DEC Invasive Species Eradication and Control Grant FINAL REPORT

W.N. Harman, H.A. Waterfield and M.F. Albright

**Site description:** 40-acre wetland in the City of Oneonta draining to the Susquehanna River. In 2008, water chestnut occupied an area of approximately 4 acres of open-water. Growth was very dense. Purple loosestrife was the dominant emergent plant in the wetland.

**Water Chestnut Eradication Strategy:** Herbicide applications (2, 4-D) in densely populated areas, hand-pulling of satellite populations prior to fruit-production each year. Additional water quality and nutrient data were collected in order to assess the response in general water quality conditions to the herbicide application.

**2008-2011 Activities:** Herbicide applications to control this population were conducted prior to this grant in 2006 and 2007 and continued with funding from this grant in 2008, 2009, and 2011 (Figure 1). Hand-pulling of satellite patches and individual plants was done each year via canoe (Figure 2).

**Assessment of success:** the combination of herbicide treatment and hand-pulling of plants was hugely effective in reducing the population from 2007 to 2010. Native floating-leaved plants were rebounding (Figure 3). Logistical complications resulted in a “missed” herbicide application during the 2010 growing season (described below) and subsequent rebound of the population (also see Figure 1). Following the 2011 application a second growth of plants was observed in mid-August. These plants were also producing fruits; a major hand-pulling event was held in mid-September, though growth was so prolific that all harvest off all plants was not achievable. Spring 2010 assessments will give insight into the viability of these fruits produced late in the growing season.

**Problems encountered:** coordination of efforts among multiple parties proved challenging. The herbicide application permitting process was chronically delayed by the landowner; thus annual permits were not approved until late in the season, following the production of fruiting bodies. Nuts were somewhat advanced in development and it was unclear whether or not the herbicide treatment would be effective or successful; the 2010 herbicide application was postponed until 2011, with the intent being to treat earlier in the season to ensure treatment before fruit production. This missed herbicide application resulted in high fruit production in 2010 and vigorous growth of individuals and expansion of moderately-sized patches were observed in 2011. Though the 2011 application area was larger than in previous years (Figure 1), the density of plants in this area was substantially reduced from earlier years (Figure 4).

Hand-pulling efforts have been very successful in reducing the spread of water chestnut to areas away from the main, dense patches, though would be more appropriate for a water body that is either high-profile or has a larger public base to draw from in soliciting volunteers.

**Purple Loosestrife Control Strategy:** *Galerucella* spp. beetles were released in the wetland to serve as a biocontrol agent. *Galerucella* are leaf-eating beetles that consume only purple loosestrife at all life stages.

**2008-2011 Activities:** *Galerucella* spp. were introduced to the marsh in 2006. In 2008, purple loosestrife in the northeastern portion of the marsh was heavily damaged by the beetles and produced few inflorescences; plants in the southwestern portion of the marsh remained healthy. In 2009 dead standing loosestrife could be seen from the railroad access; plants were heavily damaged throughout the wetland and inflorescences were rare. In August, new shoots of purple loosestrife could be seen growing up through standing dead loosestrife stems from 2008. In 2010, loosestrife was damaged throughout the wetland, evidence that beetle distribution was increasing within the area. In 2011, the beetles were observed in early-summer, though damage to loosestrife was reduced and the plants were able to produce flowers. This was also the case elsewhere in the county where loosestrife is controlled by *Galerucella*.

---

1 Final report to NYS DEC for a 2007-2011 grant for water chestnut eradication and purple loosestrife control activities.
Figure 1: Area of water chestnut patch in 2007 and 2008; herbicide application areas in 2009 and 2011. Broken pattern in 2011 Application Area represents a drastic reduction in density of plants.

Figure 2. Example of isolated plants and patches targeted for hand-pulling efforts (Left) and canoes loaded with plants during a hand-pulling event (right).
Figure 3. Native floating-leaved plants in 2010 (left) and 2011 (right) making a come-back in the open water areas of the marsh. In 2011, the expanded water chestnut patch included areas that were dominated by rebounding native plants in 2010.

Figure 4: Main water chestnut patch in 2006 (left) and 2011 (right).