HABITAT RESTORATION AT CAMASSIA NATURAL AREA, LITTLE ROCK ISLAND PRESERVE AND SANDY RIVER GORGE PRESERVE

Final Report to the
Metro Regional Parks and Greenspaces

From
THE NATURE CONSERVANCY
of Oregon

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THE NATURE CONSERVANCY
HABITAT RESTORATION PROJECTS AT CAMASSIA NATURAL AREA, LITTLE ROCK ISLAND PRESERVE AND SANDY RIVER GORGE PRESERVE

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1. INTRODUCTION

The Metropolitan Greenspaces Program is a regional approach to protecting natural resources coordinated by Metro. The program is linking a mosaic of natural areas into connecting greenspaces, preserving fish and wildlife habitat, and creating greenway corridors for plants, animals and people. The specific objectives for grant recipients are restoring and enhancing fish and wildlife habitat sites to their original natural states. Under this grant, The Nature Conservancy, in partnership with The Northwest Service Academy of Americorps, completed habitat restoration projects at three of its Portland area preserves in 1996. All three projects aimed to restore fish and wildlife habitat to its original natural state (as best as possible); two were completed at riparian sites (Sandy River Gorge and Little Rock Island) and one at an upland site (Camassia).

The three projects are described individually in this report because each preserve is managed separately in a geographically distinct location of the metropolitan Portland area. Though each project is described individually, all three share the same goals and benefits. The primary intent of each project was to remove non-native species to allow growth and expansion of native species in area preserves, ultimately to restore the areas to their original natural state, as well as to protect critical biological diversity. An important associated benefit of restoration activities at these three preserves was education of the Americorps crews, increased public awareness of these preserves and the Greenspaces program, as well as education of the communities surrounding the preserves. One of the ways this community education occurred was by enlisting community groups that helped The Nature Conservancy and The Northwest Service Academy complete the restoration projects.

2. SPECIFIC PROJECT DESCRIPTIONS

A. Camassia Natural Area Habitat Restoration

Camassia's meadows and woodlands support a number of plant species that occur only rarely in the Willamette Valley. Two such species, *Delphinium leucophaeum* (pale

larkspur) and *Aster curtus* (white-topped aster), which occur in scattered subpopulations on the thin, rocky soils of the preserve are candidates for federal listing as threatened or endangered.

At Camassia habitat restoration activities included removal of the invasive non-native species Scotch Broom, English ivy, holly and Himalayan blackberry, allowing native species such as *Delphinium* and camas lily to become re-established.

The non-native plant species removal consisted of physical removal of the plants by digging them up, pulling them up, or cutting. Plants were left on site or removed as appropriate. If plants were not producing flowers or seeds, it was not critical to remove them from the area since they won't reproduce. The ivy was cut away from the trees and removed from other areas of the preserve as needed. Tools used included loppers, axes, saws, and pulaskis. A team of 10 workers plus a team leader from the Northwest Service Academy of Americorps worked for 10 days (not necessarily consecutively) to accomplish this physical removal.

Benefits resulting from these projects include improved habitat conditions for native plants and animals through control of non-native species. In addition, restoration activities will make hiking, bird-watching and wildflower observing more pleasant for all visitors since native plants will not be obscured by Scotch broom and ivy.

Evaluation Criteria: For Scotch broom removal, a physical survey of the site determined the successful elimination of all seed-producing adult plants. No blooming plants were found during the survey, thus the removal was successful. For English ivy removal, a survey determined that all trees had ivy stems severed and growth removed from the base of the tree to a distance of 10 feet. For the Himalayan blackberry and holly a survey was conducted and it was determined that growth was cut back to ground level. Overall success was monitored using photo plots for each area having a heavy concentration of non-native species. These same photo plots will be revisited for four years on an annual basis to monitor the results of the restoration

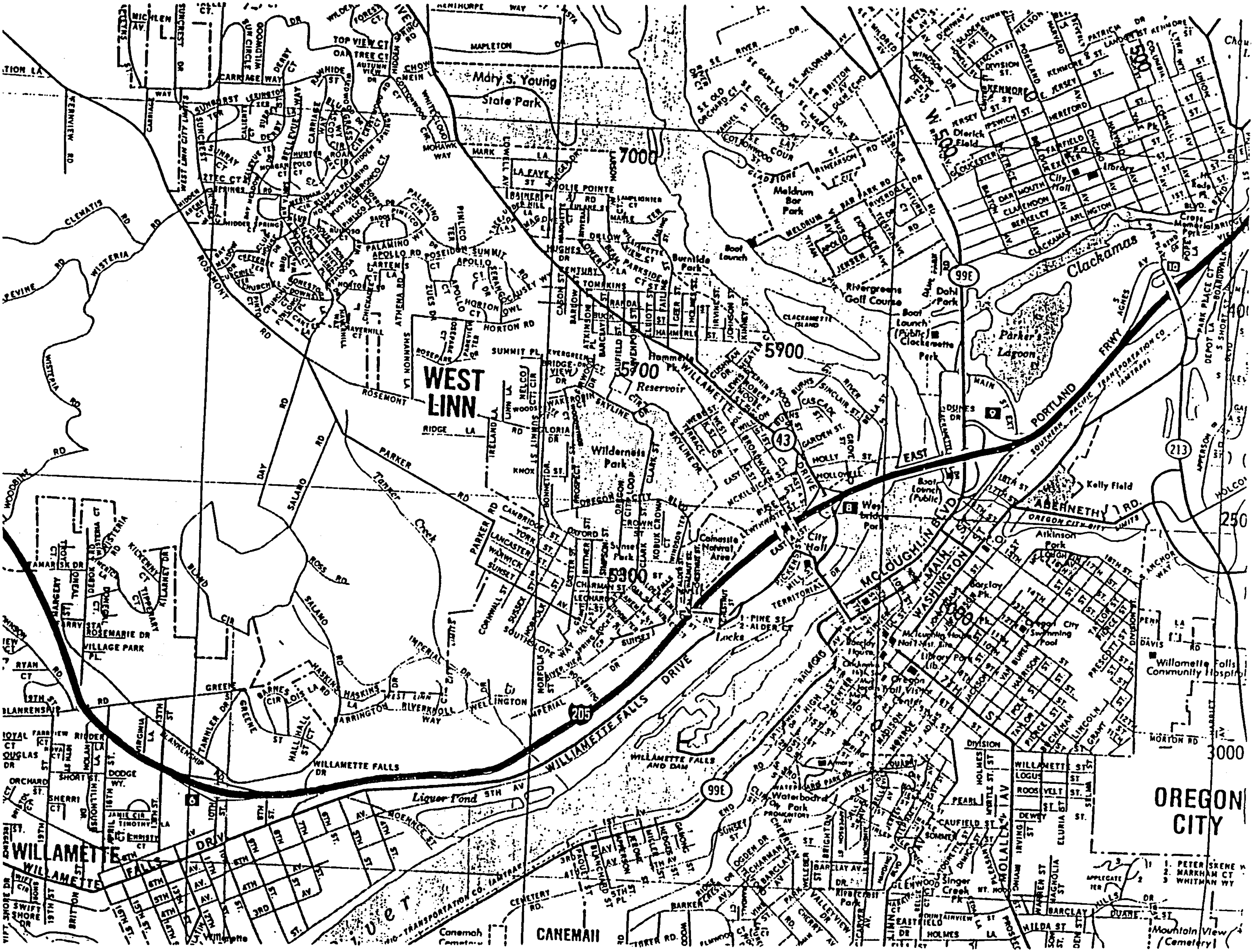
project. If seed-producing plants are found, then a volunteer work party will be organized to complete additional removals as necessary.

The following page is a map showing the location of the Camassia Natural Area, and on the page after that is a site map indicating in yellow the areas where restoration activities took place.

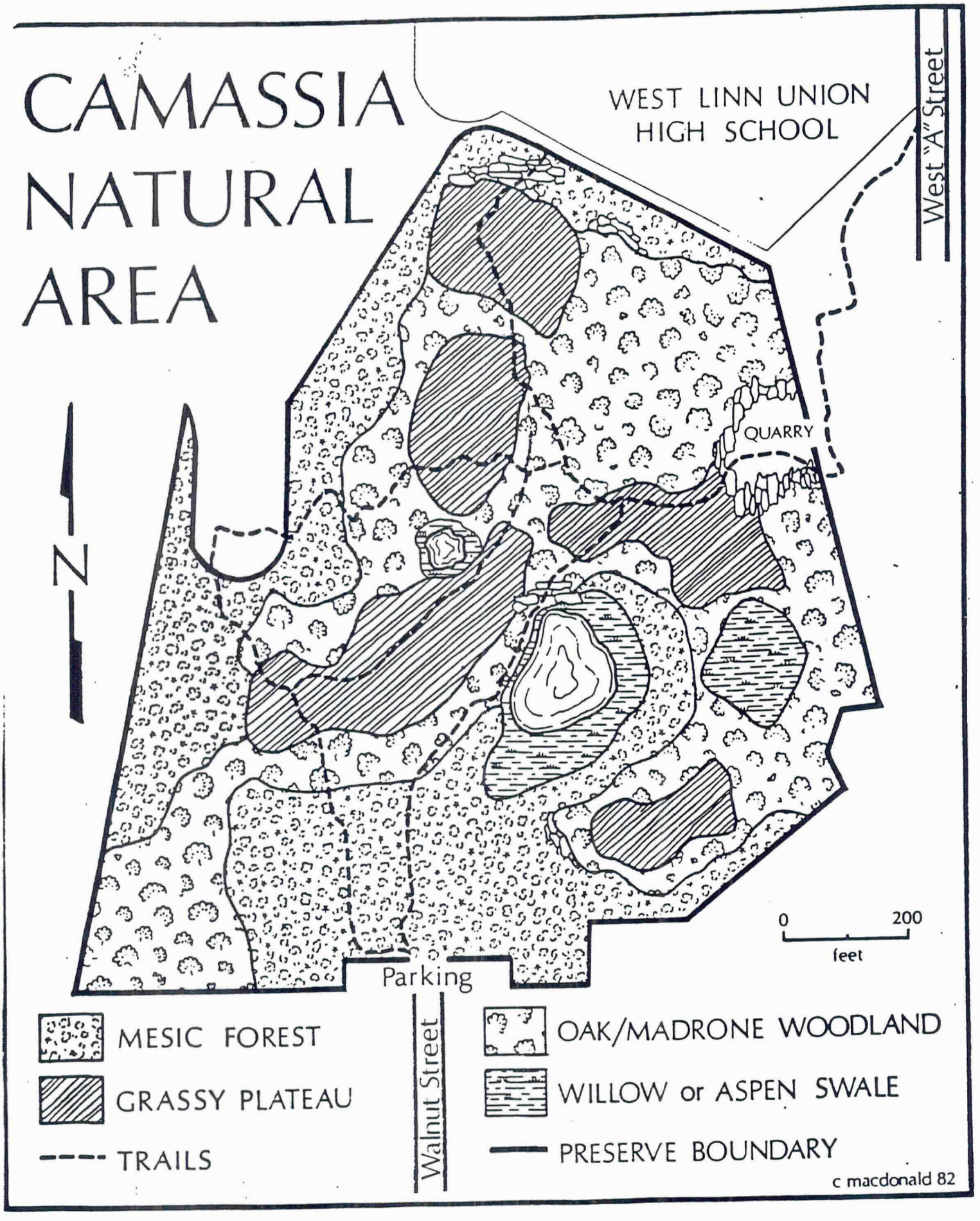
Long-term management: Long-term management of the Camassia Natural Area involves cooperation with the City of West Linn, West Linn High School and the neighboring community. The intent is to restore the area to its natural state ultimately requiring very little human intervention. Land use is to be limited to scientific and educational research as well as passive recreational opportunities such as hiking and wildlife viewing. A hydrologic study is being conducted by TNC, Oregon Episcopal School, West Linn High School, and the City of West Linn made possible by a Greenspaces environmental education grant. TNC is responsible for long-term monitoring of all physical and biological resources of the natural area. (See Appendix.)

B. Little Rock Island

Little Rock Island is a basalt rock outcrop island in the Willamette River 3 miles upriver from Willamette Falls at river mile 30. Little Rock Island, Rock Island, and the adjacent western shore of the Willamette River support the largest remaining population of *Delphinium leucophaeum*. *Delphinium*, or pale larkspur, inhabits oak savanna and woodland habitat on shallow peat or sandy soils. Little Rock Island is entirely within the Willamette River Greenway. It is in a relatively scenic and sparsely developed section of the Willamette River. The plant communities on the islands are in relatively natural conditions and have an interesting mix of western and eastern Oregon species.


WEST LINN
OREGON CITY
WILLAMETTE
CANEMAH
Mary S. Young State Park
Wilderness Park
Reservoir
Hammerle Pk.
Burnside Park
Meldrum Bar Park
Boat Launch
Rivergreens Golf Course
Clackamette Island
Clackamette Park
Dahl Park
Parker's Lagoon
Clackamas
Cross Memorial Park
Dierick Field
Library
City Hall
Kelly Field
Atkinson Park
Camassia Natural Area
West Bridge Park
Locks
Sunset Park
Barclay Pk.
Oregon City Swimming Pool
McLoughlin House Nat'l Hist. Site
Library Park (Lib.)
Oregon Trail Visitor Center
Armory
Waterboard Park
Singer Creek Pk.
Willamette Falls Community Hospital
WILLAMETTE FALLS AND DAM
Liquor Pond
Canemah Cemetery
Mountain View Cemetery
Willamette
ROSEMONT RD
PARKER RD
SALAMO RD
WILLAMETTE FALLS DRIVE
WILLAMETTE DR
McLOUGHLIN BLVD
EAST PORTLAND FRWY
ABERNETHY RD
SOUTHERN PACIFIC TRANSPORTATION CO. (AMTRAK)
MAIN ST
WASHINGTON ST
MOLALLA AV
WISTERIA RD
CLEMATIS RD
HORTON RD
MELDRUM BAR PARK RD
MORTON RD
HOLCOMB
7000
5900
5700
5300
4900
3000
250
99E
43
205
213
1. PETER SKENE W
2. MARKHAM CT
3 WHITMAN WY

CAMASSIA NATURAL AREA



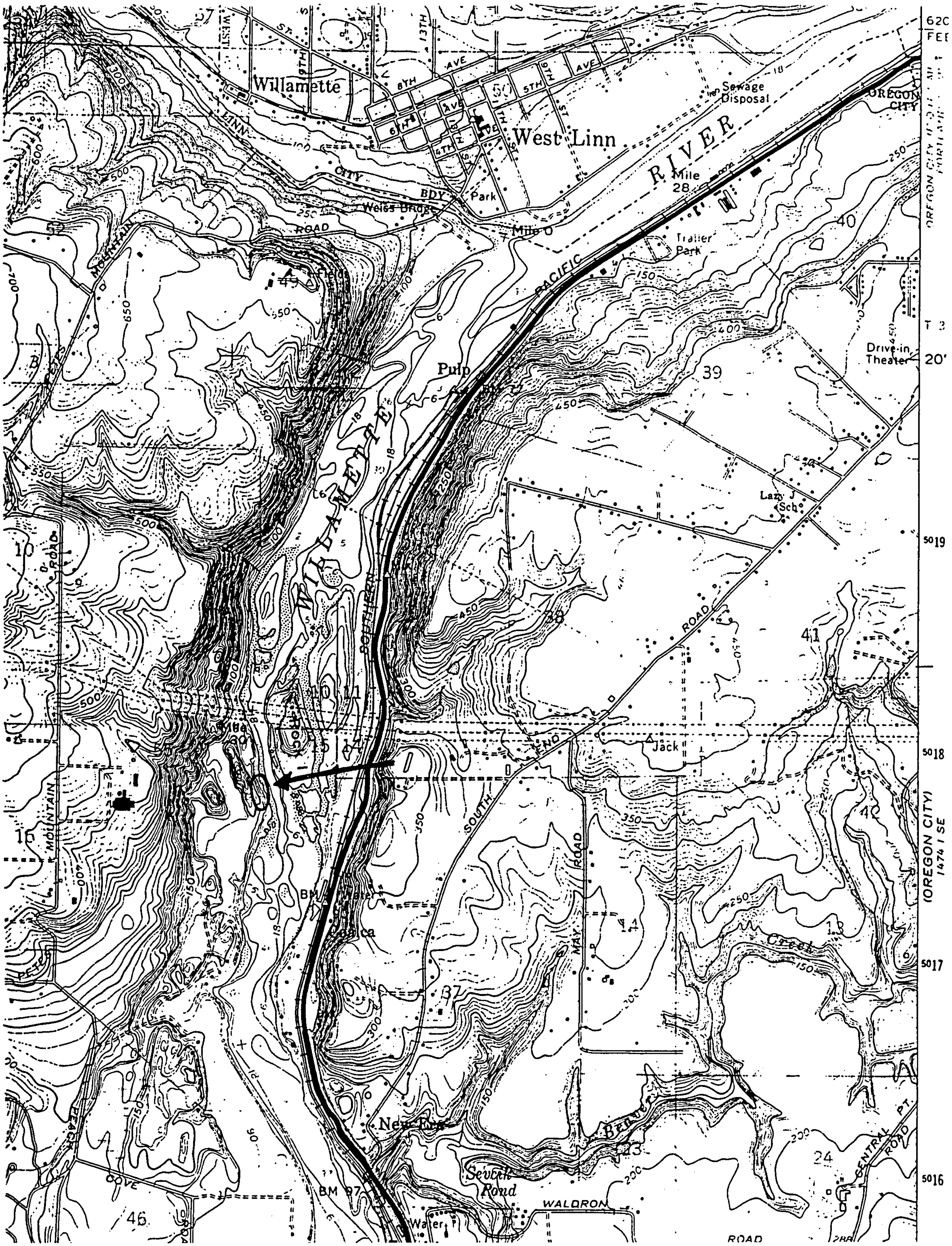
The project undertaken at Little Rock Island was removal of all Scotch broom. The project used a work team of 10 (plus a team leader) from the Northwest Service Academy of Americorps for a week to pull and stockpile the Scotch broom. Since the island is accessible only by boat, workers were ferried over to the island from the West Linn Willamette Park boat launch. The City of West Linn provided the boats and access to the boat launch for transport of workers to the Little Rock Island preserve.

The benefit of this project has been restoration of the natural island habitat for plants and animals, and protection of the largest remaining population of *Delphinium leucophaeum*.

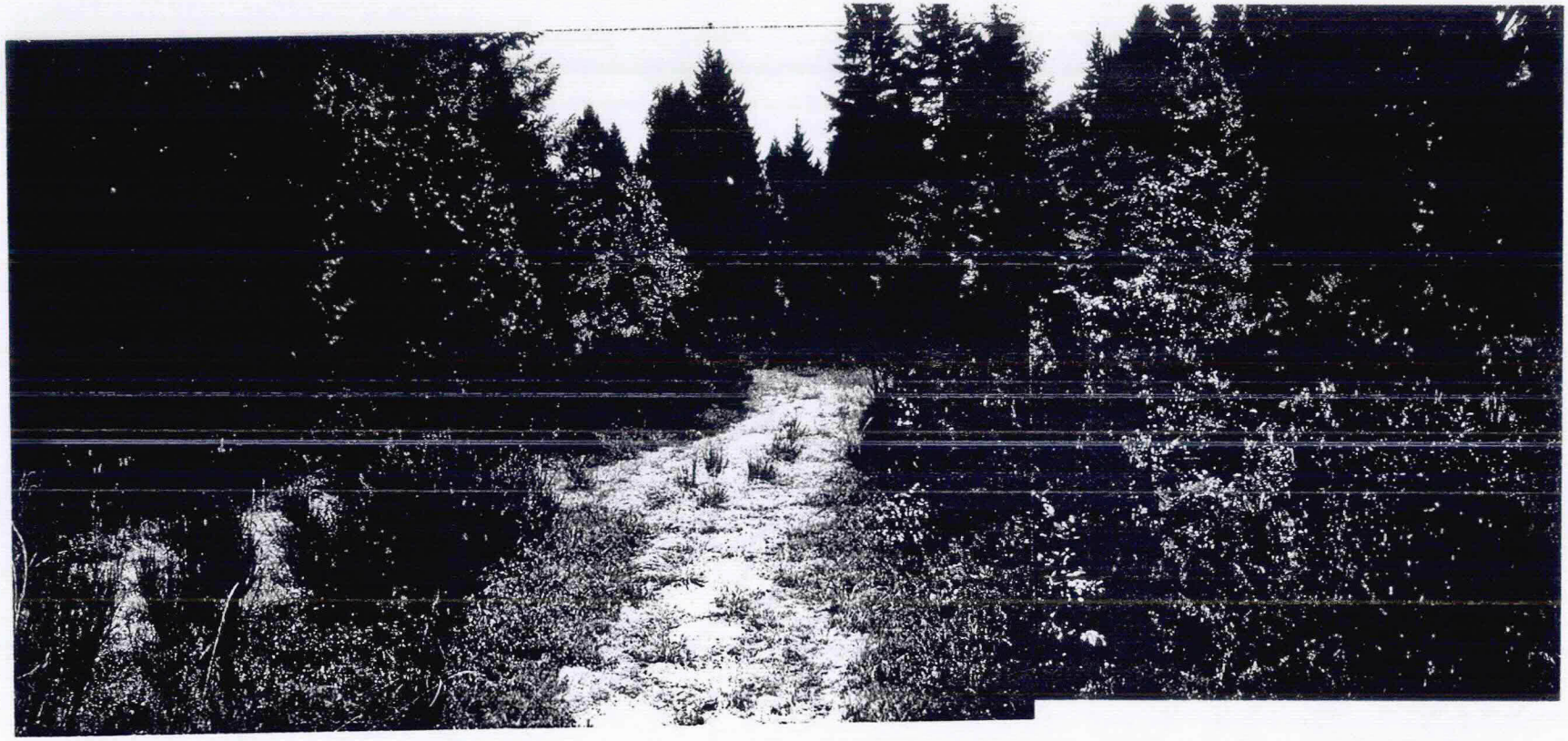
Evaluation Criteria: For Scotch broom removal, a physical survey of the site determined that successful elimination of all seed-producing adult plants took place. Overall success was monitored using photo plots for each area having a heavy concentration of non-native species. These same photo plots will be revisited for four years on an annual basis to monitor the results of the restoration project. If seed-producing plants are found, then a volunteer work party will be organized to complete additional removals as necessary.

On the following page is a map showing the location of the Little Rock Island Preserve, with the photo plot location indicated by a circle. On the page after the map are before and after photos taken of the area indicated by the circle on the map. While the photos are not from the Conservancy's preserve, they are representative of the work that was done on the island as well as the surrounding area.

Long-term management: TNC is in partnership with the Oregon Parks and Recreation Department and has an agreement regarding 20 acres of land on the western shore of the Willamette River in addition to Little Rock Island. The intent is to restore the island to its natural state. TNC is responsible for long-term monitoring of all physical and biological resources of this area. (See Appendix.)


Willamette
West Linn
Sewage Disposal
OREGON CITY
RIVER
Mile 28
Park
Weiss Bridge
Mile 0
Trailer Park
PACIFIC
Pulp
WILLAMETTE
SOUTHERN
Drive-in Theater
Lazy J Sch
Jack
SOUTH END ROAD
MAY ROAD
MOUNTAIN ROAD
Creek
New Era
BM 97
Waldron
Central Pt. Road
Cove
Peach
(OREGON CITY) 1474 I SE

After: Photo of same road in Sandy River Gorge Preserve after Scotch broom removal.



Before: Photo of area along Sandy River shore in Sandy River Gorge Preserve showing Scotch broom along road.

C. Sandy River Gorge Preserve

The Sandy River Gorge consists of 436 noncontiguous parcels separated from each other by either public or private land or the river itself, and is adjacent to Metro's Oxbow Park. The Sandy River is habitat for diverse aquatic and terrestrial wildlife. Of greatest importance within this preserve is the low elevation old-growth forest and the rare amphibian species that live in the habitat provided by the preserve.

The habitat restoration project completed at the Sandy River Gorge was eradication of non-native species from TNC's tracts of the preserve, which are just upriver from Oxbow Park at River mile 14 and 17. The species targeted were Scotch broom, Himalayan blackberry, ivy and holly. The project was conducted over three weeks' time. A total of 5 days was required to complete the removal at locations near River mile 14, which was accomplished by physical removal of the plants. Near River mile 17 The Nature Conservancy and The Northwest Service Academy crews were unable to complete removal of Scotch Broom because of the size of the area and difficulty with removal. This removal used loppers, saws, pulaskis and axes. The Northwest Service Academy of Americorps provided a team of 10, plus a team leader, for pulling the Scotch broom and other non-native species for a total of two weeks.

The primary benefit of this project is preservation of old-growth and second-growth forest and preservation of habitat for the slender salamander.

Evaluation Criteria: A physical survey of the site determined the successful elimination of all seed-producing adult plants at River mile 14, but incomplete removal at River mile 17. Overall success was monitored using photo plots for each area having a heavy concentration of non-native species. These same photo plots will be revisited for four years on an annual basis to monitor the results of the restoration project. If seed-producing plants are found, then a volunteer work party will be organized to complete additional removals as necessary.

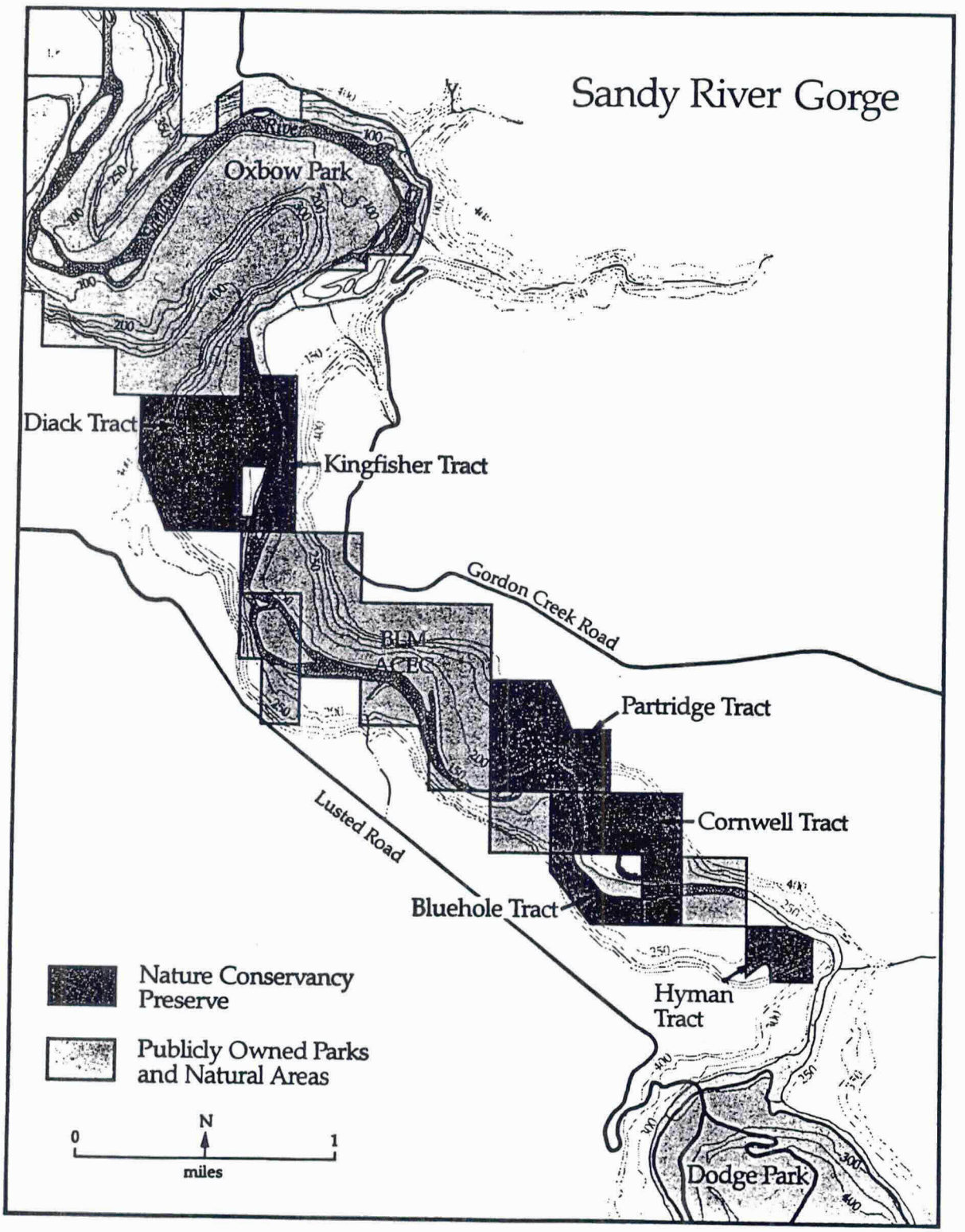
On the following page is a map showing the Sandy River Gorge Preserve and surrounding parks and natural areas, with the approximate location of the representative photo plot indicated by an arrow. On the page after the map are the before and after photos of the plot indicated on the map.

Long-term management: The Sandy River Gorge Preserve is part of the 12-mile scenic river corridor that is managed cooperatively by a number of local, state and federal agencies as well as TNC. These agencies include BLM, ODFW, State Parks, Multnomah County, METRO, Oregon Trout, Portland Steelheaders, BPA, PGE, Oregon Water Resources and the City of Portland to maintain the structure, composition, function and dynamics of the low elevation old-growth forest on 600 existing acres and to restore the same to 2500 acres of second-growth forests including habitat for the Oregon slender salamander. In addition, long-term management focuses on protecting the structure, composition, function and managing the hydrologic regime to mimic the natural hydrologic regime of the Sandy River with special attention to habitat conditions for lower Columbia River spring chinook salmon. (See Appendix.)

3. SUGGESTED IMPROVEMENTS/ADVICE TO PROJECT MANAGERS

It is important to adapt Scotch broom and blackberry removal techniques for each site, since every site has unique conditions requiring special methods. These unique conditions include the type of soils present, the depth of soils, and soil composition (such as sandy or rocky, moisture content, etc.). In addition, proximity of the species targeted for removal to other species determines whether roots might be entangled, and if they are entangled, this requires especially careful removal by two-person teams. Thus, it is vital to understand the ecological variables at each site. Because a technique succeeds at one site does not mean it will succeed at another site.

For example, at Camassia and Little Rock Island, the same Scotch broom removal techniques were effective: cutting the large (waist-high or taller) plants in the root


Sandy River Gorge
Oxbow Park
Diack Tract
Kingfisher Tract
Gordon Creek Road
BLM
ACEC
Partridge Tract
Lusted Road
Cornwell Tract
Bluehole Tract
Hyman
Tract
Dodge Park
Nature Conservancy
Preserve
Publicly Owned Parks
and Natural Areas
N
0
1
miles

section of the plant with loppers and pulling them removed most of the Scotch broom. At Sandy River, on the other hand, two-person crews and pulaskis were required. The first person would grub at the root of the plant with the pulaski while the second person gently pulled on the plant. This was necessary because the soil was very rocky and the roots were often intertwined with roots of nearby plants. Blackberries were cut back with shears and machetes, then pulaskis and three-clawed rakes were used to dig out the roots. If the blackberry roots are not removed, then immediate re-sprouting of the tops occurs. Therefore it is critical to remove as much of the blackberry root system as feasible.

If at all possible it is extremely desirable to keep either consistent team members or team leadership among the crews doing the field work. This is important from both a morale and training standpoint. If the leadership or team membership changes frequently, then the responsibility lies with the project manager to train the new people and familiarize them with both the physical and ecological aspects of the project.

4. **WORK PLAN AND SCHEDULE** (See schedule on the following page)

The work plan and schedule presented in the proposal was not modified, and is presented here for your information.

5. **PROJECT BUDGET** (see budget table on page following the work plan and schedule)

TNC received $5,000 from METRO to cover the contract labor costs of the Northwest Service Academy team, which was $1,000 per week. The in-kind match in this column was calculated at the same level of effort based on 10 people per team, plus the team leader, at the volunteer labor hour cost of $4.75/hour.

Materials and supplies were provided by TNC or the Northwest Service Academy.

Work Plan

Tasks	1996							
	Mar	Apr	May	June	July	Aug	Sept	Oct
Camassia								
Scotch Broom removal in plateau areas	←							→
English Ivy removal in forested areas	←							→
Non-native species removal in "trail triangle"	←							→
Little Rock Island								
Secure bardge service for Scotch Broom removal				←		→		
Arrange for work parties to get to and from island				←		→		
Removal of Scotch Broom				←		→		
Sandy River								
Arrange for work party transportation and equipment					←			→
Volunteer coordination					←			→
Removal of exotics						←		→

Project Budget

Category/Item	Metro	Cash	In-Kind	Total
Personnel (contract labor)				
Camassia	$ 1,000		$ 2,200	$ 3,200
Little Rock	1,000		2,200	3,200
Sandy River	3,000		6,600	9,600
Materials & Supplies				
Camassia			$ 830	$ 830
Little Rock			830	830
Sandy River			830	830
Professional Services				
Camassia			$ 200	$ 200
Little Rock			800	800
Sandy River			1,600	1,600
Volunteer Labor Hours (@ $4.75/hour)				
Camassia			$ 310	310
Little Rock			310	310
Sandy River			310	310
Indirect Costs/Overhead				
Camassia			$ 38.80	$ 38.80
Little Rock			38.80	38.80
Sandy River			38.80	38.80
Total	$ 5,000		$ 17,136.40	$ 22,136.40

Professional services were calculated assuming $25/hour for TNC staff time. Eight hours of staff time were required for Camassia, 32 for Little Rock, and 64 for Sandy River restoration projects. The hours required for Little Rock and Sandy River were much greater than originally estimated because more difficult conditions were encountered at these sites, requiring much more on-site training by TNC staff.

Volunteer labor hours (for TNC volunteers already scheduled to perform non-native species maintenance activities) were about 65 hours per nature preserve over the course of the project schedule.

Indirect costs and overhead were calculated at 19.4 percent of TNC's professional services costs.

6. Key Staff Personnel

Eddie Huckins, Project Contact Person and representative for The Nature Conservancy. B.S. Forestry degree with major in wildlife management and range science. Steward for Camassia Natural Area, Sandy River Gorge and Keller Woodland Preserves for nearly 3 years. He is fully committed to providing the leadership and coordination necessary to ensure successful project accomplishment.

Lupine Jones, Volunteer Program Manager for TNC. Responsible for coordinating with Northwest Service Academy of Americorps, as well as coordinating TNC volunteers for project activities. For three years before coming to Oregon, Lupine was the Membership/Volunteer Coordinator for TNC in Salt Lake City. Lupine attended the University of Oregon and the University of Utah, graduating with a political science degree with public policy emphasis. Lupine is committed to ensuring smooth coordination of projects, participants and successful implementation of the plans.

Rebecca Johnson, Team Steward and Mentor, Metro Center, Northwest Service Academy of Americorps. Responsible for coordination of Americorps teams to conduct project activities. Rebecca has worked with the Northwest Service academy since its inception. She was responsible for a ten-member team of adult volunteers for the entire year of their service. During that year she spent several months planning a six-week summer project with TNC during which work was completed at preserves throughout Oregon. As a mentor for team stewards this year, and responsible for 40 of the Center's 70 members, her goals include creating opportunities for member development through projects and educational opportunities. She is committed to working with TNC to meet the service needs of the proposed projects and to create educational opportunities for the Academy's teams.

APPENDIX

Preserve Management Plans (applicable excerpts)

Camassia Natural Area

Little Rock Island Preserve

Sandy River Gorge Preserve

CAMASSIA NATURAL AREA

Reduce the frequency of non-native species inhabiting Camassia to less than 50% per m^2.

Objective 1.

Eradicate Priority One species *Cytisus scoparius* (CYSC) and *Hedera helix* (HEHE).

Both *Cytisus scoparius* and *Hedera helix* are serious threats to Camassia's indigenous plant population and are considered priority one species for removal. Due to their high rate of reproduction, control efforts should be pursued as often as funding permits. Both species are effectively controlled by manual removal and disposal off-site. Pulls should be scheduled for mid-summer when soils are dry and impact minimal and should be completed by volunteer work parties or the Northwest Youth Corps. Once most large stands are removed, pulls can be scheduled bi-annually to allow for natural thinning and seedling mortality. A monitoring program needs to be established to determine the success of CYSC and HEHE removal efforts.

Action Strategies:

- Determine rate of return and resprout by CYSC and HEHE in areas that are hand pulled.
- Establish a formal study plot to determine the most effective means of CYSC and HEHE removal.
- Determine rate of return by native species in areas of Scot's broom and English ivy removal.
- Discourage visitors from wearing Vibram-soled boots during the wet season to minimize impact to the grassland.
- Continue annual removal of CYSC and HELE until cover of Scot's broom is reduced to <10%.

Objective 2:

Eradicate priority two species *Rubus procerus*, *Ulex ulex*, *Senecio jacobaea* and the introduced grasses.

Priority two species – *Rubus procerus*, *Ulex ulex*, *Senecio jacobaea* and the introduced grasses – are all considered to be of lower management priority than Scot's Broom and English Ivy. None of the three dicots poses an immediate threat to the preserve. All have the potential for expansion, however, and are not considered desireable additions to the preserve. Efforts to contain them will be contingent on funding. Exotic grasses at Camassia are secondary in priority mainly because of the difficulty in controlling them. Until a good method is devised for promoting dominance by native grasses, these exotic species will most likely go uncontrolled.

Action Strategies:

- Determine the rate of priority two species expansion through continued monitoring.
- Begin removal of prioity two species as time and funding allow.
- Recruit volunteers to aid in the removal of priority two species.
- Conduct literature searches and interviews with experts to determine the most effective methods for removing exotic grasses.

Little Rock Island
Site Conservation Plan

Overview:

Little Rock Island is a basalt rock outcrop island in the Willamette River __ miles upriver from Willamette Falls at river mile __. Little Rock Island, Rock Island, and the adjacent western shore of the Willamette River (Fig. 1) support the largest remaining population of Delphinium leucophaeum (author, etc.) (pale larkspur). Delphinium leucophaeum, a perennial, is a G2S2 species known to occur at ___ sites in the northern Willamette Valley in Oregon and the southern Puget Trough in Washington. A second, but much smaller, population of DELE occurs at the Camassia Preserve, located __ miles north of Little Rock Island.

Delphinium leucophaeum inhabits oak savanna and woodland habitat on shallow peat or sandy soils. It occurs under various light conditions ranging from direct sunlight to __ shade. Associated vegetation varies greatly from various native and non-native grasses and forbs in grassland habitats to various trees, shrubs, and ferns under shaded conditions. Little Rock Island was donated to The Nature Conservancy in 198_ by the James River Corporation. In addition, we have a management agreement? with State Parks on 20 acres on the western shore of the Willamette that includes approximately __ acres of occupied habitat for the species. The site is entirely within the Willamette River Greenway, a state designation that provides minimal protection to riparian habitats. Together, the two tracts support approximately __% of the population.

The primary stresses to DELE include: competition with non-native species, especially Cytisus scoparius (Scots Broom), trampling from unauthorized use of the island and shore, primarily from river-related recreational activity and...

Biodiversity Rating: The Little Rock Island site protects the largest population of Delphinium leucophaeum, a G2S2 species known from __ sites. It is a B site as defined by the b-d ranking criteria. The population is large (__ individuals) and appears relatively stable with a wide range of size and status.

Other Values: The site is in a relatively scenic and underdeveloped section of the Willamette River. The plant communities on the islands are in relatively natural conditions and have an interesting mix of western Oregon and eastern Oregon species.

Ecological Model:

The species is perennial and takes 5-6 years to reach maturity. Adult plants do not flower every year, but may remain dormant or as a vegetative plant in some years. The cause of these transitions is unknown. At Camassia, where the population has been monitored for over 10 years, the population varies dramatically from year to year.

It appears to occupy and go extinct locally, however this may be factor of the dormancy or inadequate searching in the past.

Seeds germinate and plants begin to grow in February or March, depending on weather conditions. Seedlings and vegetative plants die back in __.

Flowering plants bolt in April and begin to flower in May. The inflorescence are indeterminant. The flowering period typically lasts ___ weeks. Dry weather conditions during the spring may limit reproductive output, as the inflorescence dry out prior to seed development. Especially wet conditions may also limit reproduction by limiting pollination (check to see if they self).

The variety of habitats occupied by DELE make it difficult to assess germination and requirements and other factors affecting development rates. Seedlings typically grow in sites with 1-3 cm litter and in and amongst dense grass cover. Moisture conditions during the spring probably determine the length of the growing season and therefore have an effect on the number of years required to reach maturity. (Check temperature variation and rain in Feb., April-June. Frost?).

The role of fire, flooding, and other natural disturbance agents such as herbivore, small mammal disturbance is poorly documented. We have observed and documented survival of DELE following fire at Camassia, but due to the extremely erratic nature of the subpopulations there, it is difficult to determine whether DELE is positively or negatively affected by fire.

DELE occurs at approximately __ meters above 10 flood stage levels. Portions of the population may be inundated in storm events. Due to the basalt substrate in this reach of the river, disturbance from erosion and deposition resulting from hydrologic forces is likely fairly minimal.

Threats:

Stress	Source	Scale	Potential Rate of negative chge	Manageabil.
Competition	Scots Broom	75-90%	High	Good*
	Non-native gr.	50%	Low	Unknown

Trampling	River Recr. -Picnicking -Camping	10%	Moderate	?
	-Poaching	10%	Moderate	?

Feasibility Analysis:

Summary of Conservation Issues:

Non-native Species
Public Use

Partners:

- Oregon Parks
- County Sheriff
- Local universities

Volunteer opportunities are good.

SANDY RIVER GORGE PRESERVE

ECOLOGICAL AND PROGRAM GOALS

A. Ecological Goals

1) Maintain the structure, composition, function and dynamics of the low elevation old-growth forest on 600 existing acres and restore the same to 2500 acres of second-growth forests including habitat for the Oregon slender salamander by 2095.

2) Protect the structure, composition, function and manage the hydrologic regime to mimic the natural hydrologic regime of the Sandy River with special attention to habitat conditions for lower Columbia River spring chinook salmon.

B. Program Goals

1) Increase Portland Metro resident's understanding of the importance of the conservation of biological diversity.

2) Increase membership with fish and wildlife groups.

3) Expand agency and NGO involvement in the protection of the Sandy River with specific targets on: BLM, ODFW, State Parks, Multnomah County, METRO, Oregon Trout, Portland Steelheaders, BPA, Portland General Electric, Oregon Water Resources, and City of Portland.