

**Project Title:**  
Project Tickle Creek

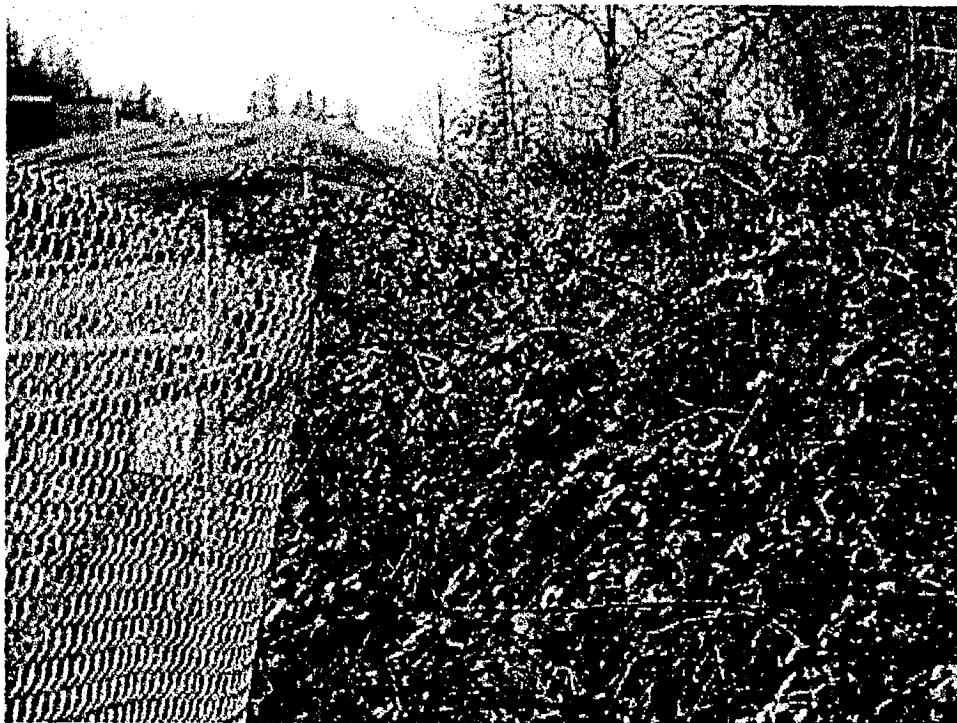


**Funding Year:**  
2001-2002

**Recipient Name:**  
Clackamas High School

A-1 Wetland - New North Clackamas School Site  
February 26, 2001

Site 1



Site 2



A-1 Wetland - New North Clackamas School Site  
February 26, 2001

Site 3



Site 4



A-1 Wetland - New North Clackamas School Site  
February 26, 2001

Site 5



Site 6





A-1 Wetland - New North Clackamas School Site  
February 26, 2001

Site 7



Site 8



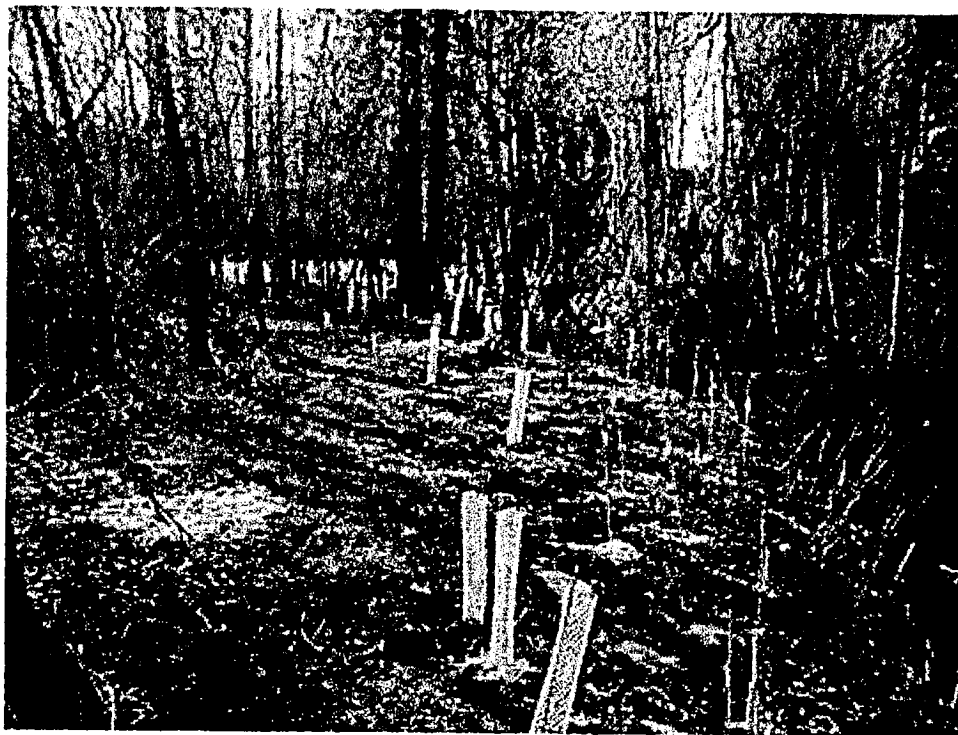
A-1 Wetland - New North Clackamas School Site  
February 26, 2001

Site 9



Deer Creek After Planting  
February 28, 2001

Site 1

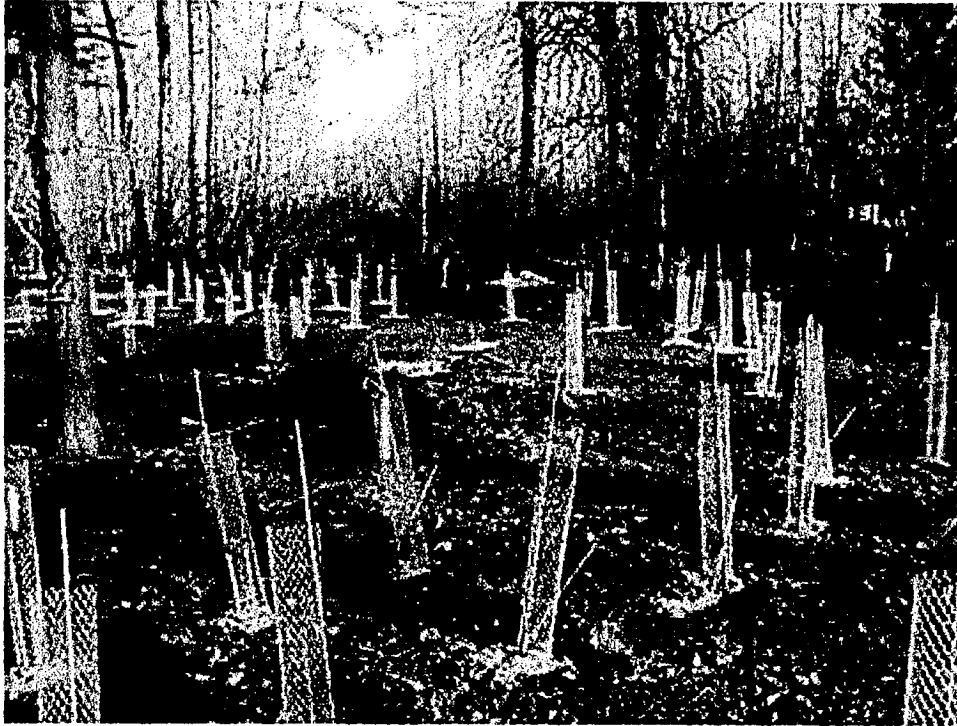


Site 2



Deer Creek After Planting  
February 28, 2001

Site 3



Site 4



Deer Creek Before Planting  
January 15, 2001

Site 3



Site 2



Deer Creek Before Planting  
January 15, 2001

Site 4



Site 3



Deer Creek Before Planting  
January 15, 2001

Site 4





### **Tickle Creek Project Description as it has actually occurred.**

The restoration project implementing the GIS monitoring is well underway on both the A-1 Wetland and the Deer Creek location. I will briefly break down the current status of each site including a description and maps of the geographical information systems (GIS).

A-1 Wetland is located on the site of the new Clackamas High School. Concern has been raised as to the impacts of the construction on the integrity of the wetland. Since 1999 Clackamas High School ecology students have been collecting data on soils, vegetation, water quality, amphibian status and physical encroachment of the construction. Following the purchase of the Sokkia GPS unit and the plotter, the ecology students have completed extensive GIS training in both with the GPS unit itself and with the matched ArcView software. Currently, the wetland boundary, piezometer locations and weekly data, photo-points, topography, and all CAD drawing of the new school layout have been imported into ArcView software. We are still waiting on permission to collect GIS points for the corners of the school so that we may orient the cad drawings on the Geo-tiff files. Having collected this baseline information, students are in the process of generating shape files for the location of critical amphibian habitat based on 2000 and 2001 census as well as looking for correlations between soil and vegetation type so as to link vegetation change to hydric cycle, should this occur in the future. Please see accompanying map for the current status of GIS implementation here.

Deer Creek is located southwest of the intersection of Sunnyside road and 82<sup>nd</sup> avenue. It has been the current site of both restoration and GIS monitoring. The county has named Clackamas High School, as a result of their contributions there, an official partner of the project. To date, over 600 hundred trees have been planted in four specific locations. This locations are study plots that Clackamas High School ecology students have been given charge of monitoring. Essentially, we are looking at the effects of two types of soil amendments, one for maintaining soil moisture and the other for fertilizer. It is our task to document the effects of these amendments. Additionally, the county has given us the task of documenting the presence and absence of native and nonnative vegetation, stream temperature data and structure, riffle to pool ratio and both vertebrate and macro invertebrate presence using GIS. Currently students have established photo-points, acquired geo-tiff files of the area, mapped the four different study sites, documented stream temperature fluctuation over a one month period in January and February and established points for structure in the streams. We are in the process of building the databases and communicating results of the baseline findings with all interested parties. Students have also surveyed and ran statistical analysis on the initial sizes of all vegetation planted this year as part of the area enhancement so as to provide a basis for comparison in growth rate of the different study plots in upcoming years. Please see attached map and pictures for details.

### **Goals and Benefits**

The intent of the project was to introduce students to real science applications as well as to get hands-on in-ground experience in the hopes of establishing a sense of appreciation for the environment and their own enhancement efforts. Students have really worked hard at both of our monitoring sites. Anecdotally, I can certainly say that student have really developed a sense of appreciation for the project. Students have volunteered their time outside of the classroom (two different Saturdays) planting over 600 trees. As this component was not required as part of the class, one can certainly infer that the students are being reached at an affective level through the work of this project. Additionally, several of the students have opted to continue their research next year as their final senior seminar project.



### **Work Tasks and Timelines as it actually happened.**

In December, students began a vegetation analysis on the Deer Creek site. This was completed by mid January. On January 21 and then again the second week in February, students planted trees. A total of 600+ trees were planted. At the January planting the study sites were divided up into their four quadrants. Photo points were taken on February 28<sup>th</sup> and all of the other GIS data was collected on the 1<sup>st</sup> day of March.

Work on A-1 wetland began in September. Student began collecting all of the county GIS data available. ArcView was used to generate maps of the data and as a database for all of the 2000 amphibian data, piezometer data, and photo points. Students met with Bora architects and acquired all of the CAD work for the new school in December. Piezometer photo points were established with GIS in January. Students have currently begun collecting amphibian data for this year and will be using the GIS to establish breeding areas in the wetland by the end of March.



**SALMONID EDUCATION & ENHANCEMENT GRANTS  
PROJECT BUDGET**

CATEGORY	GRANT REQUEST	MATCHING FUNDS*	MATCHING IN KIND*
<b>PERSONNEL</b>	\$0.00	\$0.00	\$600.00 – 40 hours (non-school time facilitating program @ \$20.00 per hour)
<b>VOLUNTEER LABOR</b> @ \$6.50 per hour	\$0.00	\$0.00	\$7,150.00- 20 students for 65 hours (approximately 9 weeks of service)
<b>PROFESSIONAL SERVICES</b>	\$0.00	\$0.00	\$2000.00 – donated service ArcView GIS Seminar (\$400.00 per person - 5 people total)
<b>MATERIALS&amp; SUPPLIES</b> list items and approximate cost	\$0.00	\$0.00	\$0.00
<b>RENTAL FEES</b>	\$0.00	\$0.00	\$0.00
<b>INDIRECT/OVERHEAD COSTS</b> Not grant eligible	\$0.00	\$0.00	\$0.00
<b>CONTINGENCY</b> Not grant eligible	\$0.00	\$0.00	\$0.00
<b>OTHER</b>	\$2249.00 for 75% of HP 42 inch 500 series 68% of Sokkia GPS Unit \$ 3992.80 per unit totaling \$2750.00	\$500 technology fund match for plotter (contingent upon success of grant) \$500.00 Eisenhower Fund match for plotter (contingent upon success of grant) \$20,000.00 Grant from Oak Lodge Water Providers to monitor, enhance and educate ecology students over a five-year plan. Diack Memorial Grant for \$1500.00 for field equipment	\$500.00ArcView Software with site license \$245.00 Lowrance G100 GPS unit \$ 690.00 Beacon receiver System Unlimited Supply of Native Vegetation donated by Cole Gardner
<b>TOTAL</b>	<b>\$4999.00</b>	<b>\$22,500.00</b>	<b>\$9,185.00</b>



### **Project staff, Workers and Volunteers**

The project has elicited help from several areas. The A-1 wetland site has been monitored strictly by my ecology 3-4 students with occasional service from our AmeriCorp volunteer who is establishing a nature study proposal for the site. The staff here in addition to myself would include Dave Church, physical plant supervisor, and Dean Winder, my principal.

The Deer Creek site has had both ecology 1-2 and ecology 3-4 students involved in all of the research and tree plantings. Additionally, the Key Club, Earth Club and many of my other science students have volunteered time and energy at the tree plantings. Many other community members and county workers have organized, designed and implemented enhancement efforts on the site.

### **How does the project relate to the Green Spaces Program**

The project focuses on education, enhancement, and monitoring of local green spaces. Its outcomes include community awareness, student appreciation for the environment, student understanding of ecology and its technological applications and finally, positive environmental impacts. All of these, I believe are the underlying goals of the Green Spaces Program. Additionally, as the project is a long-term project, the legacy of the grant monies will live on year after year fulfilling the fundamental goals of the program.

### **What worked, what didn't, helpful hints**

Currently, all appears to be working. GIS data is being successfully collected and analyzed, students are enjoying the work as well as learning a lot about GIS technology, community service and ecology. I would say that persistence seems to be the key to success. All sorts of obstacles and problems have been overcome, most of which have been associated with the GIS hardware or software. However it has all been a learning experience and all of us have benefited. Suggestions are difficult. I feel like my situation is different in that we are a high school. From an educational perspective, this has been an incredible experience for the kids and the legacy of the grant. The project is snowballing us into greater recruitment for the class next year and more hands-on community-based projects. My suggestion for others proposing projects that are both educational and hands-on is to start small and build a program. I have been piecemealing my program together for several years and it all of a sudden got big real fast. As I am the only project manager, this has been the cause of many sleepless nights wondering how I am going to fit all of this in with the student numbers this year. I suggest that when it feels overwhelming; just keep going and all of the problems and issues seem to work themselves out.

### **Advice for other project managers**

Organization has been the key to the success of my project. Project managers need to have a very clear vision of the outcomes of the projects, possible problems and hurdles along the way, and realize that the big picture disserves the focus rather than the minor successes and failures that occur on a daily basis. Working with young adults on a project as long term as their high school careers presents many challenges with the lack of continuity of your workers. You will essentially have to start over every year with the education process while at the same time, build on the project. Again, we fall back to organization. Data storage and analysis needs to follow strict protocols, be saved and backed up. If you are with a professional agency, protocols for data probably have already been developed. If you are with a school, I would suggest doing your homework!

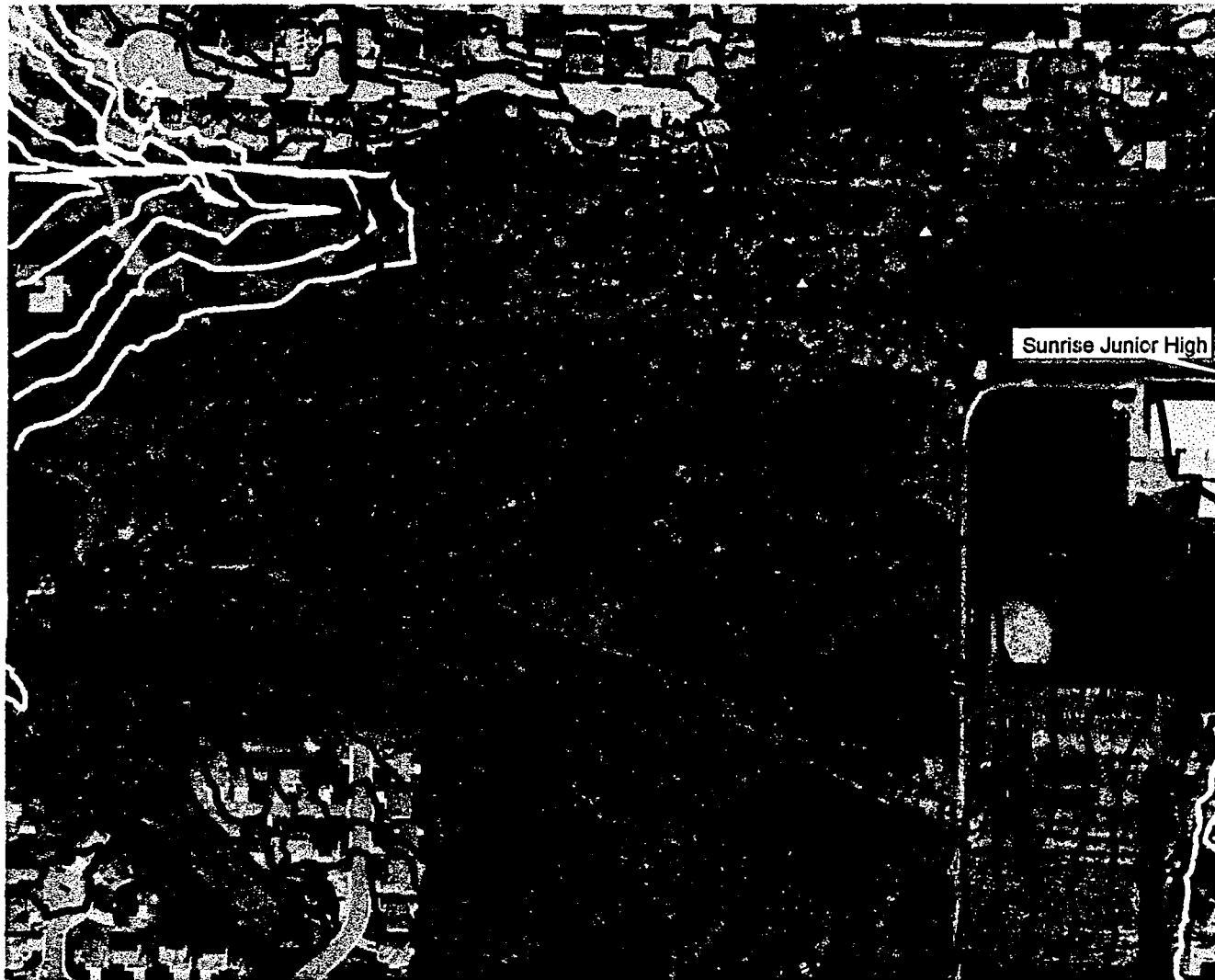
### **Monitoring and Maintenance Plan**

The monitoring and maintenance is paramount to the success of the plantings, educational component and management of the sites. Students will continue to evaluate Deer Creek and draw conclusions from the results of the soil amendments, amphibian counts, macro-invertebrate data, and ratio of native and non-native plant species, etc. Similarly, A-1 Wetland will be monitored for impacts, building on previous years findings. With the implementation of GIS and ArcView, students will have a more consistent format to store and analyze data and to do yearly comparisons. This should be the needed organizational format to reproduce a quality usable product. Both of these projects are long-term projects that will benefit the students of Clackamas High School and the local community for years to come. It will also provide a model for other long term monitoring projects that are an excellent educational tool for our young adults as well as positive environmental impacts.

### **Accurate Amount of Trees and Shrubs Planted**

There were 600+ native trees planted at the Deer Creek site. Any enhancement work at A-1 Wetland is waiting for the final mitigation plan following the construction of the new Clackamas High School.

# North Clackamas Site Topography Map



Wetland boundry  
Piezometer wells

1

2



3



4



5



6

Photopoint



1



2



3



4



5



6



7



8



9



10



11



12



13

Topography

312 - 322



322 - 328



328 - 334



334 - 340

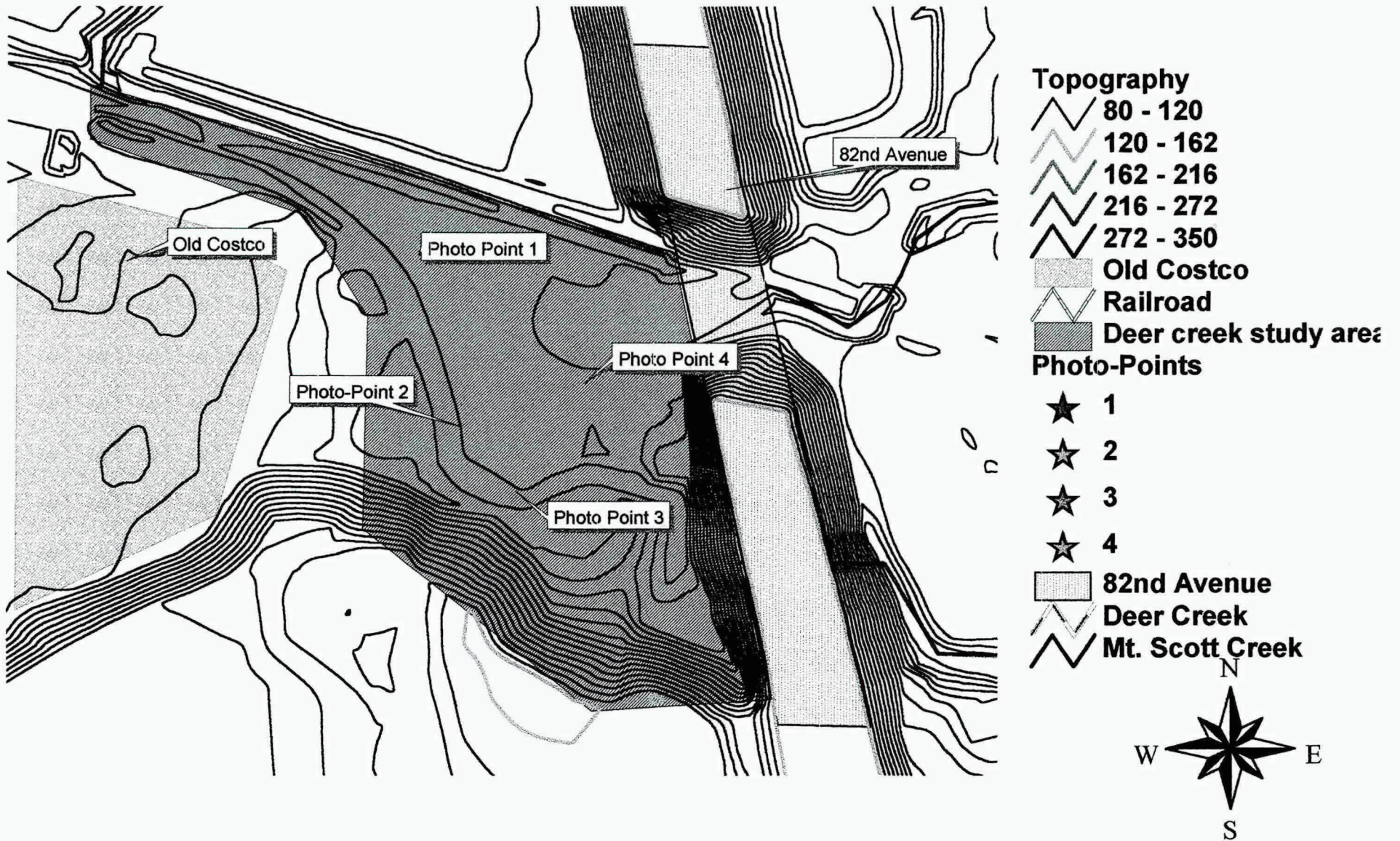


340 - 352

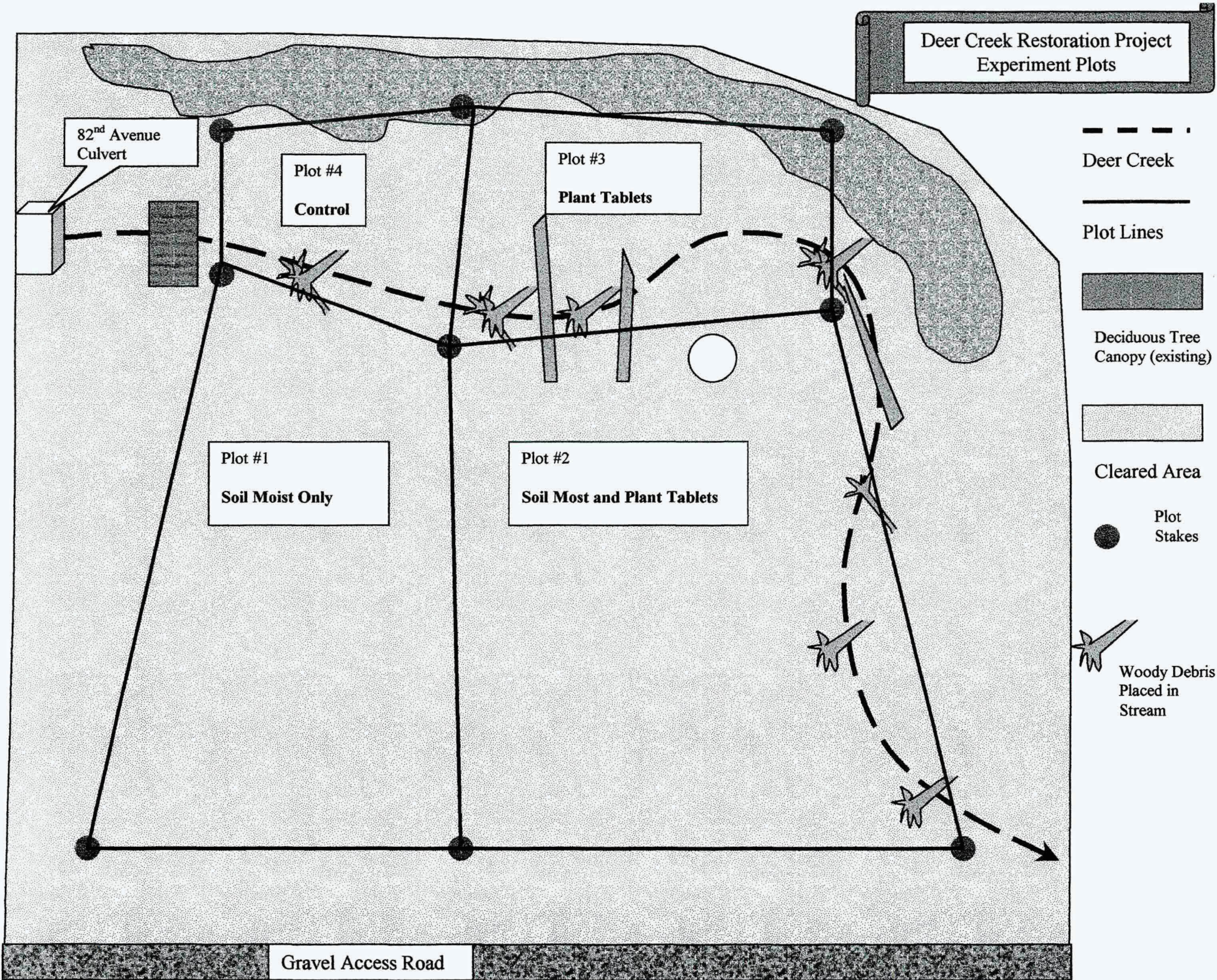




# Deer Creek Study Site and Enhancement Area









# North Clackamas Site Study Map



Wetland Boundry  
Piezometer Wells

- ▲ 1
- ▲ 2
- △ 3
- ▲ 4
- ▲ 5
- ▲ 6

Photopoints

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13





Deer Creek Before Planting  
January 15, 2001

Site 3



Site 2

