



The Salmon Creek Watershed has experienced gradual water quality degradation from land use practices and urbanization and has not been meeting state water quality standards for a Class A waterbody. The major water quality impairments are temperature, fecal coliform and turbidity. To address these impairments this project enhanced and protected streambanks using riparian plantings, livestock fencing, floodplain connectivity improvements and invasive non-native plant removal.

**OUTCOME:**

All performance measures on this grant were met or exceeded. The primary tasks for this project included riparian plantings, livestock fencing, floodplain connectivity and invasive non-native removal.

A total of 55,385 plants (40,000 plants per grant) were installed over 74 acres (40 acres per grant); exceeding grant performance measures by 38% and 85% respectively. Plants were installed using a variety of crews including correction crews, contract crews, AmeriCorps, part-time students and staff. Plant survival ranged from 64% to 94% average about 85%. The lower survival numbers were seen on small projects where watering was not feasible. The bulk of the projects were 80% and higher. Areas with survival less than 85% were replanted. Projects where plants were actively maintained (i.e. watering, mowing, etc.) did significantly better.

Livestock exclusion fencing was installed on projects where landowners had or planned to have livestock. Since the County is rapidly urbanizing many recruited landowners had either discontinued or never had livestock. For the projects we didn't fence we have periodically reviewed to ensure that livestock are not currently on premises. We did meet the grant performance measure of 10,000 feet. We also installed a livestock crossing (not reimbursed by grant).

All projects worked on had significant numbers of invasive non-native species present. The primary and most abundant was Reed canary grass. Blackberries (Himalayan & Evergreen) were prevalent on almost every project. Other non-native species controlled or eradicated included English ivy, Thistle, Tansy, Poison hemlock, Japanese Knotweed and Bitter nightshade. We estimate that approximately 93% of our projects were dominated by invasive non-native plants.

A total of 2500 feet of channelized and diked stream were re-connected to the floodplain using LWD and excavation & removal of soil. Approximately 5,000 cubic yards were removed. The diked system had 1:1 slopes and was caving into the stream during every flood event. The banks and the stream bed were choked with Reed canary grass. The bottom of the stream channel was heavily silted in with no cobble present. Once the new floodplain was excavated a new stream channel was excavated in numerous areas to initiate a meandering pattern. Coir and Jute fabrics were installed on newly excavated soils to prevent sedimentation. The project area has withstood several 50 year flood events with no failures to date. Rearing juvenile salmon have been observed

using the LWD. The stream channel is no longer choked with Reed canary grass and the willows are already beginning to overhang into the channel.

Project maintenance was an important component of our grant expenditures and proved to be the most important. We maintained all project areas for at least three years with many projects now in their fourth year. Many of the projects we will need to maintain for an additional two years to assure that our main objective was met.

Our educational outreach measures were modest. We attended and staffed informational booths at several large scale events including the Clark County Home and Garden Fair for three years. Other venues included Earth Day events (usually 3-4 per year), and our tree planting events. We did produce a brochure but did not submit for reimbursement.

## **EVALUATION:**

In order to improve stream temperatures and decrease turbidity our primary objective is to create self-sustaining native plant communities. We are meeting that objective but will need to continue maintenance activities for awhile longer if we are to attain it in the long term (20 year time frame). We continue to work on invasive non-native species.

Our approach for managing and reducing Reed canary grass has been very successful. We adopted the NW Chapter of the Society for Ecological Restoration's working group recommendations for Reed canary grass. The primary approach is to starve it to death and then provide heavy shade. The process includes mowing, chemical application and then followed by another mowing. This process, if employed correctly the season, before planting shows great promise. Plantings where this has been thoroughly applied do significantly better. On some of our older grant projects where the canopy has begun to close native forbs such as Carex, rush and Scirpus have begun to re-establish voluntarily. We found that where Cedar or other year round shading providing species were used that Reed canary grass dominance was curtailed significantly.

With regard to riparian plantings we are finding that our biggest threat is that of beavers. Beavers have always played a part in plant mortality but we have seen a significant increase in predation since the trapping initiative was passed four or five years ago. The number of beavers has grown exponentially and they are removing plants as fast as we can plant them. Though beavers have evolved and been a part of providing excellent riparian habitat the normal coppicing and regeneration process has been truncated by Reed canary grass. Normally established trees will tolerate and sometimes thrive with beaver predation. What I have observed (as well as others) now is that once trees /shrubs are coppiced by beaver they will rebound once. The next time they are coppiced the plant is stressed and is out competed by Reed canary grass. We have tried many methods of protecting trees none of which is a long term. We had one planting that was not checked for two months and found over 400 trees had been taken

by beaver. We replanted and they returned the following year and took another 400+ trees.

**FOLLOW-UP:**

In order to assure canopy closure and long term attainment of our objectives we will continue to maintain non-natives and re-plant where necessary over the next three to four years. We have set aside funds to do so.



**Photo June '07 - Planted 2004-05**



**Photo June '07 - Planted '03**



**Photo June '07 - Planted '05**



**Photo May 2007 ~ Planted 2005**



**Photo '07 - Planted '03**



**Photo '07 - Planted '04**



**Photo '07 - Planted '04**

**Salmon Creek Riparian Restoration**

**Clark Public Utilities**  
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