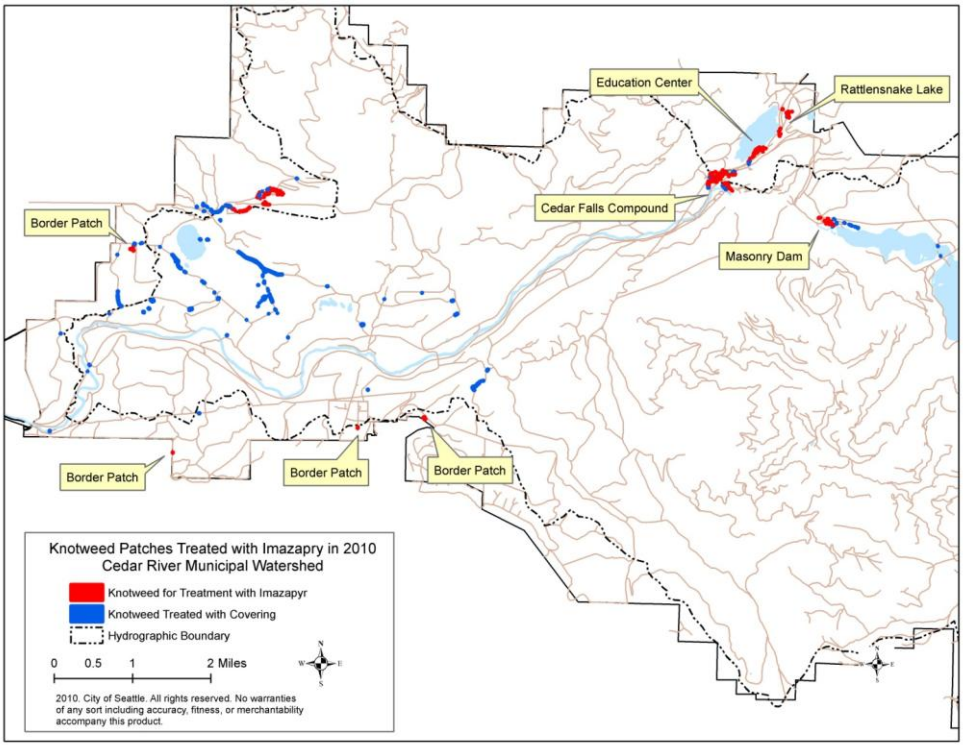
Knotweed 2010 Treatment Summary, Cedar River Municipal Watershed

The first of three years of planned treatment of knotweed with Imazapyr in the Cedar River Municipal Watershed was completed during August and September of 2010. An Operational Plan and Safety Plan were both completed prior to treatment and successfully implemented. There were no spills, and no injuries or adverse effects were incurred by SPU staff or the four contract crew members from Restoration Logistics conducting the herbicide application. Trails adjacent to the knotweed patches were closed to the public during the application. Permanent interpretive signs were placed at strategic locations near the Education Center patches to inform the public about the project and temporary signs were placed adjacent to all sprayed patches.

Despite the unusually rainy weather last year, we had sufficient dry, calm days when the crew was on site to complete the foliar spray application in all areas planned for treatment. A total of 7.7 acres of knotweed was treated in 2010, including all patches in the Cedar Falls compound, near the Masonry Dam, the Education Center, and Rattlesnake Lake, as well as the isolated western and southern border patches (see Map 1). All patches, with the exception of a few of the border and Rattlesnake Lake patches, were also pre-treated by bending canes. This pre-treatment worked very well, allowing crew access through the dense canes and ensuring the crew could safely spray all portions of the plants.

Map 1. Knotweed patches treated in 2010 at Cedar Falls, Masonry Dam, Rattlesnake Lake, the Education Center, and southern and western border patches.



Most of the patches had significantly increased in size since they were measured in 2008. The patches inside the hydrographic boundary (near Masonry Dam and some patches in the Cedar Falls compound) totaled 1.8 acres, a 0.6 acre increase. Patches outside the hydrographic boundary at Cedar Falls, the Education Center, Rattlesnake Lake, and the boundary totaled 5.9 acres, a 1.5 acre increase.

The Imazapyr (Habitat®) label recommends using a volume of 37 to 49 gallons of 1% solution per acre to treat knotweed. We averaged 35 gallons of 1% solution per acre and were able to cover 70 to 100 percent of each knotweed plant with this amount. This was expected to maximize knotweed mortality while remaining far under the maximum legally allowable limit of six pints of Imazapyr or 74 gallons of 1% solution per acre.

The knotweed leaves absorbed the solution very quickly (within minutes). The blue dye added to the clear liquid solution allowed us to not only see what portions of the plant had been sprayed, but also to visually determine that the solution was rapidly being transported into the plant tissue through the leaf veins. The backpack spray method proved very effective at focusing the spray on the knotweed foliage and produced little or no overspray or drift onto adjacent plants. As expected, the knotweed plants showed no immediate effects from the spray. No animal mortality resulting from the herbicide application was seen in any of the knotweed patches.

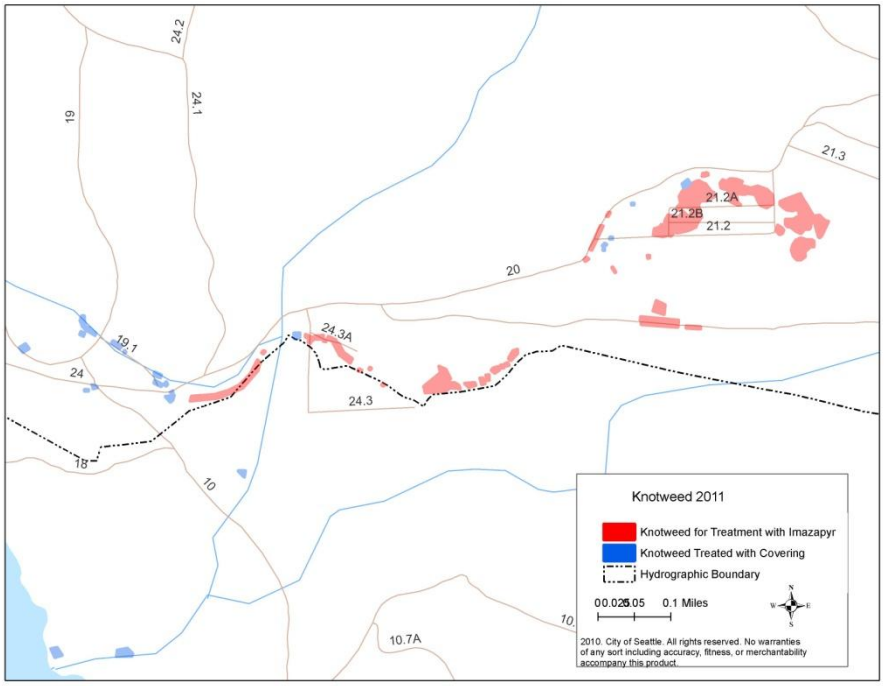
Water quality samples were taken both before and after the 2010 herbicide application. For patches within the hydrographic boundary, baseline samples were taken prior to treatment in both the Cedar River at the point nearest a treated patch (250 feet away) and at the Landsburg water supply intake facility. Post-treatment samples were taken at these same sample locations early the morning following treatment (approximately 16 -20 hours post-treatment). Water samples were taken from Rattlesnake Lake prior to treatment of patches at the Education Center and Rattlesnake Lake, and on the two mornings following treatment of these patches. No Imazapyr was detected in any of the samples at a detection limit of 0.02 ug/L (parts per billion).

Timeline of Knotweed Treatment, 2010, Cedar River Municipal Watershed	
July 24-29	Knotweed canes bent in patches at Masonry Dam, Cedar Falls, Rattlesnake Lake, and Education Center.
Aug 24-25	Start treating border patches. Start treating patches at Cedar Falls outside hydrographic boundary.
Aug 30	Baseline water samples at Landsburg and Cedar River near Cedar Falls. Treat all patches within hydrographic boundary (Masonry Dam, Cedar Falls).
Aug 31	Post-treatment water samples at Landsburg and Cedar River near Cedar Falls.
Sept 2	Treat Cedar Falls patches outside hydrographic boundary.
Sept 13	Baseline water sample at Rattlesnake Lake. Treat patches at Education Center and Rattlesnake Lake.
Sept 14	Post-treatment water sample #1, Rattlesnake Lake. Treat remaining patches at Rattlesnake Lake, remaining border patches (bent canes in largest 1.3 acre patch just prior to treatment).
Sept 15	Post-treatment water sample #2, Rattlesnake Lake.

The 2010 treatment was highly successful. In the spring of 2011, there was approximately 90% mortality (as measured by biomass) in the treated patches. As expected, there are small isolated live canes scattered throughout the treated patches, which will require additional treatment. In addition patches totaling approximately 0.1 acre at Cedar Falls, the Education Center, and Rattlesnake Lake were missed in 2010 and will need to be treated for the first time. The 2011 treatment will use the

same protocol as used in 2010, i.e., targeted backpack foliar spray with a 1% imazapyr solution. Water quality sampling identical to that completed in 2010 (see above) will be conducted in 2011. In 2011, in addition to treating these small scattered canes and missed areas in the patches treated in 2010, the large patches in and near the old Taylor Townsite (approximately 6 acres outside the hydrographic boundary – see Map 2) will be treated for the first time, using the same protocol described above (targeted backpack spray). All patches were pre-treated with cane bending in early to mid June 2011. They will be sprayed in late July or early August, to avoid potential conflicts associated with a wet September and because of the extraordinary re-growth that occurred in the four weeks after bending, likely due to the unusually cool wet weather. Early treatment is required before the canes grow too high for the contractors to reach.

Map 2. Knotweed patches in and near the old Taylor town site, to be treated for the first time in 2011.



There is one small stream that runs along one small portion of the Taylor patch. Water quality samples will be collected in this stream both before and after spraying, identical to that conducted at Rattlesnake Lake in 2010.

All knotweed patches in the municipal watershed are monitored at least once per year to document response to treatment. This monitoring will continue annually for a minimum of five years after complete mortality is achieved. After that, it will be on-going but on a less frequent basis. In addition, we conduct periodic surveys of all high risk areas to find any new patches that might occur. This includes all areas downstream of any known patches. If new patches are small, they will be treated immediately by covering with geotextile fabric. If we happen to find any large previously undiscovered patches through 2012, under the ordinance we can treat them using the same protocol as described above (targeted backpack spray with 1% imazapyr solution).

Plans for 2012 are to re-treat all patches treated for the first time in 2011, including the old Taylor town site patches and the ones missed in 2010 at Cedar Falls, the Education Center and Rattlesnake Lake.