

Catalpa speciosa control using herbicide application methods

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Introduction

There are two species of *Catalpa* found in California, *Catalpa speciosa* (northern *Catalpa*) and *Catalpa bignonioides* (southern *Catalpa*). Both are mainly used as large ornamental shade trees that are planted in urban areas as a street and lawn tree. *Catalpa* can become invasive in riparian areas as the seeds escape through storm drains and can be carried into stream or river beds. The southern *Catalpa* is native to the southeast U.S. The northern *Catalpa* is native to the southeast and midwest U.S.

Catalpa bignonioides has been reported to be present in the Sacramento/San Joaquin Valley riparian corridors (Cal IPC Inventory, 2006). In the northern Sacramento River, observers have noticed an increase in the number of *Catalpa* trees over the past decade. Specifically, in the Butte County area, observers have found *Catalpa speciosa*.

Control methods have not had a formal study, but some literature does exist. The chemical controls are “likely based on results of observations of related species” (UC Weed Research Center, 2013).

Methods

The formal herbicide treatment trial of *Catalpa speciosa* was carried out in two locations in Butte County in California.

- Bidwell-Sacramento River State Park on the riparian corridor of the mouth of Big Chico Creek at the Sacramento River.
- Lower and Middle Bidwell Park in Chico along the Big Chico Creek riparian corridor.

We chose 3 sizes of trees (<2”, 2-10”, >10”) and a total of 6 to 8 trees per treatment. All 3 size categories were included in each treatment. The treatments were conducted in a simple random sampling pattern, free from deliberate choice and independent of the selection of the sample points.

The four treatments and control are as follows:

- 1: 50% Aquamaster (aquatic glyphosate), hack and squirt, 1ml/3 inch circumference
- 2: 9% Stalker (imazapyr), basal bark application
- 3: 25% Element-4 (triclopyr), basal bark application
- 4: 60% Polaris (aquatic imazapyr), hack and squirt, 1ml/3 inch circumference
- 5: Control, no treatment

The treatment methods are as follows:

Hack and Squirt: A wound is made in the bark with a hatchet in a downwards slit so that the cambium is accessible for the herbicide. The herbicide is then applied into the wound directly into the tree’s cambium. The tree then physiologically distributes the herbicide through its canopy and roots.

Basal Bark: The herbicide is used in a diluted solution in oil. It is sprayed on the lower base (6-12 inches) of the trunk of the tree.

Total number of trees: 240 (120 trees at each site)

Exclusions from study:

- Create no hazard trees
- Create no maintenance cost, i.e. no downed trees on trails
- Maintain any current shade on Big Chico Creek, i.e. no treating trees that provide shade on BCC

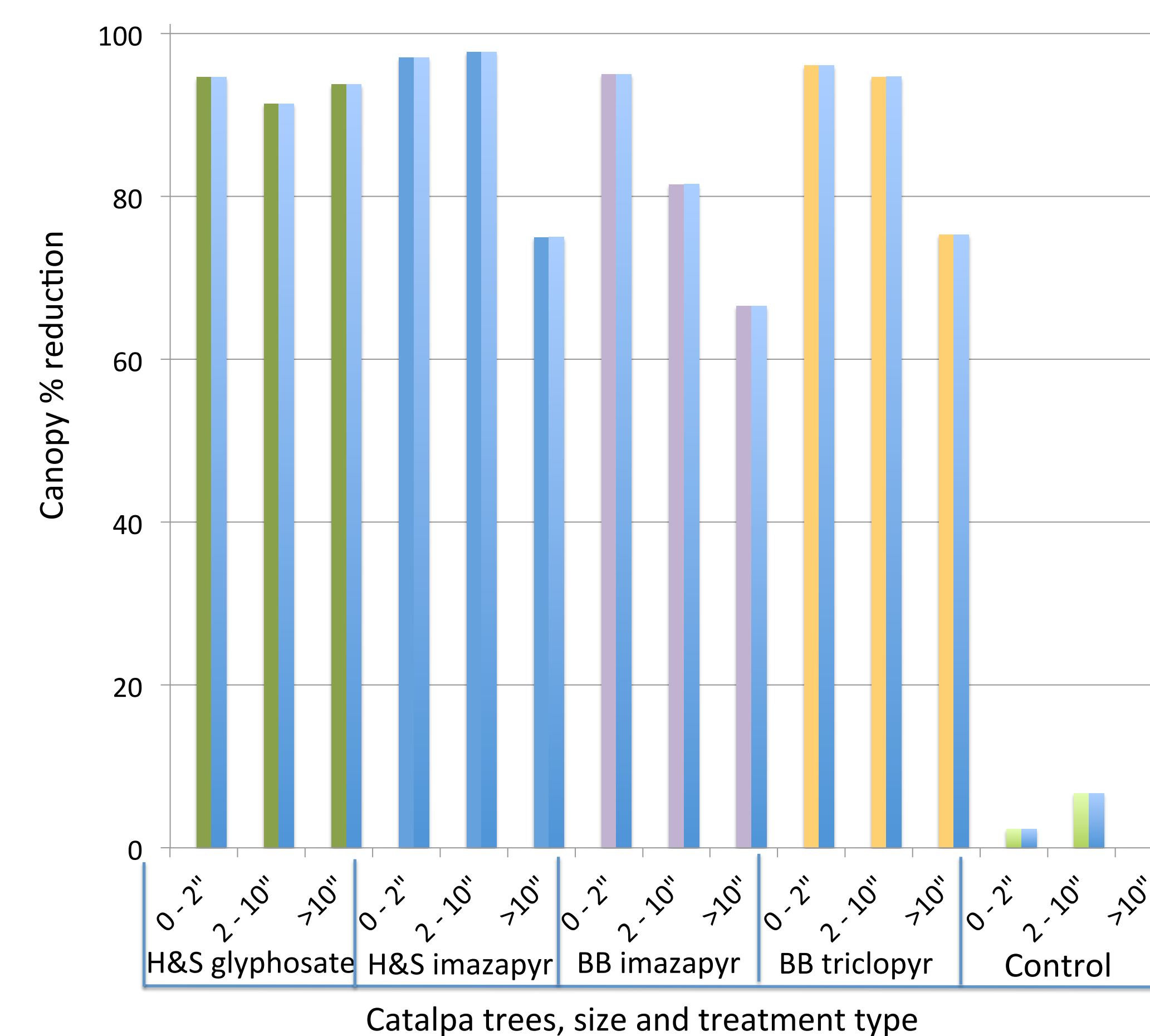
Objective

Determine efficacy of four mitigation measures of *Catalpa* trees along the riparian corridors in the central valley of California.

Results

8 months after treatment, we conducted visual evaluations of canopy reduction. The following table shows the mean canopy reduction of each treatment, including the control.

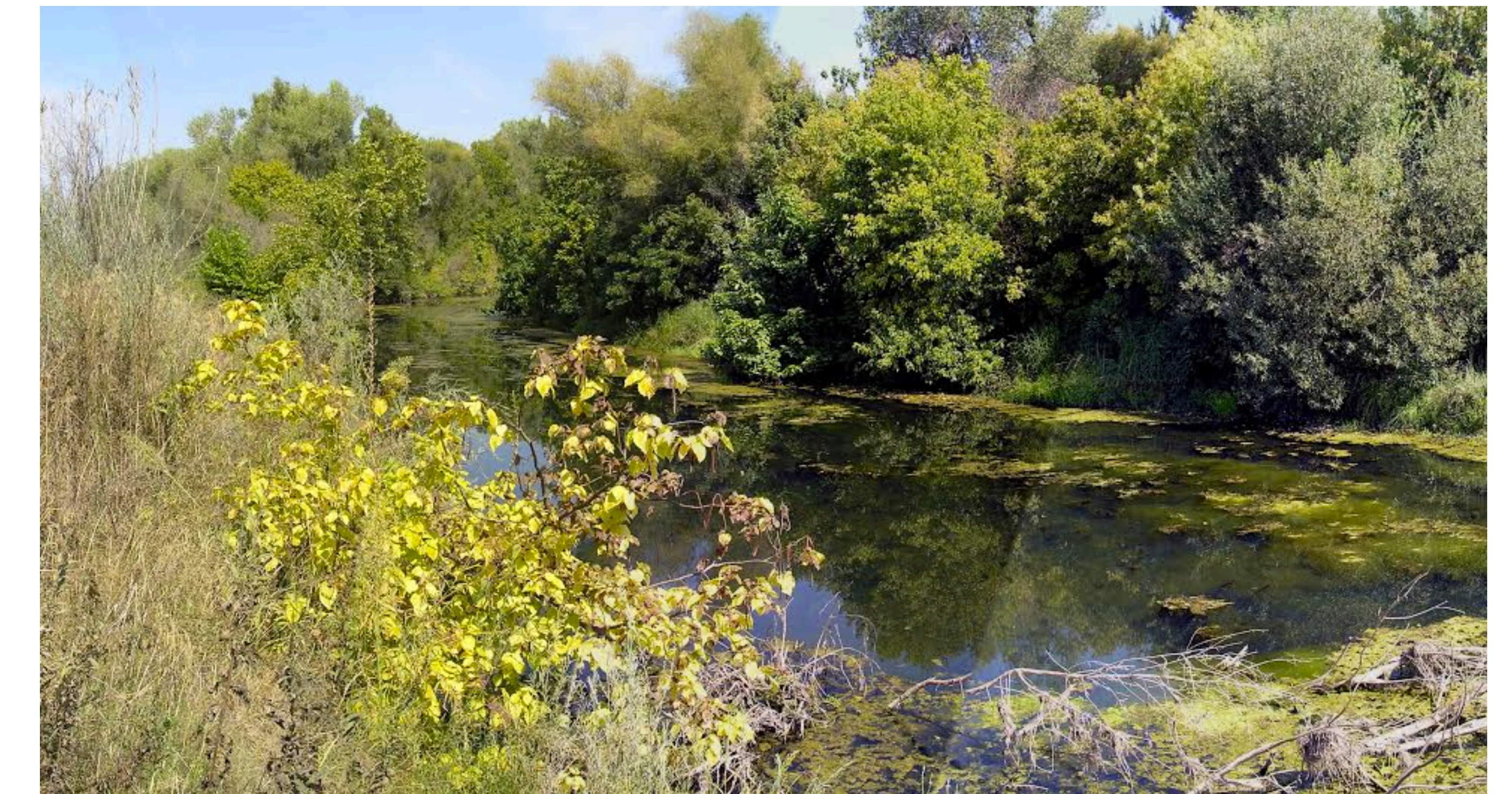
Catalpa Canopy Reduction



	Tree size	Canopy % reduced	Overall mean vigor ¹
Hack and squirt	0 - 2"	94.65	0.6
	2 - 10"	91.4	1.2
	>10"	93.75	0.8
Hack and squirt	0 - 2"	97.05	0.3
	2 - 10"	97.75	0.2
	>10"	75	2.8
Basal bark	0 - 2"	95	0.5
	2 - 10"	81.5	2.4
	>10"	66.55	5.2
Basal bark	0 - 2"	96.1	0.4
	2 - 10"	94.7	0.5
	>10"	78.3	2.8
CONTROL	0 - 2"	2.3	9.8
	2 - 10"	6.7	9.1
	>10"	0	10

¹Vigor is a visual evaluation scale where 0 appears dead and 10 appears healthy and alive

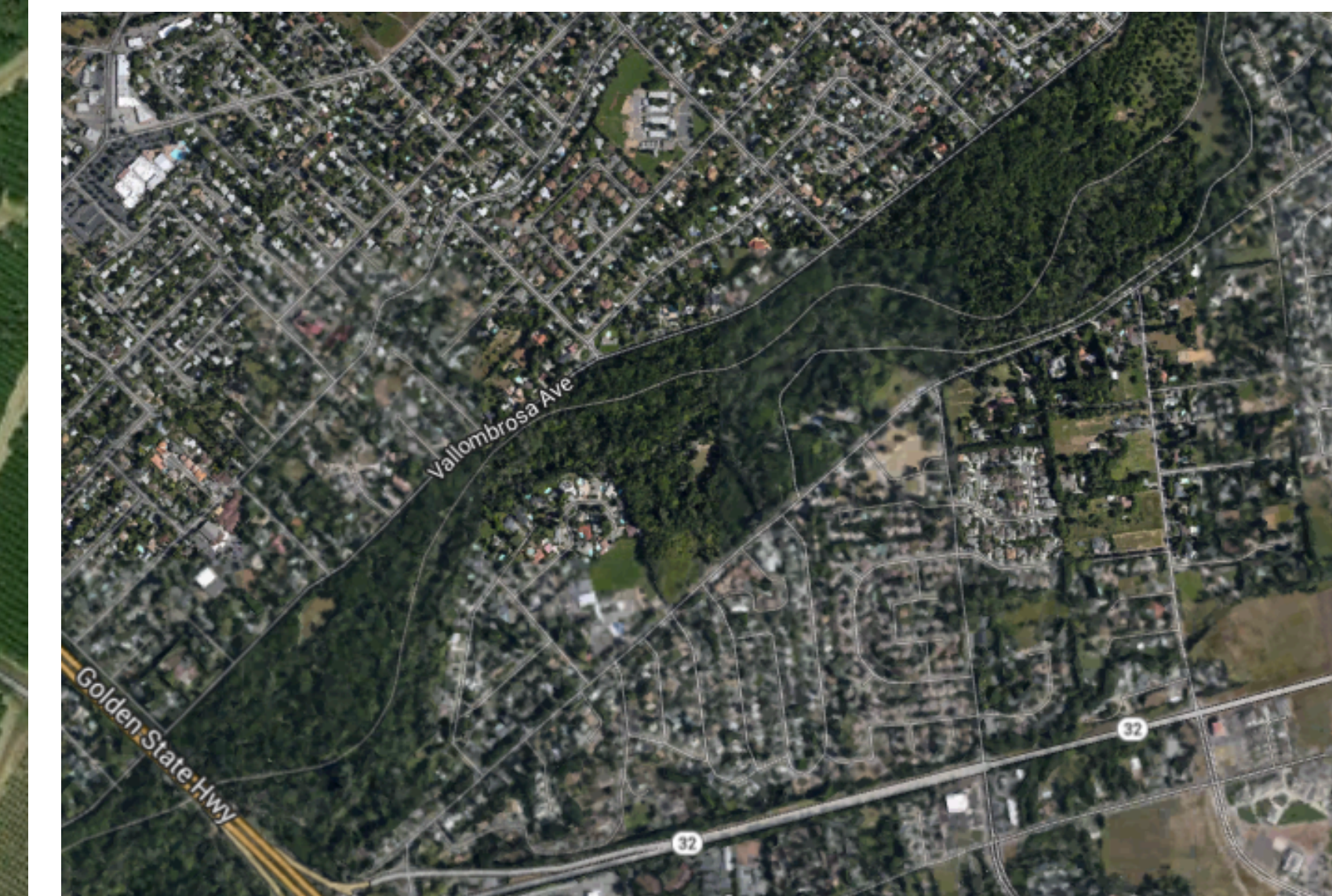
Photos



View of *Catalpa* tree on Big Chico Creek near where it meets the Sacramento River. Photo courtesy: Jim Dempsey



Aerial view of the treatment site at Bidwell-Sacramento River State Park.



Aerial view of the treatment site at Lower Bidwell Park.

Discussion

Both hack and squirt applications and the triclopyr basal bark application produced the most excellent control (greater than 90% canopy reduction). From our results, it appears that the trees with DBH greater than 10 inches do not react as well to the herbicide, as the trees of this size had a less reduced canopy. The trees of this size had herbicide damage, but without repeated treatment, the trees will likely grow back to their full canopy.

The basal bark application of imazapyr failed to have a significant reduction to be considered a good control method.

Some of the control trees that were close to the treated trees had slight herbicide damage. The trees were not damaged enough to affect the statistical significance of the control.

Timing of application could have an affect on the outcome of the various methods, but we were not able to test that at this time. It would likely be worth testing the various treatments at another time of the year other than fall.