Western Pearlshell Mussel (*Margaritifera falcata*)
Upper Truckee River Forest Service Relocation Efforts To Date July 2016

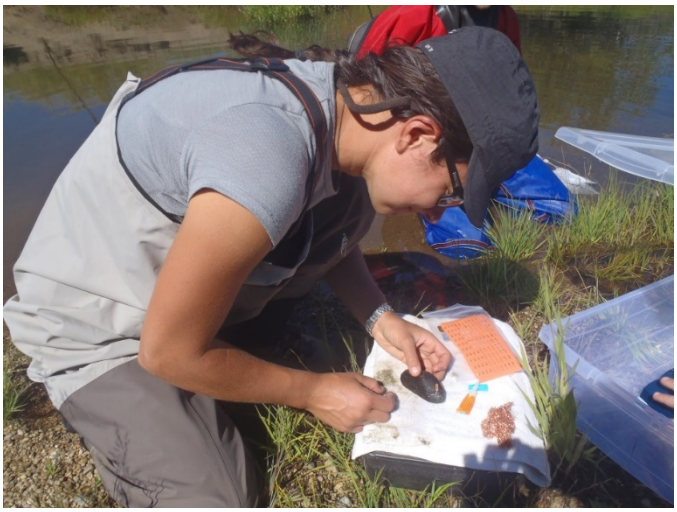
Background

Reach 5 of the Upper Truckee River (UTR) Restoration Project is dewatering and filling in a 7,400 ft where the native mussel *M. falcata lives*. The environmental analysis included design features and mitigation measures to protect and benefit wildlife species. One design feature is to remove mussels from the active river segment prior to diverting channel flow.

Relocation of mussels has been a large scale effort involving multiple steps, phases, and partners. In 2014, the Forest Service worked with partners and mussel experts to develop a pilot study designed to identify relocation methods and site habitat characteristics to successfully support the translocation of approximately 20,000 mussels.

In 2015, 8,544 mussels were relocated from a future diversion area. In 2016, 5622 mussels were relocated from additional sweeps of the 2015 diversion area. The remaining work in 2016 will be to complete relocation of the remaining mussels.

Monitoring of the pilot study and the larger relocation will continue through 2017 and into the future as funding allows.



Pilot Study

Assess the success of mussel relocation through investigation of the following questions: 1) Is survival influenced by relocating individuals to sites with existing mussel beds? 2) What stream/habitat characteristics influence survival of relocated mussels? 3) Does mussel size influence success, defined as survivorship and persistence? 4) Do actions associated with relocation (e.g. marking and measuring) influence relocation success?

In 2014, 925 mussels were tagged, weighed, measured, and relocated into 37 plots in 8 reaches in the Upper Truckee River, Trout Creek, and Truckee River. Data was collected on 13 habitat variables at each plot. Monitoring occurred during the spring and fall of 2015 and will continue in the fall of 2016 and 2017.

654 mussels (71%) were relocated in fall of 2015. Only 2 mussels (0.22%) have been confirmed dead. Success based on presence and length was not significantly different between reaches. Median weight differed between reaches (Figure 1 and 2).

Preliminary data suggest that lower cover of aquatic vegetation, lower elevation, and lower minimum and maximum water depth were important for increased weight. These variables could indicate that mussels gain more weight in areas with higher velocity that are not pools.

Initial size was not correlated with survivorship and growth.

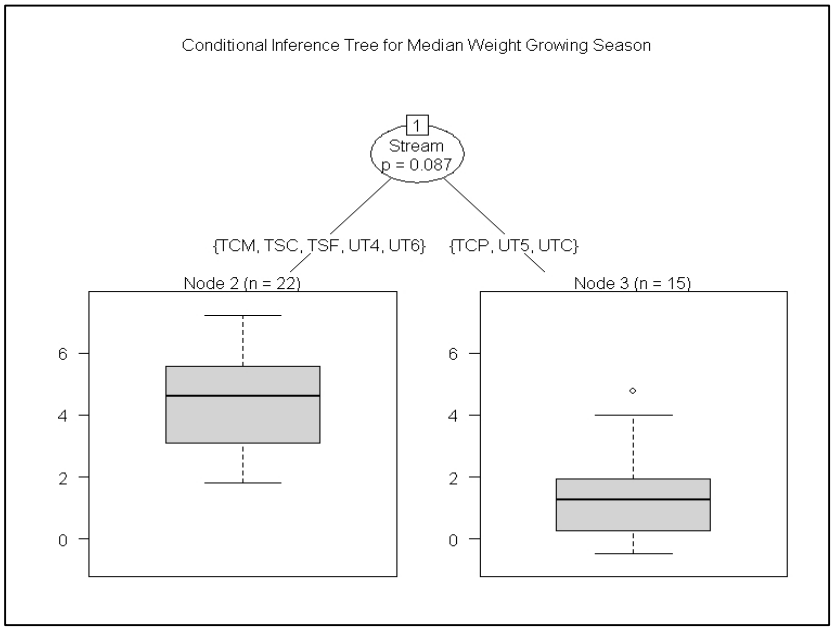


Figure 1: Regression tree based on median weight. Reaches identified on the left had significantly greater weight gain one year after relocation compared to reaches on the right.

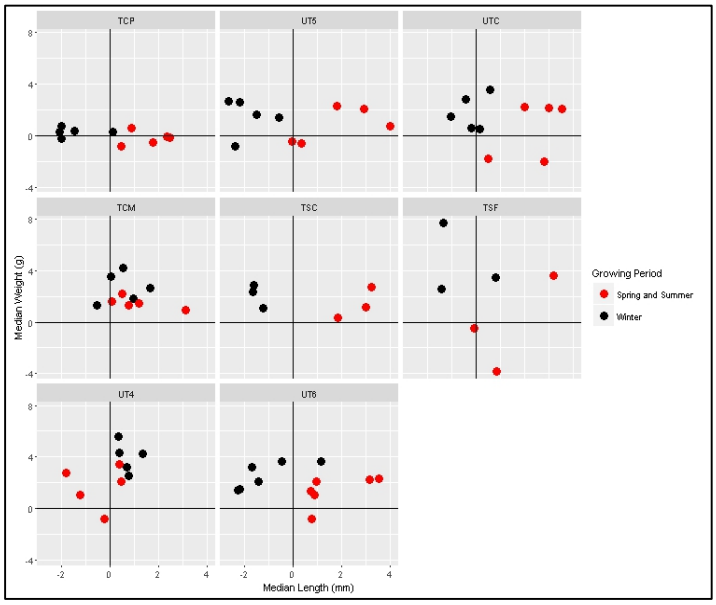


Figure 2: One year median growth rate. Length - X axis and Weight - Y axis. Each box is a different reach. Red circles represent growth from fall 2014 to spring 2015 and black circles represent growth from spring 2015 to fall 2015.

Relocation Efforts

15,101 (925 from study and 14,176 from larger effort) mussels have been moved to date (Table 1).

Table 1: Number of mussels moved in 2015 and 2016 to different relocation sites.

Site	2015	2016	Total
Cold Creek Downstream	828	0	828
Cold Creek Upstream	162	0	162
Trout Creek Martin	1460	0	1460
Trout Creek Pioneer	0	1491	1491
Trout Creek Saxon	0	1444	1444
Trout Creek Powerline	0	2687	2687
Truckee River Granite Flat	740	0	740
Truckee River SF Fly Fishing Club	640	0	640
Upper Truckee River Reach 3	1427	0	1427
Upper Truckee River Reach 4	1098	0	1098
Upper Truckee River Reach 6	2199	0	2199
Grand Total	**8554**	**5622**	**14176**