Restoration Stewardship Project

Final Report

2004-2005

Restoration Stewardship

University of Oregon – Environmental Studies

Service Learning Program

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Executive Summary

2004-2005 was the implementation year of a multi-year cooperative effort between restoration organizations and the University of Oregon. The project is funded through 2006 by the Williams Foundation and will pursue continued funding through other partners, as well. Partners include three local watershed councils: the Long Tom Watershed Council, the McKenzie (including the Mohawk) Watershed Council, and the Middle Fork Willamette Watershed Council. Other partners include Lane County and Buford Park/Mt. Pisgah. Individual projects and landowners were identified through watershed councils for participation in the project.

Fall Quarter was devoted to learning software packages such as PowerPoint and Dreamweaver, and getting familiarized with monitoring methods. The Restoration Team presented project basics to the Service Learning Program (SLP) community at the end of Fall Quarter.

During Winter Quarter the Team began visiting sites, gaining a better understanding of the monitoring methods, and actual data collection. Two field trips were scheduled each week for plot set-up and data collection. Analysis began for individual sites once data collection was completed. Each Team member was assigned a participating landowner to interview for restoration perspective and background. The Team concluded the quarter with a second presentation to their SLP peers.

Early in Spring Quarter we focused on the class work and field trips for the Watershed Science and Policy Extension Class (360X). Four field trips were conducted with data collected, sites toured and maintenance completed. Three additional Field Assistants were included in field trips and trained in monitoring protocols. Mid-quarter we focused heavily on completing field data collection and analysis. The end of the quarter was devoted to data clean-up, analysis, organization, and presenting results to the Middle Fork Willamette and Long Tom watershed councils. The Team gave their final presentation to the SLP community and attending landowners/land managers in June 2005.

Introduction

The three primary goals of the Restoration Stewardship Project were to:

- Provide structured riparian planting monitoring for participating restoration groups,
- Expose a group of undergraduate students to the process of restoration monitoring, from start to finish, and
- Provide a graduate student with project management experience.

Background

The Service Learning Program and local watershed councils recognized the potential for combining field-based learning with the need for structured restoration monitoring. Combining monitoring with teaching potential at University of Oregon seemed a great opportunity for all parties. The Team is actively working with the Long Tom Watershed Council in Eugene, the McKenzie Watershed Council in Eugene, the Middle Fork Watershed Council in Lowell, and the Friends of Buford Park in Springfield. Mohawk projects are included in the McKenzie Watershed Council listings as projects are managed cooperatively. Stafford Bridge is a bridge replacement restoration site managed by Lane County, but also listed under the McKenzie Watershed Council. A total of 20 sites were identified initially for monitoring, but only 11 of those were completed in 2004-2005. Others will likely be added next year.

Effectiveness vs. Implementation Monitoring

Adaptive management relies on monitoring for recognizing what works well, and what doesn't, in order to change activities to get better results. Monitoring for restoration work comes in two primary forms: implementation and effectiveness. Implementation monitoring asks the question, "is our practice functioning as intended?", or in this case, "is the planted stock free-to-grow?" Effectiveness monitoring asks the question, "has our practice changed habitat function or quality, and if so, how much?" Measuring the amount of open sky above a streambed before tree planting and again after trees are established is an example of effectiveness monitoring. Measuring growth rates for various species can help predict how many years will be needed to achieve the desired

changes in habitat conditions. One method of tree planting and maintenance may provide stream canopy within 10 years while another would require 15 years. Free-to-grow status is the first and largest milestone in the life of a restoration-planting project. Once trees and shrubs are essentially free from competition, or well-rooted enough to hold their own without periodic release treatments, then stock is considered free to grow. At that point maintenance costs go down greatly, and baring catastrophic events or beaver damage, a planting can be left on its own with only periodic stand management or inter-planting. The Restoration Stewardship Project is designed to provide feedback on growth rates related to management and planting, up to the point of free-to-grow. Protocols exist for effectiveness monitoring for many different variables, and are listed in the Restoration Monitoring Plan (Appendix A).

The Restoration Monitoring Plan was modified from the Coastal Oregon Riparian Silviculture Guide, published by the Coos Watershed Association in 2003. Protocols were adjusted to better-fit Willamette Valley environments and planting plans. The Planting Monitoring Plan, in its entirety, is presented as Appendix A.

Tasks/Skills

Undergraduate students, through the course of the year's project were expected to accomplish the following tasks and/or skills with guidance from either the Program or Project Manger:

Plot set-up, including stratified sampling, capturing site variability and judgment calls.

- *Stratified sampling and capturing site variability*
- *Plot and site measurements*
- *GPS usage and data recording*
- *Exercising good judgment*
- *Interpreting/working with aerial photographs*

Interactions with landowners/land managers

- *Setting up secondary field visits*
- *Collecting history or site information as needed*
- *Reporting results*

Tree/shrub measurements

- *Identification of planted and competing species, with and without summer foliage*
- *Identification of many types and intensities of damage to planted stock*
- *Estimation of microsite variables such as canopy cover, and competition*
- *Understanding of geomorphic stream surfaces as they relate to planting stock*
- *Consistent, legible and thorough recording of field data*
- *Exercises in judgment calls on individual measurements and calibration with other team members*
- *Responsible for teaching monitoring protocols to fellow undergraduate students in both group and one-on-one formats*

Modification of analysis and monitoring protocol

- *Creation or adjustment of specific damage codes to accurately reflect conditions*
- *Increase protocol focus on shrubs*
- *Creation of plant identification tools and summaries for field use*

Data entry and analysis

- *Experience manipulating data and creating cross-tabulated summary tables*
- *Organization and storage of all site data and photos for easy accessibility*
- *Critical thinking in double-checking entered data and results for errors*

Summaries of results

- *Written presentation of characteristics and observations from data at each individual site*
- *Written summary of landowner interviews including history, impressions and advice*

Presentation of methods, project and results

- *PowerPoint presentation to peers regarding the project as a whole, as well as examples of specific data*
- *Presentation of results to participating partners, in 2005, one PowerPoint presentation to the Middle Fork Willamette Watershed Council and a second-field presentation-to the Long Tom Watershed council*
- *Website summary of project, including specific examples and general concepts*
- *Poster presentation of project, focusing on general concepts and limited examples*

The Schedule

The schedule for the Restoration Team (Table 1), including monitoring, analysis and reporting is presented below. The schedule is a visual representation of the Final Work Plan, listed in Appendix B.

Table 1. Restoration Stewardship Project Schedule.

Restoration Stewardship Project Schedule																								
Tasks	January				February				March					April				May				June		
	1-7	8-14	15-21	22-28	29-4	5-11	12-18	19-25	26-4	5-11	12-18	19-28	28-1	2-8	9-15	16-22	23-29	30-6	7-13	14-20	21-27	28-3	4-10	
Orientation and training	**Winter Quarter**												**Spring Quarter**											
1. Basic training																								
2. Tour select sites																								
3. Photo library, literature & training																								
Coord. with councils, landowners																								
4. Request planting info																								
5. Schedule field visits																								
6. Landowner interviews																								
7. Communicating results																								
8. Spring quarter field days																								
Collect planting data																								
9. Collect tree data																								
10. Set up plots and choose sites																								
11. Analyze data																								
12. Photo monitoring points																								
13. Identify maintenance needs																								
Education and outreach																								
14. Web site const. & maint.																								
15. Landowner Resource Guide																								
16. Riparian planting list serve																								
17. Present to councils																								
Reporting																								
18. Summarize data collected																								
19. First-year summary																								
20. Final presentation																								

Service Learning

Geography 360X

Learning-by-doing is a major goal for the Restoration Stewardship Team. In addition to the tasks outline above, the Team was also expected to help guide other students through a similar, though significantly shorter, field experience. As an extension to Watershed Science and Policy (Geography 360), students were offered a one-credit-hour field course (360X) to complement what was learned in the classroom. Students toured restoration sites with landowners, measured trees and shrubs for baseline data, and performed riparian planting maintenance tasks. Three short classroom sessions were held to introduce riparian restoration concepts, explain monitoring protocols, and explore analysis results from gathered data. Two weekends in April were schedules for field trips, a shorter trip on Friday afternoon and an all-day trip on Saturday. Grading was Pass/No Pass. Students were required to attend all three classroom sessions and allowed to choose either two Saturday trips or one Saturday trip and two Friday trips.

The format of the field trips was designed to allow students to learn first-hand from landowners how and why they chose the restoration projects for their property and what they had learned from the experience. Students were encouraged to ask questions and interact with each landowner and were expected to help with identified maintenance tasks on-site. A series of sites were chosen for variety in sizes, conditions and ecological goals. Table 2 provides details about what sites were visited, what was accomplished at each, and the types of restoration being attempted.

At each site, Restoration Team members were asked to give an overview and demonstration (as a group) of how monitoring protocols were applied, as well as primer on plant identification. The 360X students were then divided into smaller groups-each led by a Restoration Team member for addressing questions and quality control.

Landowners were asked to lead a tour of the site giving history of activities, restoration goals and what they had learned from the process. All participating landowners were very open and helpful, and glad to have us there. Maintenance typically happened toward the end of the field trip, under the direction of the landowner or manager. Staff from Friends of Buford Park led the field trip to Buford Park, as it is publicly owned.

Table 2. Summary of field sites visited with 360X students.

Property	**Size**	**Restoration Goal**	**Property/habitat type**	**Maintenance work performed**
Taylor's Place	1 acre	Natural stream movement, riparian restoration	Rural residential	Scalping around trees
Huhtanen-Scholler Place	10 acres	Nutrient management Oak and floodplain riparian planting	Rural residential Intact floodplain Horse ranch	Tinfoil for protection from small mammals
Bontrager Place	1-5 acres	Floodplain reconnection Wood placement and planting	Higher elevation rural residential	Removal of blackberry from planted stock
Buford Park	10-100 acres	Secondary channel development Floodplain planting	Public park Former cattle ranch	Scalping and mulching around stock

Field Assistants

In addition to the Geography 360X students, the Restoration Team was also responsible for training field assistants. During Winter Quarter, the Team decided that we needed to bring on additional students in order to complete the desired number of field sites. A two-credit-hour Field Studies course was advertised, several students were interviewed, and three were chosen. Field assistants were asked to accompany Team

Members in the field and were invited to attend weekly Team meetings. They were also invited (but not required) to attend the 360X field trips and classes, presentations to watershed councils and the final Service Learning Program presentations. Field assistants also helped with data entry and analysis.

Restoration Stewardship Monitoring Results

Table 3 summarizes the project sites completed during 2004-2005 for each of the partners involved. The Restoration Team tagged a total of 1479 trees and shrubs over Winter and Spring quarters. The table shows the number of plots set up for each restoration project, the number of species monitored on each site, the number of trees vs. shrubs measured and the total number of stock measured.

Table 3. Summary of all sites measured for each restoration group.

Council/Group	Project Name	# Plots	# Species	# Trees	# Shrubs	Total Stock
Long Tom	Will Bondioli's	6	3	122	-	122
353 plants	Huhtanen-Scholler	10	15	107	124	231
Buford Park	East Lobe	10	12	153	74	226
478 plants	Central Lobe	4	12	50	59	109
	West Lobe	7	7	132	11	143
M. Fk. Willamette	Bontrager Place	2	8	2	29	31
360 plants	Theiss Property	2	9	4	48	52
	Taylor's Place	2	7	5	38	43
	Moss Place	2	7	2	42	44
	Garcia Place	2	6	-	54	54
	Elijah Bristow	6	5	136	-	136
McKenzie/Mohawk	Cedar Creek	4	13	94	98	192
288 plants	Stafford Bridge	4	15	13	63	96

Data Summaries

The Restoration Team completed Project Summaries and Data Summary Tables for each of the sites monitored. Those reports are presented in Appendix C in the same order as listed in Table 3. In addition to these reports, photo monitoring was done on

Huhtanen-Scholler, Theiss, Garcia and Elijah Bristow projects and is available in a Microsoft Word format.

Presentation of Results

The Restoration Team gave three presentations of the results of their monitoring efforts. The first was to the Middle Fork Watershed Council in Oakridge with an hour-long PowerPoint presentation on the 18th of May 2005. The Team covered the background of the project, methods and measurements, and closed with and introduction of Middle Fork data and answering questions. The second presentation was to the Long Tom Watershed Council at a field tour near Junction City on the 31st of May 2005. The Team had a short 15-20 minute time frame with only a brief introduction to the project and collected data. The third opportunity was at the Service Learning Program final presentations on June 7, 2005, where all clients and participating landowners were invited to attend.

Outreach

As part of the reporting of results and general introduction to Restoration Stewardship, the Restoration Team created and published a website that resides on the University of Oregon, Environmental Studies, Service Learning Program web site. It has introductions to Team members, goals of our project, methods used, and examples of data gathered.

The Team also created a Restoration Stewardship Project poster complete with much of the same information as the website, though in a more condensed format. The poster has been displayed at the SLP final meeting and will be great for future presentations of results with watershed councils and restoration groups.

Lessons Learned

For an initial year, the Restoration Team was wildly successful and accomplished the majority of goals set out in Fall Quarter. Some tasks from the Work Plan were changed during the progress of the year, and still others may be incorporated into next year's experience. Listed below is a collection of changes, big and small, that were made in '04-'05 or likely will be in '05-'06.

- Use metal tags! Though more expensive and more difficult to etch, they will hold better than plastic tags used last year. Some plastic tags were breaking at the end of the season and all will likely have to be replaced.
- Have plant identification skills honed before starting monitoring. Fall Quarter '05 would be ideal for short trips introducing methods, plants and field skills.
- Have aerial photos ready for the first trip out to a site and mark plot locations on them.
- Use aerial photo marks and GPS locations to digitally place plot arrangements.
- Use GIS to determine/estimate total project size
- Arrange field gear in duffle bags, not boxes, for ease of transport on bikes and buses.
- Have access to two good digital cameras and GPS units
- Schedule a single large block of time once during the week, if possible, to reduce time spent traveling to sites.
- Monitor each site at a similar time to the previous year. Estimates of damage and vigor are sometimes different with or without leaves.
- Assigning a field leader per team was not helpful last year, but may work with modifications in '05-'06. It may work better to assign responsibility for a site to one person, asking them to track and/or complete all data collection, photo labeling, notes and summaries.

- Schedule
- Weekly meetings are a must and should be kept to 1.5 hours max.

- Field sessions should be firmly scheduled through Spring Quarter, as it is easy to get too busy to go out.
- Contemplate a minimum number of field hours necessary to "pass". Field trips are often displaced by weekend outings or events.
- When the Team is comfortable with data collection, move focus more strongly to data analysis and interpretation.
- Possibly drop landowner guide and list serve. We can direct interested individuals to watershed council websites and coordinators for restoration assistance. Interviews were a great experience for the students, but we may accomplish a similar goal with 360X field trips and summary reports.

Appendices

Appendix A – Restoration Monitoring Plan

Appendix B – Final Work Plan

Appendix C – Site Summaries and Data Tables