
Attachment 37 to PLA-6219
Purple Loosestrife Control Program in the
Susquehanna Riverlands and Montour Preserve.
1999 Annual Report. November 1999

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**PURPLE LOOSESTRIFE CONTROL PROGRAM
IN THE SUSQUEHANNA RIVERLANDS
AND MONTOUR PRESERVE**

1999 ANNUAL REPORT

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INTRODUCTION

Beginning in 1997, Ecology III, Inc., was contracted by PP&L, Inc., Susquehanna Riverlands management personnel to control the exotic plant, purple loosestrife, *Lythrum salicaria* L., in the Riverlands Recreational Area and the Wetlands Nature Area. Additionally in 1998, PP&L personnel directed us to expand the control program to include their Montour Preserve facility. Also in 1998, another exotic plant was discovered in the Riverlands/Wetlands areas, *Polygonum perfoliatum*, L. or the mile-a-minute weed, and the control program was again expanded to combat the spread of this species. This report presents the efforts and findings of the program during 1999.

AFFECTED AREAS

Susquehanna Riverlands and Wetlands Nature Areas

When the program began in 1997, purple loosestrife had already invaded numerous areas within both the Riverlands and Wetlands (Ecology III, Inc. 1997). Our preliminary inspection in 1999 revealed that many of those same areas still contained loosestrife, but the abundance of the plant had been greatly reduced from that of previous years. We observed some pioneer plants in locations where loosestrife had not previously been seen: one location was the western shore of Lake Took-A-While, and another was at the northern-most edge of the Riverside Trail. New sites such as these demonstrate the continued ease at which loosestrife can invade previously uninfested areas of the park. While loosestrife abundance is declining in Riverlands/Wetlands areas, the opposite was true for mile-a-minute weed. This species showed a drastic, if not alarming, increase in population size since 1998. And the range of this species seems to have expanded

greatly as well. Large patches of the weed were observed in the vicinity of the park laydown area, and the small woodland nearby was almost completely enveloped by the weed. Other large areas infested with the plant were found near the Great Warriors Path in the Wetlands and near the gas-line on the Riverside Trail.

Montour Preserve

The areas containing loosestrife at the Preserve were the same ones noted in 1998, namely the spillway of the lake and near the fishing pier (Ecology III, Inc. 1998). However, the abundance of the plant had precipitously declined in both these areas since the 1998 season. No new regions of loosestrife outbreak were noted. The Preserve has yet to be inspected for the presence of mile-a-minute weed.

METHODS

As in previous years, the bulk of our control efforts centered on the use of Rodeo, the aquatic formulation of this glyphosate herbicide. This has so far proven to be an effective and cost-efficient method for loosestrife control. This is the second year in which there were no areas in either the Riverlands/ Wetlands that required broadcast spraying of loosestrife; density of the plants were such that spot-spraying sufficed for herbicide application. The herbicide was applied to loosestrife plants using a backpack sprayer that permitted relatively precise application of the compound. This selective application limited damage to non-target plants, and in most instances the treated areas were indistinguishable from untreated areas.

An experimental spraying of mile-a-minute weed was done in limited areas. Although the spray was effective, the collateral damage to non-target plants was higher for mile-a-minute spraying than for purple loosestrife spraying. This occurred because mile-a-minute often grows atop other vegetation and when it is sprayed some of the herbicide falls onto the plants beneath it.

RESULTS

Susquehanna Riverlands and Wetlands Nature Area

The overall abundance of purple loosestrife in the Riverlands and Wetlands Nature Areas continues to decline. The large, dense blocks of loosestrife observed in the Wetlands areas in 1997 no longer exist. Those areas that were most dense in previous years have already shown promising regeneration of native plant species. The number of loosestrife locations in the park, however, is about the same or perhaps slightly higher than was observed in 1997. This is not surprising given the great source of loosestrife seed growing nearby along the shorelines of the Susquehanna River, which facilitates the spread of pioneer loosestrife plants throughout the park. The ground-pepper sized seeds (2.5 million from a single mature plant) are transported by a number of vectors including: fur and feathers of mammals and aquatic birds, water, wind, truck tires, and shoes. With careful monitoring, these pioneer plants can be stopped before large outbreaks occur, and this can sometimes be done using simple mechanical removal.

One particularly problematic area for loosestrife control has been in the Wetlands Nature Area. The marsh north of the Beaver Pond and west of the Canal has been, and continues to be, very difficult to access. This area currently contains the largest extant population of loosestrife within the Riverlands/Wetlands boundaries. Generally, this marsh is too wet to enter by foot and too shallow to navigate with a boat. In 1999 we were more successful in spraying loosestrife in this area because of the drought. Low water conditions in July made it possible to walk into the marsh and spray many plants that otherwise would have been out of our reach. Unfortunately, this low water also prevented our access to other portions of the marsh by boat, a technique we used in 1998. At present there is no easy answer for loosestrife control in this area. We expect that the loosestrife in this marsh will only increase in abundance and density without a control effort, and therefore this is an area of special concern for the 2000 season.

The rapidity in which the mile-a-minute weed spread throughout the Riverlands and Wetlands is startling. In areas where there was little evidence of this plant in 1998, e.g., the small wetland near the Riverlands laydown area, there was a great abundance of the weed this year. The plant is an annual propagated only from seed, so we expect that its expansion is perhaps due to animal vectors dispersing the seed. The blue, fleshy, pea-sized fruit is conceivably ingested by animals such as birds and small mammals that may then inadvertently spread the seed in their scat. Herbicide treatment will likely be the most effective agent of this weed's control, but careful monitoring in the early spring may improve the control of smaller infestations by mechanical removal.

Montour Preserve

It was very satisfying to see the results of last year's control effort at Montour Preserve. Because this area was sprayed before loosestrife populations had grown very large, these efforts led to decisive results. During our initial 1999 inspection, we observed greater than a 70% reduction in population size since 1998. With continued monitoring and control, we expect that purple loosestrife abundance and density will not match that initially observed at Susquehanna in 1997.

PROJECTIONS AND RECOMMENDATIONS

The program thus far has been very successful in the control of purple loosestrife. With continued monitoring and control, the overall abundance of this alien plant species should decline. It is unlikely that these species will ever be completely eradicated from the infested areas, because of nearby seed sources.

Projections for the control of mile-a-minute weed are not as promising as those for loosestrife. If the increase in its abundance from last year represents a trend within the park, then significant amounts of the plant may soon be found on these PP&L properties.

Non-target damage to native plant species during spraying, particularly for mile-a-minute spraying, is an ongoing concern of ours. This damage could perhaps be minimized with more selective herbicides. For example, we recently learned about an experimental compound (Renovate) that is selective for broad-leaf vegetation while sparing monocots. An experimental use permit is required for its application, and we are investigating the possibility of using this herbicide in the control program. In addition, there are some pre-

emergent herbicides that can be applied to areas heavily infested with mile-a-minute. These compounds may help to minimize damage to non-target plants. Currently, there are no known biological controls for mile-a-minute weed, so chemical controls will continue to be the most practical method for this weed in the foreseeable future.

There are, however, some biological controls for purple loosestrife and these agents are likely to be viable long-term methods of control for loosestrife. The U.S. Department of Agriculture has so far approved for release four host-specific insect species for the control of loosestrife. These include a flower-feeding weevil (*Nanophyes marmoratus*), a root-mining weevil (*Hylobius transversovittatus*), and two leaf-eating beetles (*Galerucella californiensis* and *Galerucella pusilla*). Combinations of these beetles have so far been released in at least 27 states, including Pennsylvania. We have discussed beetle release in the state with an official from the Pennsylvania Department of Agriculture, who provided us with information concerning release sites throughout the commonwealth. Thus far, the nearest release sites to the Riverlands/Montour Preserve areas have been in Dauphin County (Harrisburg and Hershey). In addition, the official offered to travel to our area in spring 2000 to review it as a possible candidate site for beetle release. We believe that it would be to PP&L's benefit to embrace such an action. And if for some reason this area would not meet their criteria as a state release site, PP&L then has the option to secure beetles from outside sources for release in the park. Should PP&L, Inc., lands become release sites for the beetles, the long-term benefits of these insects would be experienced not only by PP&L, but eventually by all neighboring wetlands infested with loosestrife, including the vast area of Susquehanna River shorelines. This

would be another in a long series of demonstrations of PP&L's commitment to environmental stewardship and willingness to form partnerships in environmental causes.

REFERENCES

Ecology III, Inc. 1997. Purple loosestrife control program in the Susquehanna Riverlands. Prepared for Pennsylvania Power & Light Company, December 1997.

Ecology III, Inc. 1998. Purple loosestrife control program in the Susquehanna Riverlands and Montour Preserve. Prepared for PP&L, Inc., November 1998.