

Kleinstuck Preserve Purple Loosestrife Monitoring

Study conducted by: Kaldis Grants

Objectives:

- To identify the size of PL population/spread
- To detect establishment and identify continued spread of the biocontrol PL beetle,
- To assess the impact of the beetle on purple loosestrife spread
- To identify change in herbaceous vegetation relative to change in purple loosestrife density

Background:

Purple loosestrife, *Lythrum salicaria*, is an invasive species brought to North America from Europe in the 1800's. Purple loosestrife has the ability to quickly take over wetland habitats, and poses a great danger to the ecosystems biodiversity.

Kleinstuck preserve is a 50 acre woodland with a central marsh, located in the city of Kalamazoo Michigan. Purple Loosestrife has invaded the wetland community of Kleinstuck.

A biocontrol in the form of the purple loosestrife beetle, *Galerucella pucilla*, has been implemented in the site. Purple loosestrife beetles live and feed on purple loosestrife. While they do not completely eliminate the loosestrife they can severely limit its growth and reproductive ability.

No previous studies have been conducted on the purple loosestrife in Kleinstuck. However it is known that purple loosestrife was not found at the preserve five years ago.

Relationship to Refuge Resources:

This study is important because it will monitor the effect that the beetle biocontrol has on the purple loosestrife and any change in herbaceous vegetation relative to changes in loosestrife. Purple loosestrife is one of the most aggressive and dangerous invasives found in Kleinstuck. This study will help monitor its vitality and contribute to the overall restoration effort being conducted by the Stewards of Kleinstuck and WMU.

Project Description:

This study is being conducted under the guidance of Tyler Bassett, Restoration Botanist at the Native Connections, who is monitoring the plant species of Kleinstuck and Cari DeLong, Natural Areas Manager, Western Michigan University,

The design and methods of this study are in accordance with *Cornell University's Ecology and Management of Invasive Plants Programs purple loosestrife monitoring database*. A description, including methods, can be found at www.InvasivePlants.net – Monitoring Protocols – Purple Loosestrife. A copy of the Cornell University monitoring methods is included at the end of this report.

Beetle Release/ Preliminary Site Assessment:

Purple loosestrife beetles were collected from local wetlands and released on two separate occasions. Roughly 250 adults, were released at section 13 (see management map), in June of 2009. A second release, at the same location, was done in May of 2010, which consisted of 50 adults and about 1000 larvae.

Due to the early release of beetles no baseline data or observations about the extent of PL population are available for the period before the biocontrol release. Some aerial photographs taken by Jim Ratliff exist which may be used if necessary for a general assessment of the area covered by PL plants.

The first visual survey of PL beetle existence and damage was done June 2010. Using a sit-on kayak and waders, the overall spread and condition of loosestrife was inspected. The visual survey provided information for determining the overall distribution of purple loosestrife as well as helped to determine the approach for plot installation and data collection. In one season evidence of the beetles feeding on the foliage of the loosestrife can be seen throughout the marsh.

Methods:

A total of 22 plots were randomly chosen along the inner berm of the marsh, where loosestrife is most abundant. The plot locations were first recorded on a GPS unit and marked with easily visible fluorescent tape. On a second visit, a one meter squared grid, constructed from ¾" PVC pipe was used to establish the dimensions for each previously selected plot location. The grid was oriented so that one side of the grid was facing north. Two 10' long ¾" PVC segments were driven in to the southwest and north east corners of each plot location. These poles would serve as a permanent marker for the plot locations and allow for easy addition of the grid used during data collection.

Fall Monitoring : Purple loosestrife performance

2010: September 26-27

- Before collection began, site name, date, general weather pattern (sunny, overcast, rainy, humid), temperature, time, and the names of the observers were recorded.
- The portable 1m² grid was slid over the plot posts for each of the 22 plot locations.

- Percent cover of purple loosestrife and cattails was recorded using an established interval scale (<1% cover; 2-5% cover, and in 10% increments thereafter i.e.; >5-15%, >15-25%, etc) counting only stems that originated in the grid.
- The total number of loosestrife stems (taller than 20 cm) and cattail stems were counted.
- The total number of loosestrife and cattail inflorescence were recorded.
- Four separate measurements were taken from each of the five tallest loosestrife stems:
 - a) Stem height.
 - b) Number of inflorescences on that stem (including all side branches).
 - c) The length of the longest inflorescence.
 - d) The number of flower buds in the central 5cm portion of each stems longest inflorescence.
- No additional vegetation abundance was recorded

Spring Monitoring will follow in 2011