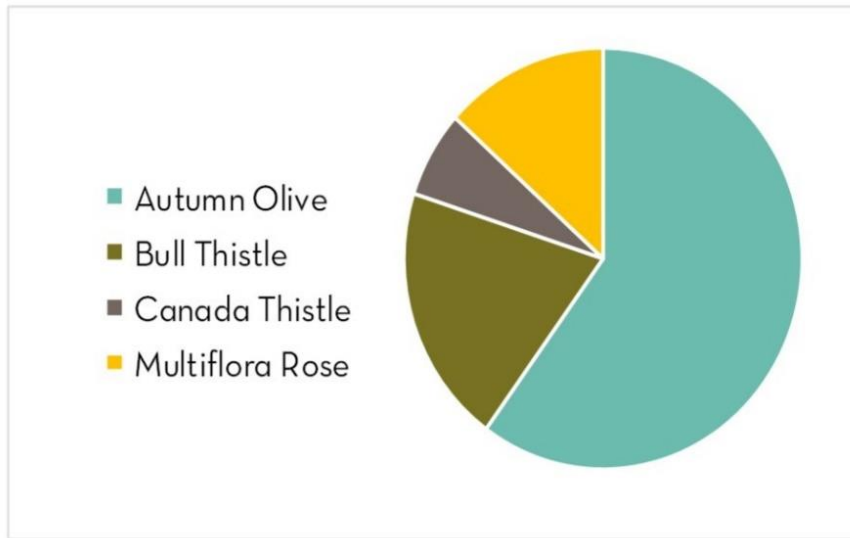


Figure 1. Distribution of identified species along Scrabble Creek

Twelve of the fifteen sites were located between the mouth of Scrabble Creek and Alden Highway. Three occurrences were identified between Alden Highway and the headwaters, two of which were autumn olive and one was Canada thistle (Figure 2).

Eight of the nine occurrences of autumn olive were single plants in a confined area. There was one site that had a dozen small plants in a small area. All three bull thistle sites contained single or sparse densities in a confined area. Multiflora rose was found at two sites, one with three small plants and one with two large shrubs. One large infestation of Canada thistle was identified (area of 3, density of 2) under powerlines in the right-of-way between Alden Highway and the headwaters (Figure 3).

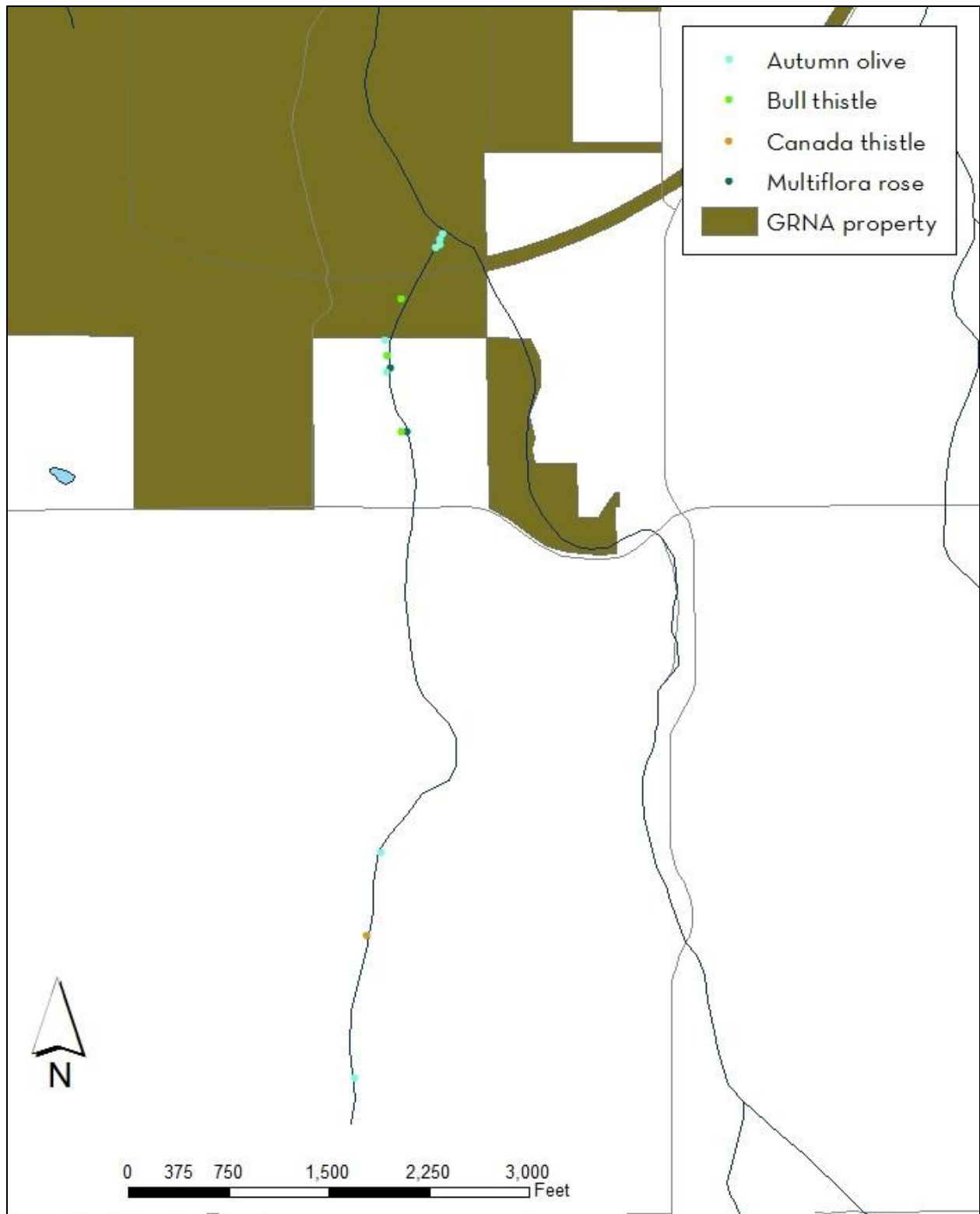


Figure 2. Location of sites with positive invasive identification along Scrabble Creek.



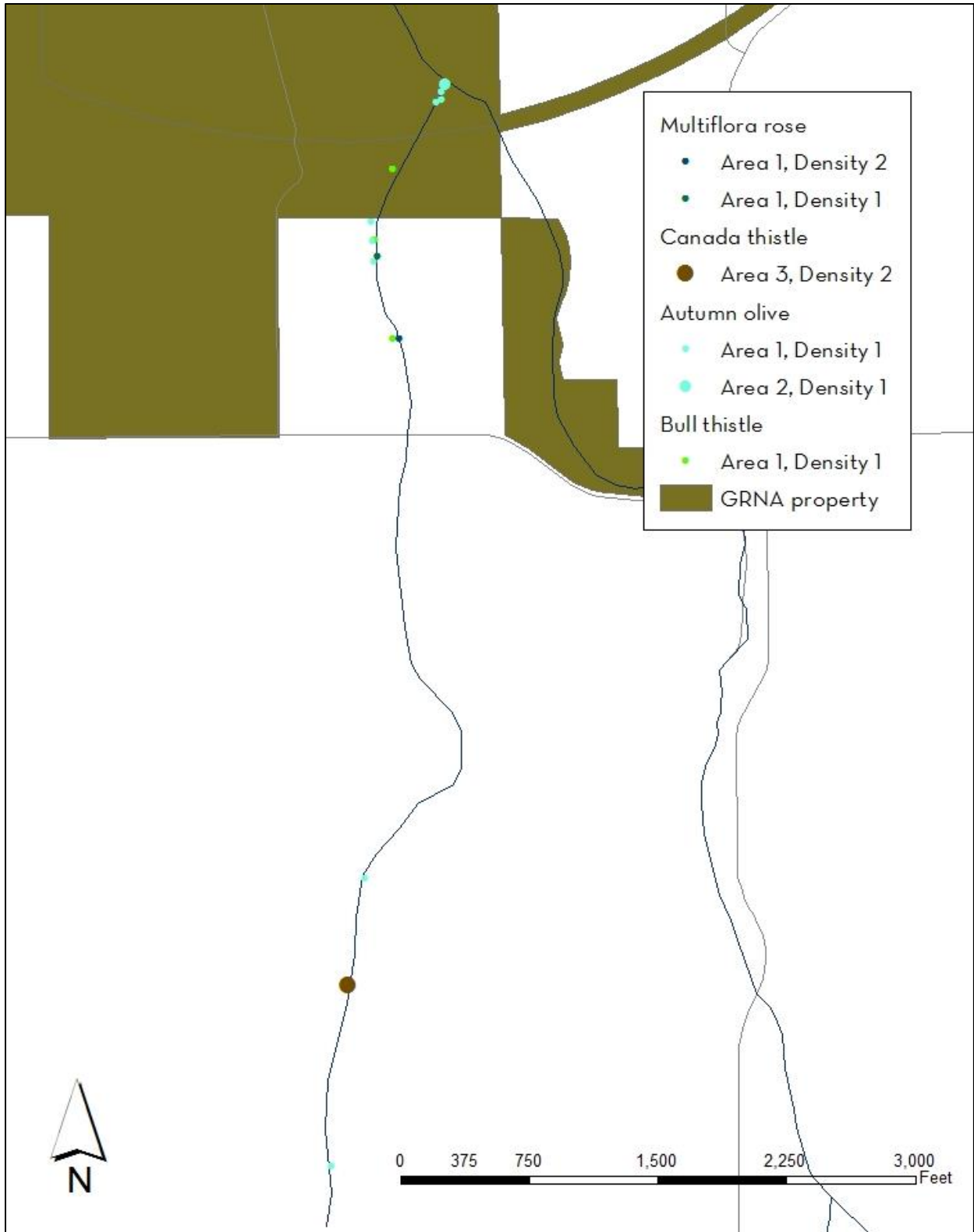


Figure 3. Area and density of all identified invasive plants along Scrabble Creek.

## Recommendations

With the exception of the large infestation of Canada thistle along the right-of-way, all identified sites along Scrabble Creek are early detection locations. It is recommended that all sites on GRNA property are immediately controlled and set up on an annual monitoring regiment. All private landowners that have sites on their property should be given a copy of this report and be provided resources for them if they choose to implement control methods.