

Executive Summary

The Raystown Branch of the Juniata River (Figure 1) has a rich diversity of history, natural resources, good agricultural land, and many recreational opportunities. From Allegheny Ridge, the Eastern Continental Divide, the river carves its way through Bedford County, touches the northwestern edge of Fulton County then flows north to Huntingdon County where it enters into the Juniata River. The river is both scenic and threatened. One issue of major concern is the presence of invasive plant species. To date, there has not been a collaborative effort to control invasive species within forest, aquatic, and agricultural ecosystems of the 964 square-mile Raystown Watershed in southcentral Pennsylvania. Many individual landholders are struggling with crop pests and invasive plants, therefore the Raystown Riparian Vegetation Conservation Plan was developed to approach this concern on a watershed-wide basis.

In the development of this plan, the first steps were to assess the distribution and impacts that noxious weeds and invasive plant species have on the ecosystems found within the Raystown Branch of the Juniata Watershed and identify the best control and prevention techniques for these species. In order to determine the threat that the 13 PA noxious weeds and 22 invasive species identified have on the Raystown Watershed, site assessments were conducted on land enrolled in the Conservation Reserve Enhancement Program (CREP), Conservation Reserve Program (CRP), Conservation Securities Program (CSP), and private and public lands with streambank fencing or buffers installed. Through press releases, flyers, public input meetings, website, and an online forum, landowners were asked for permission to conduct site assessments in order to gather the data necessary to determine the species present, density of species present per field, and location of the populations using GPS and mapping. Thirty-one landowners encompassing 2,866 acres participated in these field assessments. This data was not only used for the development of the Raystown Riparian Vegetation Conservation Plan but also to develop individualized landowner management plans. Natural Biodiversity provided each landowner with technical assistance in weed identification and control. Through site assessments, a variety of invasive species and noxious weeds were identified as having significant populations in the watershed. The most abundant species include: multiflora rose (*Rosa multiflora*), bull thistle (*Cirsium vulgare*), autumn olive (*Elaeagnus umbellata*), curly dock (*Rumex crispus*), bush honeysuckle (*Lonicera* spp), and spotted knapweed (*Centaurea biebersteinii*). The least abundant species that were located include: common reed (*Phragmites australis*), golden bamboo (*Phyllostachys aurea*), Johnson grass (*Sorghum halepense*), jimson weed (*Datura stramonium*), shattercane (*Sorghum bicolor*), and Norway maple (*Acer platanoides*).

Not only do invasive species and noxious weeds invade agricultural fields, but they also have a detrimental impact on public recreational lands including State Parks. During the course of the study, site assessments were conducted at four state parks: Blue Knob, Shawnee, Trough Creek, and Warriors Path. While conducting site assessments at the state parks, the most abundant species present include: multiflora rose, Japanese knotweed (*Fallopia japonica*), giant knotweed (*Fallopia sachalinensis*), Japanese barberry (*Berberis thunbergii*), autumn olive, bush honeysuckle, and Japanese stiltgrass (*Microstegium vimineum*). A small monoculture of the state noxious species jimsonweed (*Datura stramonium*) was also identified at Shawnee State Park. The relative threat for each invasive species was determined based on the extent of the invasive species or noxious weed present, its ecological impact, its potential to spread, and the

difficulty for control. Multiflora rose, bull thistle, autumn olive, Canada Thistle (*Cirsium arvense*), and bush honeysuckle were found to pose the greatest threat to the agricultural lands, while garlic mustard (*Alliaria petiolata*), tree-of-heaven (*Ailanthus altissima*), and Japanese barberry posed the greatest threat to the forest ecosystem. Purple loosestrife (*Lythrum salicaria*), Japanese knotweed, common reed, and reed canary grass (*Phalaris arundinacea*), however, posed the greatest threat to aquatic ecosystems.

Table 1. Twelve High Threat Species of the Raystown Watershed

Scientific Name	Common Name	Ecosystem Affected
<i>Cirsium vulgare</i>	Bull Thistle	Agriculture
<i>Cirsium arvense</i>	Canada Thistle	Agriculture
<i>Rosa multiflora</i>	Multiflora Rose	Agriculture
<i>Elaeagnus umbellata</i>	Autumn Olive	Agriculture
<i>Alliaria petiolata</i>	Garlic Mustard	Forest
<i>Ailanthus altissima</i>	Tree-of-Heaven	Forest
<i>Berberis thunbergii</i>	Japanese Barberry	Forest
<i>Phalaris arundinacea</i>	Reed Canary Grass	Aquatic
<i>Lythrum salicaria</i>	Purple Loosestrife	Aquatic
<i>Fallopia sachalinensis</i>	Giant Knotweed	Aquatic
<i>Fallopia japonica</i>	Japanese Knotweed	Aquatic
<i>Phragmites australis</i>	Common Reed	Aquatic

Control efforts within the Raystown Branch Watershed should focus on these twelve high threat species, which were the most abundant species identified as posing the greatest threat within their given ecosystems and should be a high priority for control. However, species such as jimsonweed, mile-a-minute (*Polygonum perfoliatum*), shattercane, and Johnsongrass were also identified at a few sites. Although each of these species was only found at minimal sites, the containment/ prevention of spread of these species should be a top priority due to their presence on the PA noxious weed list and their ability to spread rapidly. For example, mile-a-minute has the ability to produce numerous seeds that remain viable for seven to nine years, therefore continual monitoring of uninfested locations and areas where control has begun are critical for successful eradication. Golden bamboo was also identified at one location within the watershed and is forming a dense thicket, ultimately blocking the sunlight from plants potentially growing beneath. Early control measures of small infestations keep populations to a minimum and are most cost efficient; therefore it is recommended as a high priority.

During site assessments, an inventory of the invasive species and noxious weeds was completed and compiled. Through the determination of the occurrence, distribution, and threat of nonnative plants, strategies for control have been to remove high threat species and to maintain weed free areas. With sufficient planning, monitoring, and a rapid response program, the detrimental impact that invasive plants have on native plant species and their ecosystems can be minimized.

This management plan addresses the extent of invasive plant and noxious weed infestations occurring throughout the Raystown Watershed. Included in this plan are the plants that were identified, control recommendations for each species, species location maps, partners, education and outreach, restoration techniques, and funding sources for potential future implementation.

The plan is a result of a collaboration of individuals, non-profit, state, federal, and local agencies. This management plan is meant to provide recommendations on how to control and prevent the spread of invasive species and noxious weeds. Part of this project was to provide technical assistance to the participating landowners who granted permission to access their property. The funding for this project was provided by the U.S. Department of Agriculture's Natural Resources Conservation Service.

Figure 1. Map of the Raystown Branch Watershed

