

# **Truckee River Aquatic Invasive Plant Survey Results**

Submitted by U.C. Davis, Tahoe Environmental Research Center

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## **Introduction**

The spread of aquatic invasive species throughout the Tahoe Basin and the Truckee River watershed has been well documented (Anderson & Spencer 1996, Shaw et al. 2016, Wittmann et al. 2015). Recent efforts by the Tahoe Resource Conservation District (TRCD) have focused on removing Eurasian water milfoil (*myriophyllum spicatum*) from the Truckee River immediately below the outlet of Lake Tahoe for a distance of about 3 miles. UC Davis researchers are contracted to survey the annually scheduled treatment areas before and after implementation to assess treatment effectiveness and identify locations in need of followup treatment. The following survey results reflect post treatment surveys from the outlet of Lake Tahoe to the old dam site (0.68Km) below the existing dam. UC Davis researchers were not able to conduct pre-treatment surveys in this region as contract negotiations had not been completed prior to treatment deadlines. Additionally, pre-treatment surveys were conducted from the old dam site to the pedestrian bridge. This reach of the river is expected to be treated this summer.

## **Survey Results for Areas of the Truckee River Previously Treated for AIP**

### **Methods**

On July 18-19, 2016, areas of the Truckee River previously treated for aquatic invasive plants (AIP) using permeable bottom barriers and hand pulling were surveyed. The survey team covered 100% of the area treated the previous summer using walking/snorkeling techniques. This method was used to ensure that any AIP regeneration in the previously treated area was found, identified and mapped for re-treatment. For the 100% coverage surveys, UCD researchers formed a line and walked perpendicular across the riverbed spaced approximately 10 feet apart from each other in order to ensure overlap between each observer.

Transects were repeated across river until the entire stretch was effectively covered. When an AIP was found, GPS coordinates were collected to aid in creation of a map for recommended re-treatment locations. If a single stem AIP was found in an area with no others around it, the plant and its root system was hand pulled by UCD staff. GPS were taken so the area can be surveyed again to ensure removal was successful.

### **Truckee River Outlet to Tahoe City Dam**

The stretch of river from Lake Tahoe to the buoy line just before the dam was relatively free of AIP. Only one milfoil plant was found above the buoy line (N 39° 10.0473, W 120° 08.6071). It was removed by hand pulling. Below the buoy line, multiple milfoil plants are present (Figure 1). The area is relatively small and the milfoil is observed to be present in low densities. Hand pulling should be an effective treatment for this patch.

### **Tahoe City Dam to the Highway 89 Bridge**

The pool just below the Tahoe City Dam was relatively free of AIP. Two small plants were observed on the east side of the pool and were removed (Figure 1). UCD staff attempted to remove the entire root system of the plant but due to the rocky substrate of the area it is doubtful all was removed. This area should be re-examined in the future to ensure the milfoil does not return. The west side of the pool was observed to have low densities of milfoil between locks 1 – 7 just below the cement blocks. This area is deep (~6–8 feet) so divers will be needed to do the removal. Given the low densities observed here, hand pulling will be an effective treatment method.

### **Highway 89 Bridge to the old Tahoe City Dam site**

This stretch of river was treated last year using permeable barriers. There appears to be a significant reduction in milfoil density compared to untreated areas just downstream. From the Highway 89 bridge downstream to the start of the riffles, moderate milfoil density was observed (Figure 2). A combination of hand pulling and barrier application will be needed to effectively treat this area. Also present in this section of river, just below the bridge, are beds of chara or skunkweed (*chara spp.*) a native aquatic plant of the Lake Tahoe Basin (Figure 3). The chara is intermixed with milfoil in this area.

The presence of milfoil from the riffles down to the old dam is sporadic (Figure 2). Occasional plants are observed but densities are low so hand pulling in this area will work as an effective treatment.

## **Survey Results for Area Untreated for AIP**

### **Methods**

The area between the old dam site and the pedestrian bridge, located 190 meters downstream, was surveyed to establish baseline pre-treatment conditions. Four transects using point intercept survey methods were conducted across the stream channel. Transect locations were established using GPS coordinates and physical shoreline markers (i.e. trees, boulders, road signs, etc.) to ensure sites can be resurveyed following AIP removal treatment. UCD researchers recorded observations of aquatic plant presence/absence, species type and sediment composition every 3 feet along the transect. A 100% coverage walking survey was also conducted in order to determine recommended treatment method.

### **Old Tahoe City Dam site to Pedestrian Bridge**

Results from the 100% coverage walking surveys showed large patches of dense milfoil growth primarily along the west bank and generally extending to the middle of the river. The east side of the river had low to moderate densities of milfoil present primarily in depths greater than 20 inches although some milfoil plants were observed shallower. It is recommended that barriers be used to cover this entire section of river bottom in order to get the most effective coverage. If material, time or budget restraints do not allow for enough barriers to cover this entire area, approximately 1.05 acres, then it is recommended prioritizing the use of bottom barriers on the denser milfoil patches along the west river bank and hand pulling the less dense milfoil patches on the east side.

### **Transect Survey Results**

The point intercept survey transects reflected the general findings from the 100% walking survey with the majority of AIP occurring along the west half of the river channel. However, these more detailed transect results included substrate characterization and will be used to determine AIP treatment effectiveness (% removal) and substrate changes when they are repeated next summer. It is anticipated that the removal of AIP from the river will result in increased cobble and gravel substrate over time as the

rooted plants tend to trap fine sediment. The table below summarizes results from the pre-treatment point intercept surveys transects:

Transect #	AIP Presence		Substrate Composition			
	Percent AIP	Species	Silt	Gravel	Cobble	Boulder
1	58%	Milfoil	34%	49%	17%	0%
2	43%	Milfoil	37%	37%	22%	2%
3	50%	Milfoil	48%	39%	13%	0%
4	45%	Milfoil	92%	4%	4%	0%

### Truckee River AIP Survey Results: Truckee Outlet to Highway 89 Bridge

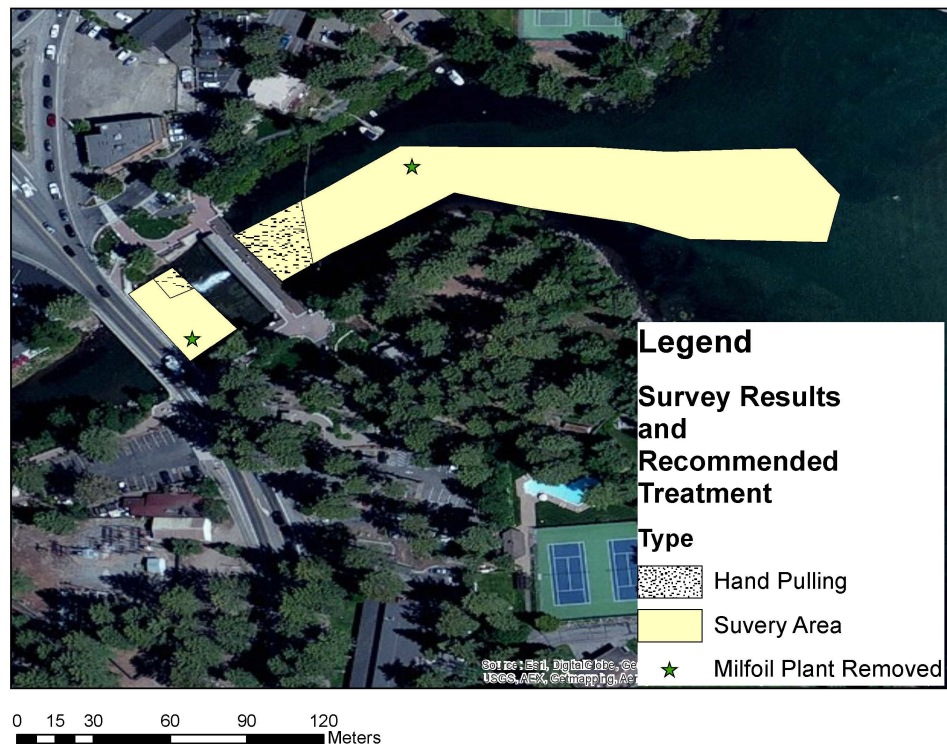


Figure 1: Results from the 100% coverage survey of the Truckee River from the outlet to the Highway 89 bridge. The majority of the river was free of AIP but some milfoil was found in small patches. Hand pulling is the recommended treatment for these patches.

## Truckee River AIP Survey Results: Highway 89 Bridge to Foot Bridge

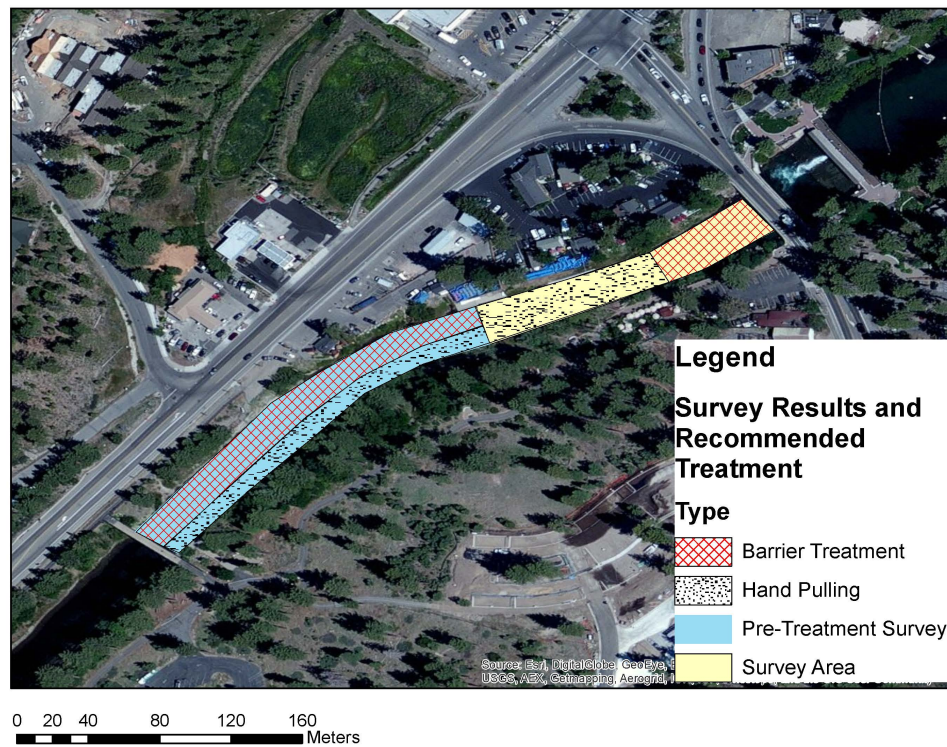


Figure 2: Results from the 100% coverage walking survey from the Highway 89 bridge to the pedestrian bridge. A combination of barrier application and hand pulling will be needed to effectively treat this area.





Figure 3: Chara, a native aquatic plant to the Tahoe Basin, can be seen on the left. Milfoil, an AIP, is seen on the right. Small beds of chara were found intermixed with milfoil near the Highway 89 bridge.

## Truckee River AIP Pre-Treatment Survey Transects

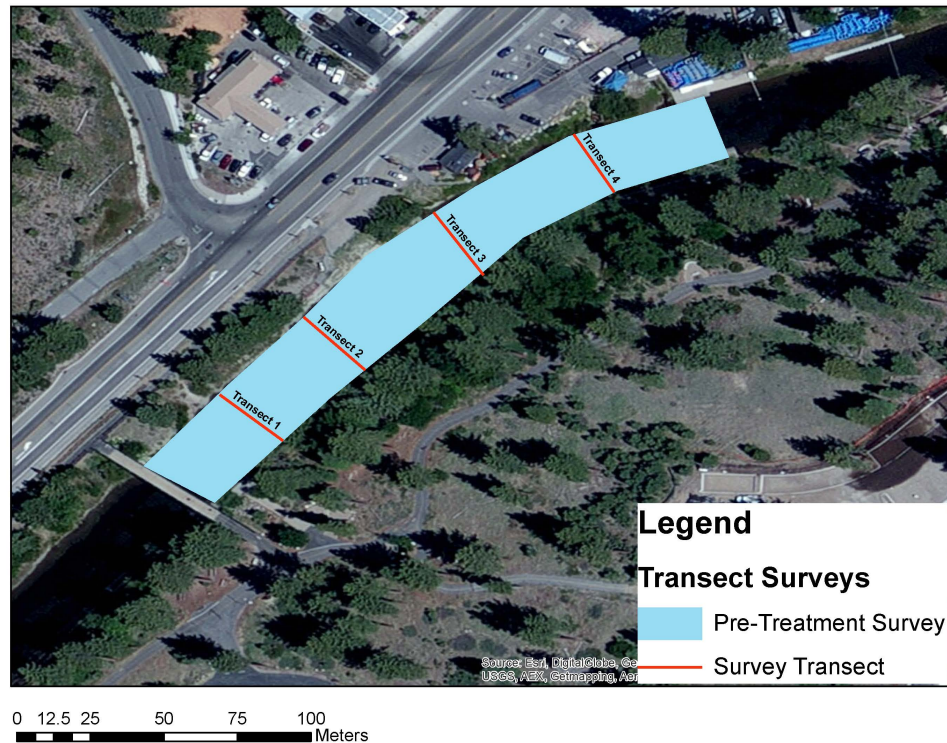


Figure 4: Location of point intercept transects which were conducted to establish pre-treatment conditions for area of the Truckee River to be treated for AIP in summer 2016.

## Works Cited

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