

# Ludwigia Control as a Precursor to Restoration: Progress and Challenges

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Draining 254 square miles, the Laguna de Santa Rosa is the second largest freshwater wetland in coastal northern California and is the largest tributary to the Russian River. It is also the river's most densely populated sub-basin, a factor that has led to significant environmental pollution. One of the manifestations of this pollution and accompanying changes to the Laguna's physical structure is a massive invasion by the non-native aquatic plant *Ludwigia* spp. The Laguna de Santa Rosa Foundation recently completed a three year effort to control the plant in two key locations slated for restoration. Control locations are outlined in yellow.



Laguna de Santa Rosa Foundation

## Target Invasive Weed

*Ludwigia hexapetala* and *L. peploides* ssp. *montevidensis* are two aggressive non-native species invading freshwater wetlands in areas of California including Sonoma County's Laguna de Santa Rosa.



## Objectives

1. To reduce *Ludwigia* in target areas to a minor rather than dominant member of the community.
2. To enable more efficient and effective mosquito control.
3. To increase understanding of herbicide and mechanical removal as viable control methods.

## Methods

1. Herbicide Application - glyphosate and triclopyr applied via airboat, MarshMog, and truck each summer between 2005-2007.
2. Treated vegetation left in place 3-5 weeks then removed using aquatic harvesters and long-reach excavator.
3. Biomass disced into nearby farm fields

## Results

Shallow Channel  
(herbicide followed by mechanical removal)



July 2005  
Pre-Treatment

Deep Channel  
(herbicide followed by mechanical removal)



Shallow Floodplain  
(herbicide only, mechanical removal not feasible)



September 2007  
Immediately following completion of 3 seasons of control work



July 2008  
Ten months following completion of control work



## Conclusions

1. Although both glyphosate and triclopyr are systemic herbicides, neither acted systemically. The fact that glyphosate adsorbs readily to soil particles and becomes inactive makes it a poor herbicide choice if conditions require equipment to drive over plants in muddy water. Triclopyr killed above ground tissue too quickly.
2. Spraying dense infestations without accompanying removal will result in rapid regrowth and severe depressions in dissolved oxygen. Spraying alone may be effective following at least one year of mechanical removal.
3. Within the Laguna, the physical conditions, particularly water depth, strongly influenced the duration of control effects. Deeper channels exhibited far longer control than shallow flat-bottomed wetlands.
4. Although temporary establishment of ruderal non-*Ludwigia* species followed control in some instances, active restoration is likely required.
5. True control may require manipulation of water levels or other changes to physical structure of invaded system.
6. When contemplating restoration of large *Ludwigia* invasion sites, small pilot projects are recommended to determine whether effective control can be achieved as planned and whether desired goals can be achieved.

A full report is available at [www.lagunafoundation.org](http://www.lagunafoundation.org)