HR '91-93
90-275

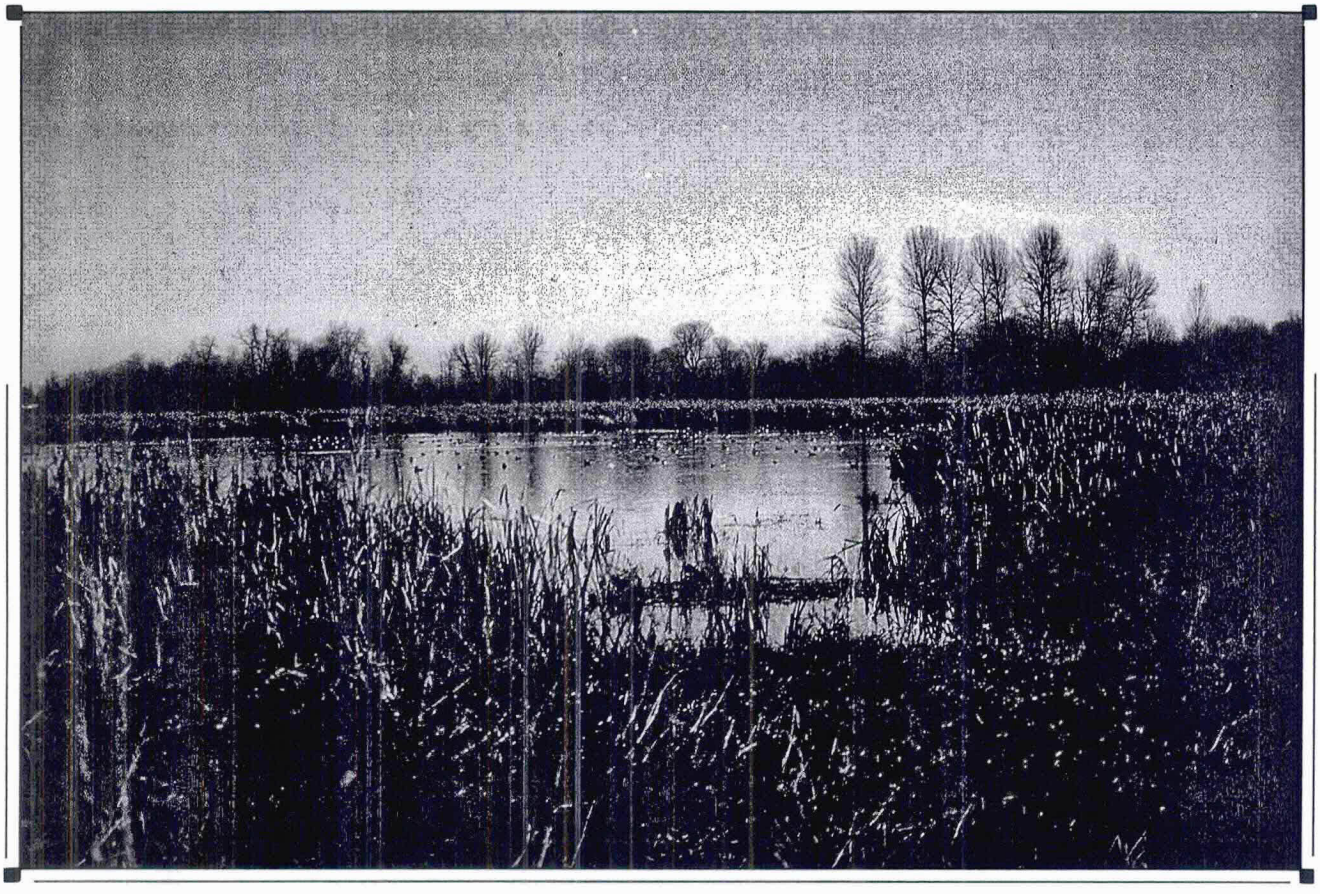
CITY OF GRESHAM
DEPARTMENT OF ENVIRONMENTAL SERVICES
PARKS AND RECREATION DIVISION

GREENSPACES RESTORATION PROJECT
BINFORD LAKE/BUTLER CREEK GREENWAY

COMPLETION REPORT

The implementation of the primary area enhancement activities, including creek bank stabilization, revegetation, wildlife and fisheries habitat restoration and trail improvements have been completed with the exception of additional creek and lake side plantings. This additional work will be completed in 1993 utilizing volunteers during a more conducive time of year for planting natives. The additional work will be undertaken once the conditions are conducive for plant survival.

The project will be monitored on an ongoing basis, inclusive of the 4 year requirement, by the Division staff, local neighborhood and immediate residents. It has been determined as a high priority, per our 1988 Park & Recreation Master Plan with additional improvement plans scheduled for September, 1993 and 1994.



# FERNHILL WETLANDS

## CONCEPT MASTER PLAN

June 1992

# FERNHILL WETLANDS

## CONCEPT MASTER PLAN

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June, 1992

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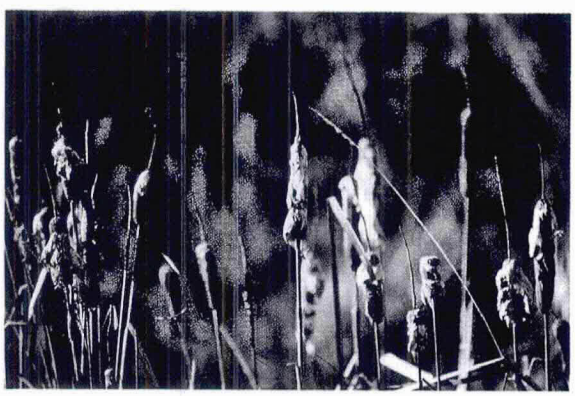
# INTRODUCTION

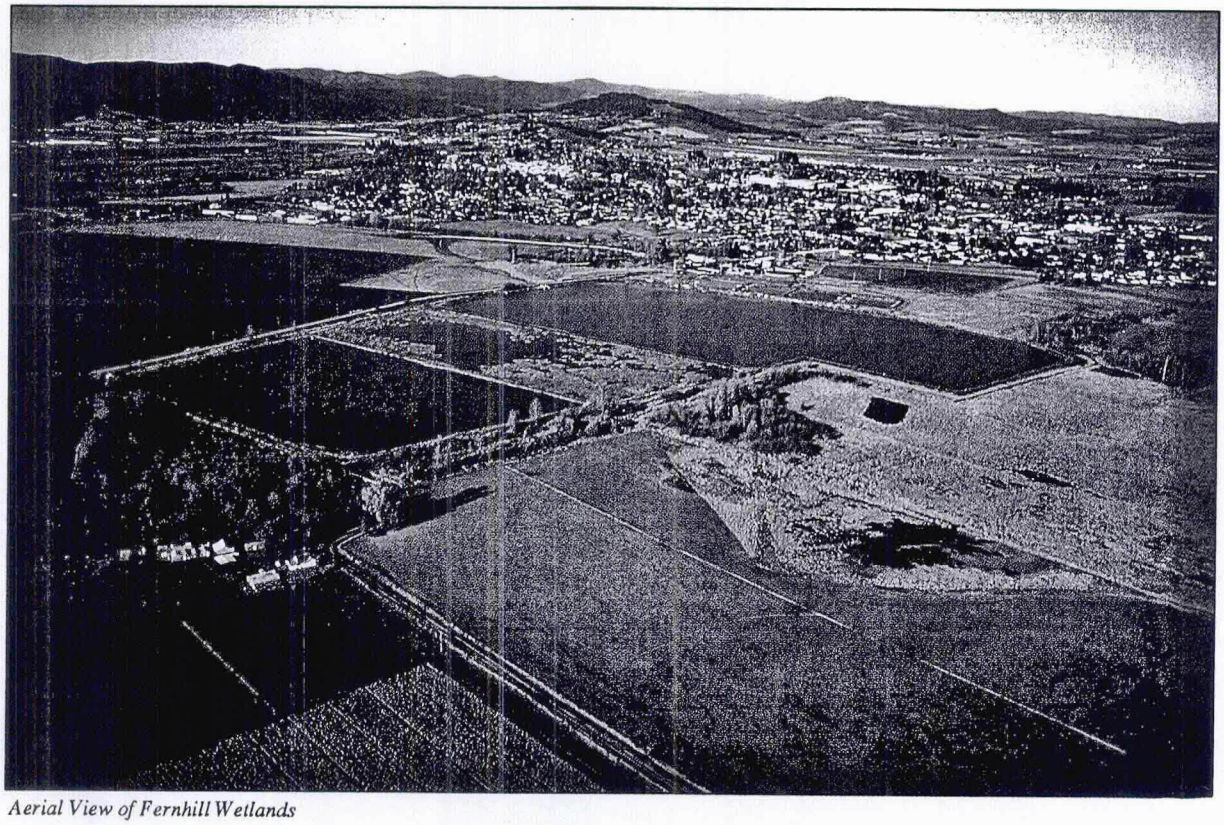


# INTRODUCTION

As a result of past land use practices and developmental pressures, wetlands throughout the country have been disappearing at an alarming rate. However, increased understanding has developed in recent years of the important natural resource and humanistic values provided by wetland systems. The benefits generated from preservation and enhancement of wetlands can be enormous; including improved water quality, provision of critical habitat for a variety of plants and animals, provision of recreational and educational opportunities, and the protection of valuable open spaces throughout the urban area.

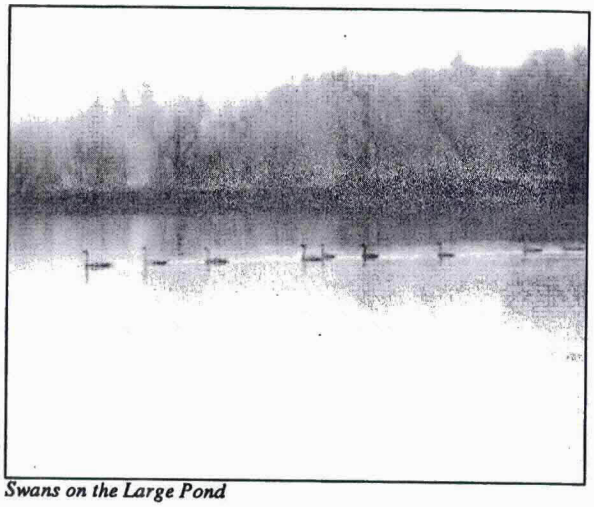
The Fernhill Wetland is located on the southerly edge of the city of Forest Grove and offers a unique opportunity for wetland and wildlife enhancement that will bring pride to the community and become a model for use in other areas. The wetland in this area consists of approximately 100 acres, 20 acres of which is presently managed by the Unified Sewerage Agency for water quality and wildlife enhancement. Fernhill's location at the apex between the Willamette and Yamhill flyways provides critical habitat to a great diversity of migratory birds and water fowl. The close proximity to urban areas also provides an excellent opportunity to educate the public about the role of wetlands in our environment and offers a premier site for viewing wetland dependant wildlife, while also providing a means for improving water quality for water entering the Tualatin River.

The Fernhill Wetland is a critical link in the chain of regional wetlands that provide habitat and forage for a host of migratory and wintering waterfowl as well as a variety of resident fish and wildlife. From late fall to early spring, thousands of geese, swans, ducks and other waterfowl flock to the area, providing the region with one of its finest and most well renowned bird viewing sites. The Metropolitan Service District recognized the unique value of this area in 1991 through a federal grant for wetland enhancement. Fernhill was one of 14 project areas to have been selected for the METRO Greenspaces Program.



*Aerial View of Fernhill Wetlands*

*Local Residents Admiring Passing Ducks*



***Swans on the Large Pond***

## COMMUNITY INVOLVEMENT

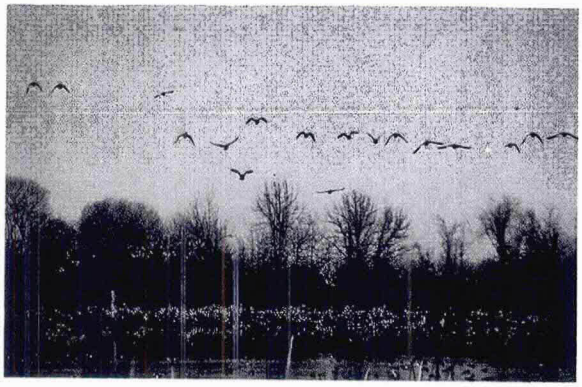
Citizen involvement in local issues is essential in developing a strong scense of pride in the community and creating a vision for the future. As the City of Forest Grove has grown over the past few years, residents have clearly begun to recognize the significant treasure that Fernhill Wetlands can provide to the community.

Numerous community groups have already taken an interest in becoming involved in the project, and the Fernhill Wetland Council is committed to increasing public exposure to the area. Community efforts currently underway include the following:

- The Council is in the process of preparing a signage program and informational brochures for disemination to schools and local organizations.
- Efforts have been initiated to promote a "Friends of Fernill Wetlands" organization that might aid in securing independent funding sources and volunteer laborers.
- The retired community has expressed interest in volunteering for planting and maintenance efforts.
- Pacific University in Forest Grove has expressed interest in using the wetlands as an outdoor laboratory for student research projects.
- The recent application nominating Forest Grove for an All-American City Award listed the Fernhill Wetlands as one of the city's major assests for building community pride and participation.

As the project is developed, many additional opportunities for community involvement and civic education will arise. The biological diversity of the site makes it ideally suited for use as an outdoor classroom for primary and secondary schools. Planting, trail construction and maintenance can be undertaken by citizen groups. As these community efforts work hand-in-hand with overall planning efforts, a comprehensive project can be created in which all participants receive a strong sense of pride and committment.

# EXECUTIVE SUMMARY



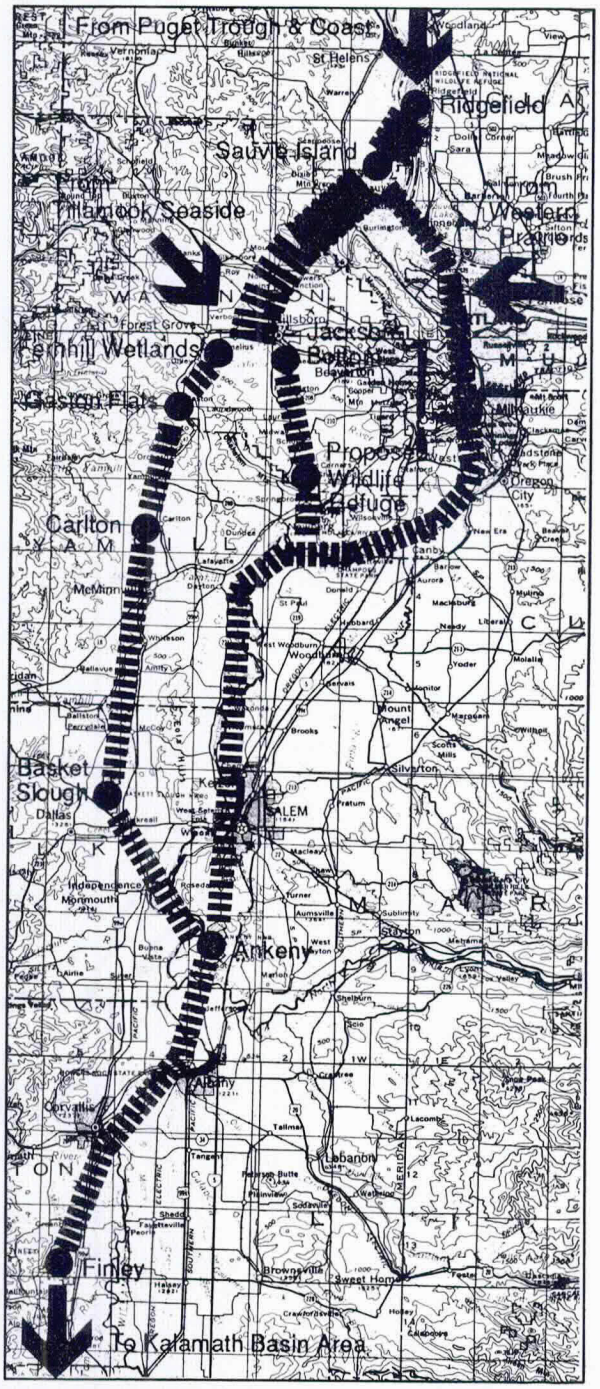
# EXECUTIVE SUMMARY

## VALUE OF THE MASTER PLAN

The Fernhill Wetlands Master Plan provides an exciting vision of the future which brings together diverse interest groups in a single effort to enhance the environment of the region. The master plan also provides a set of goals, objectives, and priorities for the community, offering direction to local citizens and service groups who wish to get involved. As the plan is developed and integrated into land use plans in the area, the benefits to wildlife and the community will multiply in a very positive manner.

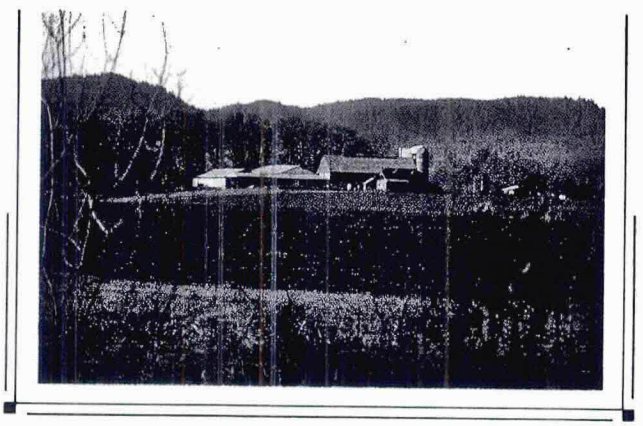
It is well recognized that wetlands are among the most productive natural ecosystems in the world. Protection and enhancement of these sensitive areas provides numerous benefits including: food and habitat for fish and wildlife, water quality improvement, flood protection, erosion control, opportunities for recreation and education, and aesthetic appreciation. In addition to providing all the aforementioned benefits, the Fernhill site also functions as an integral part of a complex system of wetlands that provide forage and resting sites for a diversity of migratory waterfowl passing through the region annually. As Fernhill is developed, it will become a pearl in the "Necklace" of regional wetlands and wildlife refuges that circle the Portland metropolitan area. They include the proposed Ridgefield National Wildlife Refuge, Sauvie Island, Fernhill, Jackson Bottom, Gaston Flats, Carlton, the proposed national wildlife refuge near Sherwood, Basket Slough, Ankeny and Finley. This regional significance provides not only benefits to the wildlife, but will also attract tourists and wildlife enthusiasts.

The preservation of these important open spaces also offers tremendous potential for enhancing the quality of life for future generations. As pressure on remaining tracts of undeveloped land increases, it becomes even more critical to protect the traditional rural and agricultural characteristics of this

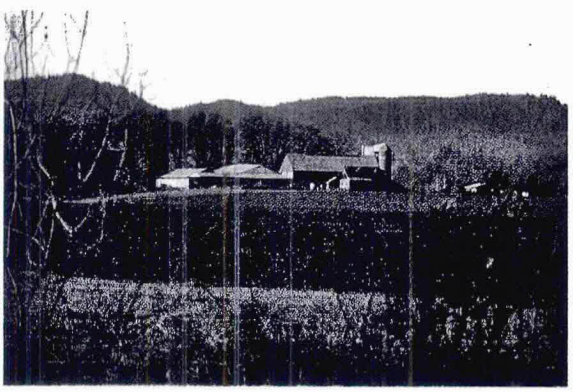



*Major Flyways Through the Region*

# AREA HISTORY



# AREA HISTORY



# AREA HISTORY

The present geological condition of the Tualatin River Valley stretch back to the end of the last ice age, nearly 11,000 years ago. At that time, a mammoth ice dam across western Montana collapsed under the incredible force of the melting glaciers. When the dam burst, thousands of square miles of water raged down the Columbia River system, inundating lowlands to the 500 foot elevation, including the Willamette and Tualatin Valleys. Vast amounts of sediment remained when the waters finally receded 4,200 years ago, creating a flat valley floor with deep, rich, soil.

## THE LAND

The central portion of the Tualatin Valley is nearly level and covered with deep sedimentary deposits, which reach a thickness of over 1,300 feet near the city of Hillsboro. The middle and lower stretches of the Tualatin River, now a sluggish waterway, cross this level plain. Due to its flat gradient and minimal current, the river's course, and hence the surrounding area, has changed very slowly over the centuries. Except for the undercutting of river banks and the ever-shifting oxbows resulting from occasional major floods, the valley has not been subjected to much downward erosion over the past 2,300 to 3,000 years.

This lack of downward erosion can be directly attributed to basalt formations which are located near the surface of the valley in several locations. The high erosional resistance of basalt means that the downward cutting power of the river has been effectively reduced. A basalt formation southeast of Fernhill Wetlands, between Laurel Ridge and Bull Mountain, has acted as a check-dam, slowing the rate of erosion and keeping the river gradient nearly flat along most of its length. The erosion that does occur is primarily due to the river meandering back and forth across the basalt base.

Because so little sediment has been carried out of the valley by the river system, it can be assumed that present topographic conditions have existed at least since the end of the last ice age. Indeed, the upper portions of the Tualatin Valley have actually gained in sediment. Younger alluvium soils have been carried down from the coast range, gradually building up the river bottoms. These soils, high in both organic materials and clays, are, in a sense, just passing through, carried as they are by successive winter floods. The consolidation of rich, slow draining soil, and constant replenishment, creates an ideal wetland environment throughout the central valley, including Fernhill Wetlands.

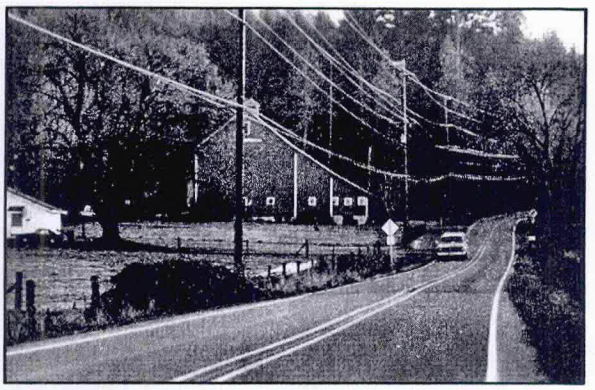
## EARLY INHABITANTS

Members of the Atfalati tribe of the Kalapuya linguistic group, are known early users of the land surrounding the Tualatin River. Evidence suggests that an earlier group of big game hunters roamed the region but were willing to cede it to the northward migrating Kalapuyas. With the falls at Oregon City blocking any large-scale salmon runs on the Willamette or its tributaries, perhaps the earlier inhabitants considered the region to have little value.

Yet, the Atfalati made good use of what was available, hunting small game and collecting plants such as camas, wapato, wild onion, seeds, and nuts. Additionally, they ranged widely across the region, travelling as far as Tillamook Bay and the Columbia River for salmon, though they remained centered at Wapato Lake just southwest of the Fernhill area.

The mainstays of the Atfalati diet were waterfowl, bulbs of the flower called camas, and tubers of an arrow-leaved water plant called wapato. Conjecture also holds that the Atfalati ate insects, i.e., grasshoppers, caterpillars, and yellow jacket larvae, although this assumption is based on the knowledge that other Kalapuya tribes did so. Nonetheless, the marsh would have been a prime habitat for such creatures.

*Historic Fernhill Farmhouse Bordering Site*



*Historic Barn*

## SETTLEMENT ERA

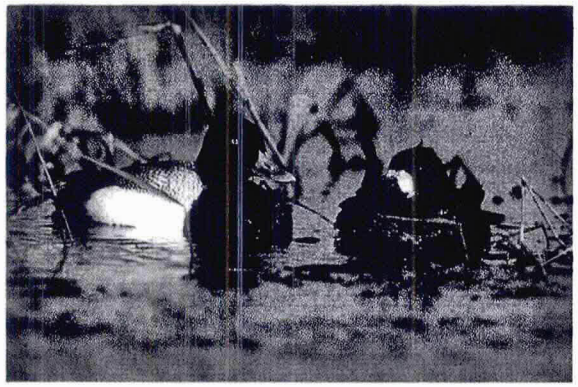
By the 1830's, a majority of the Atfalatis were dead, killed off by the same diseases which had swept the continent with the arrival of the Europeans; smallpox and malaria brought by the fur trappers took the largest toll. Virtually decimated, (and gone completely by 1838), the Atfalati left an agricultural treasure as their legacy: the broad fertile plains of the Tualatin Valley.

The first use of the Tualatin Valley by Caucasians was as summer pasture for the cattle of Fort Vancouver, presaging the agricultural value future settlers would place on the area. Soon after, retired trappers began to settle the valley and establish the makings of a permanent settlement. The first American settlers arrived in the 1840's.

The Eastern Tualatin Valley was one of the first areas settled in the Oregon territory after the Hudson Bay Company's Fort Vancouver. Under the system of Donation Land Claims (DLC's), a majority of the high quality agricultural lands were claimed by 1852. Split by the claims of three men, the Fernhill Wetlands area was considered of only minor usefulness. Most of these DLC's remained on the northern side of the valley. The Tualatin River floodplain, including Fernhill, hindered access to the south for several decades.

Among the early land claims in the Fernhill area were the homesteads of Alvin T. Smith, William Yates, Solomon Emerick, and William Geiger. The Smith DLC bordered the marsh on the west, while the Yates, Emerick and Geiger claims split the bulk of the marsh proper, according to the 1852 Donation Land Claim survey map.

# EXISTING CONDITIONS



# EXISTING CONDITIONS

## LOCATION

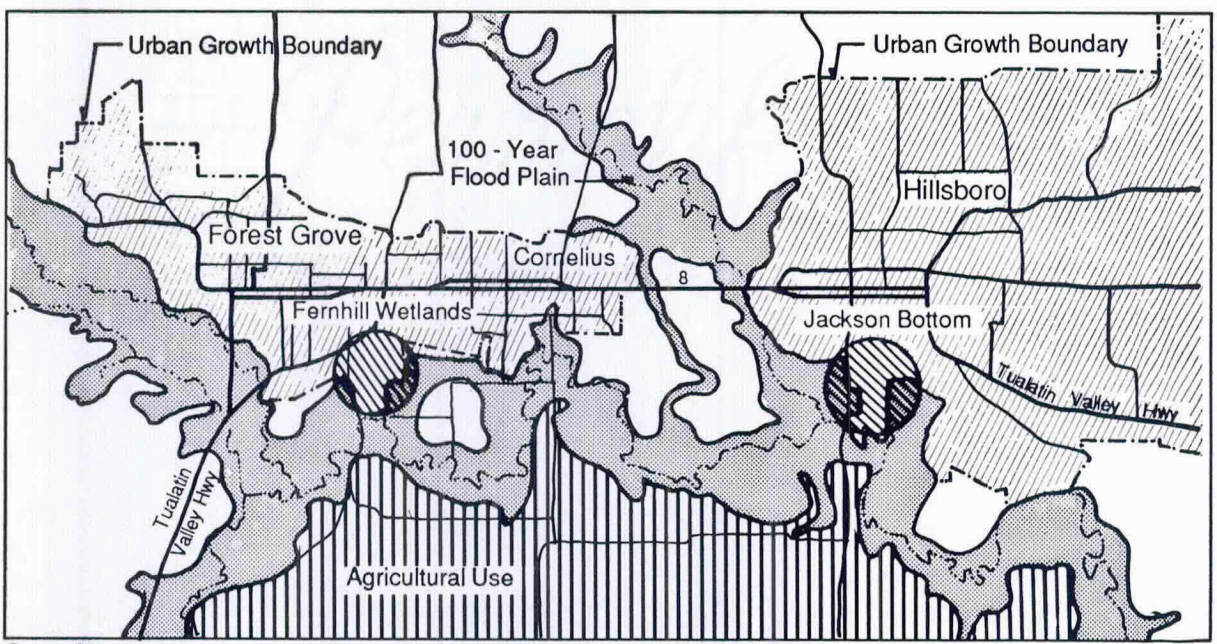
The Fernhill study area consists of 160 acres situated to the south of Highway 47 and to the southeast of the Forest Grove central business district. The site extends over one half mile west of Fernhill Road, eastward toward Lafollette Road and south to the Tualatin River. The northern boundary is formed by the Southern Pacific Railroad and the Tektronix campus.

## CLIMATE

This area experiences a mild marine climate due to prevailing winds from the Pacific Ocean, which greatly moderate the colder temperatures of winter and heat of summer. Rainfall is most pronounced during the winter with an annual precipitation of 40 inches. Plentiful moisture and moderate temperatures contribute to a long and fruitful growing season of 220 days.

## SITE CHARACTER AND VEGETATION

The Fernhill Wetland area is typical of the low-lying flatlands of the upper Tualatin River basin and is not unlike the vegetation communities found at Jackson Bottom a few miles to the east. The entire area, prior to the construction of the Forest Grove Wastewater Treatment plant in 1953, was given over to various sorts of agricultural uses including dairy farm pasture, truck gardening, grains, nuts and small fruits. Areas of excessive moisture were either drained or left unattended and subsequently were invaded by reed canary grass choking out less robust native sedges rushes and other emergent wetland species. The wastewater ponds provide large open water habitat for resident and migratory waterfowl and shore birds. The Unified Sewerage Agency is, however, permitting the control pond (middle pond) to revert back to an emergent wetland situation with its entire community of emergent vegetation. A complete inventory of this area has not yet been done but will be completed during the 1992 spring growing season.

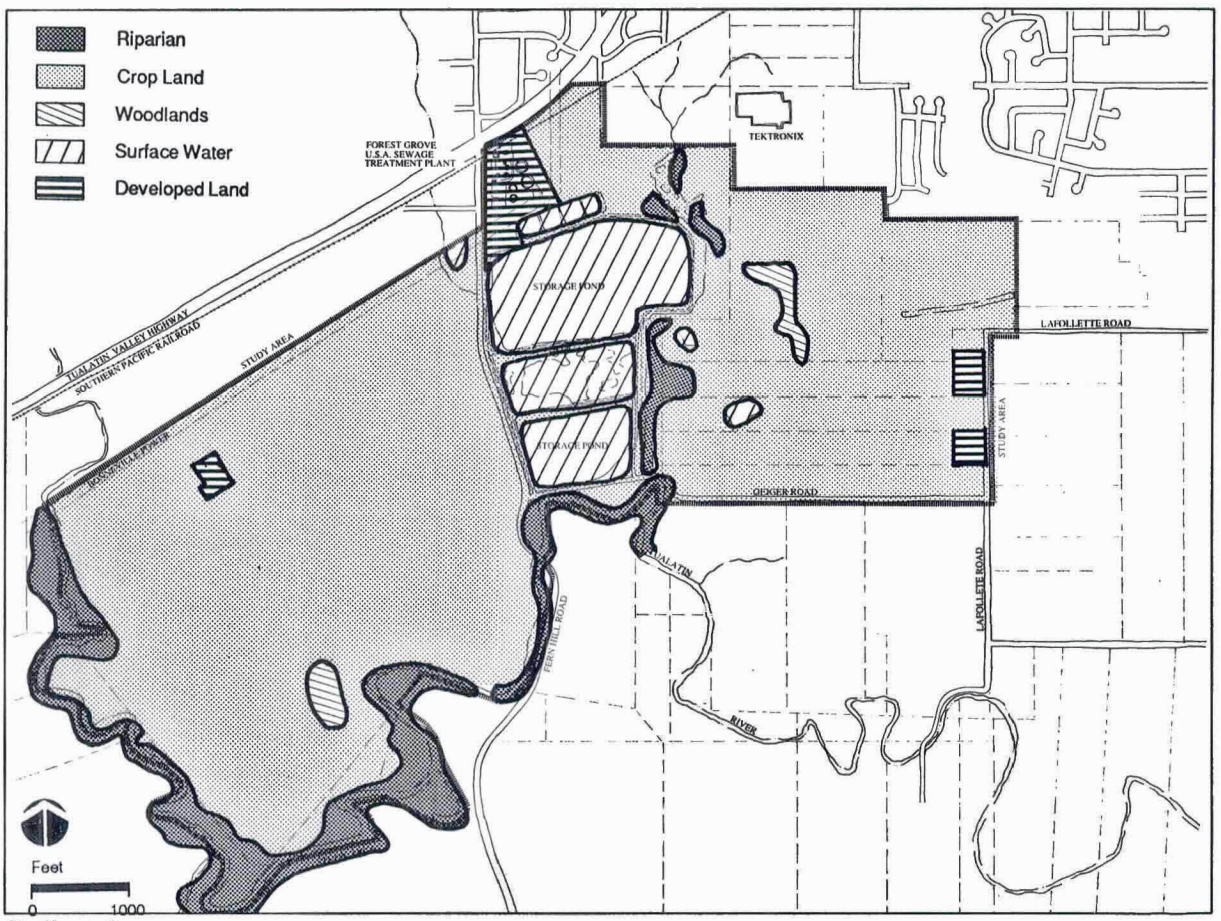



*Context Map*

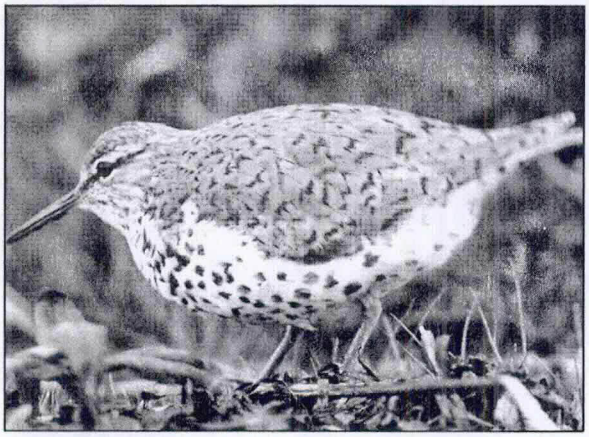
The triangular fill area between Geiger Road and the river south of the treatment ponds has been filled in years past and now contains teasel, Canadian thistle and other plants typical to disturbed sites. This triangular area is proposed for eventual public parking, river access and treatment pond observation blinds. A buffer strip of native vegetation will be planted between Geiger road and the parking area.

*Site for Proposed Parking*

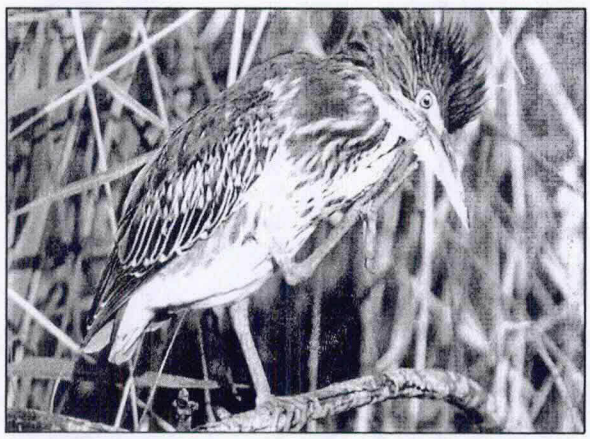
West of Fernhill Road the land is regularly used for agriculture except for an emergent wetland area in the northeast corner. This wetland was recently employed as a mitigation site for some wetland fill involved with the new Taylor Industrial Park. This mitigation work is small and involved the excavation of shallow ponds to provide more year-round open water habitat for resident waterfowl and wading birds.



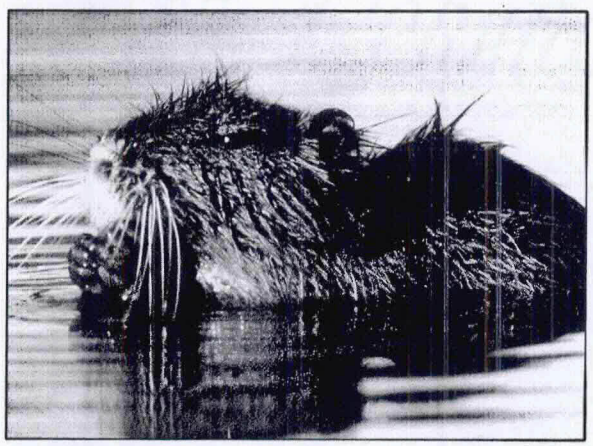

*Site Vegetation*



*Spotted Sandpiper*



*Green-Backed Heron*



*Nutria Taking a Swim*

excellent nest trees for great horned owls, hawks, and several species of songbirds. Deer, raccoon, squirrels, and coyotes commonly use these woodlots for food and cover.

Several fields in the area are irrigated with effluent and kept mowed. These provide habitat for several species of mice, voles, moles, and gophers. They provide excellent foraging areas for the large numbers of raptors in the area. Ring-necked pheasants are common where the fields are adjacent to the bushy weedlots.

Reed canary grass wetlands cover several acres east of the effluent lagoons. These lands provide good habitat for waterfowl in the winter and excellent escape cover for pheasants and songbirds. This habitat is also used by marsh wrens, and sora rails for nesting. High populations of mice and voles are also present. The greatest potential for enhancement is to provide diversity on these lands similar to the work that was done this fall on lands to the north.

## FISH

Fish species in the treatment ponds are dominated by large populations of carp. These provide an important food source for great blue herons, raccoons, coyotes, mink, turkey vultures, and bald eagles. The rest of the fisheries values for the Tualatin River would be identical to Jackson Bottom.

*On-Site Tributary Stream*

*Newly Constructed Emergent Marsh*

**Wetlands and Streams.** The study area is bounded by Gales Creek to the west and the Tualatin River to the south. A network of surface drainage ditches, subsurface drains, and creeks also flow through the site and ultimately discharge into the Tualatin River.

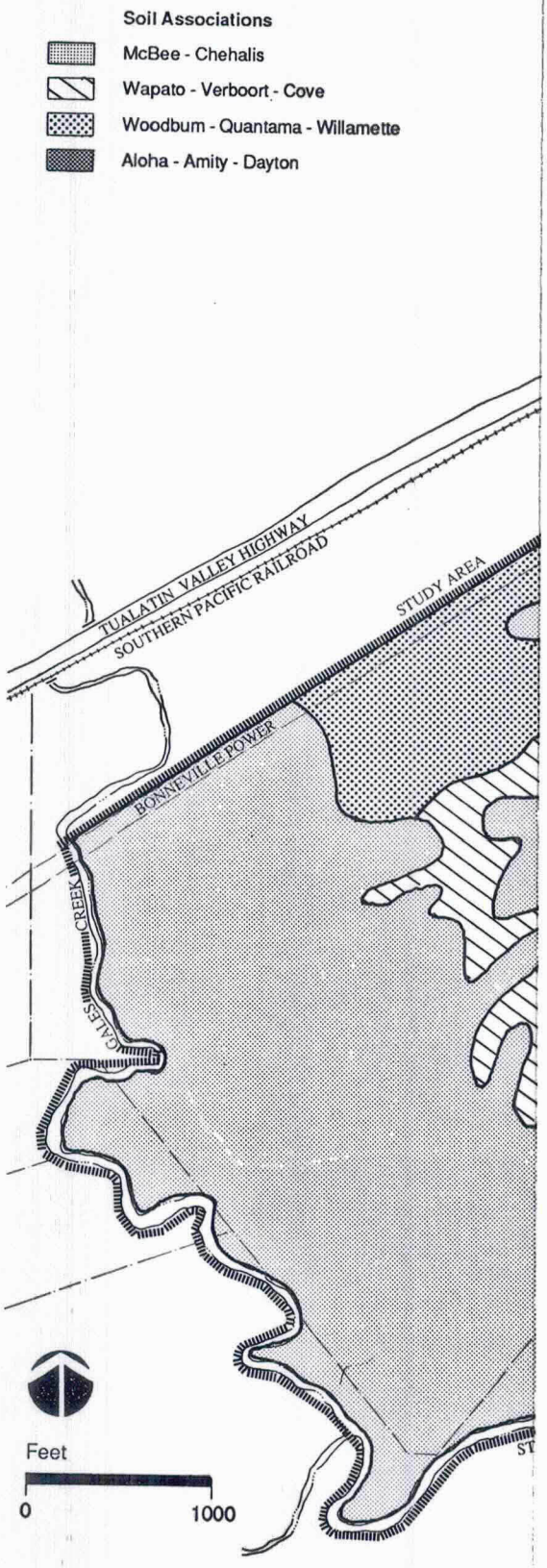
A natural tributary stream which carries much of the stormwater runoff from eastern Forest Grove enters the site from the north, just west of the Textronix campus, and flows along the east of the USA treatment ponds. As the stream nears the Tualatin River it broadens to form an emergent wetland. Additional natural wetlands lie to the east of the stream.

With the aid of a federal grant from the Metro Greenspaces Program, the Fernhill Wetlands Council is currently in the process of developing a 7 acre emergent marsh fed from the aforementioned tributary stream. The marsh edges are tapered at a 20:1 slope to create water levels from 3 inches to 3 feet. This allows for the establishment of a diversity of new aquatic plant such as cattails, bulrush and sedges.

**Groundwater.** The principal aquifers used in the region occur in the valley fill deposit and Columbia River Basalt. The highest ground water yields required for some municipal, irrigation or industrial wells are from aquifers in the Columbia River basalts. Wells completed in this formation are typically in areas where the thickness of overlying valley fill is 1,000 feet or less. Oregon Water Resources Department well logs show that the highest yields from wells completed in the valley fill in the Forest Grove-Hillsboro area come from sand beds and occasional gravel deposits that typically occur at depths of about 40, 100, 200 and 300 feet below the ground surface.

Groundwater in the valley fill deposits is predominantly unconfined. The water table fluctuates with the annual rainfall cycle. Fluctuations of 15 to 20 feet in the water level in wells are common. Principal recharge to the ground water in the basin is believed to be from infiltration of rainfall. Ground water is also recharged from treated wastewater land application, flood waters, and lateral inflow of water from adjoining uplands. Principal ground water discharge in the basin is in the form of springs or seeps and discharge to the Tualatin River and tributaries. Base flow in the Tualatin River is maintained even in drought years by a combination of ground water discharges and stored water releases from Scoggins Reservoir in the upper Tualatin River Basin.

# SOILS MAP


Soil Associations
McBee - Chehalis
Wapato - Verboort - Cove
Woodburn - Quantama - Willamette
Aloha - Amity - Dayton
TUALATIN VALLEY HIGHWAY
SOUTHERN PACIFIC RAILROAD
STUDY AREA
BONNEVILLE POWER
CEDAR MILLS CREEK
Feet
0
1000

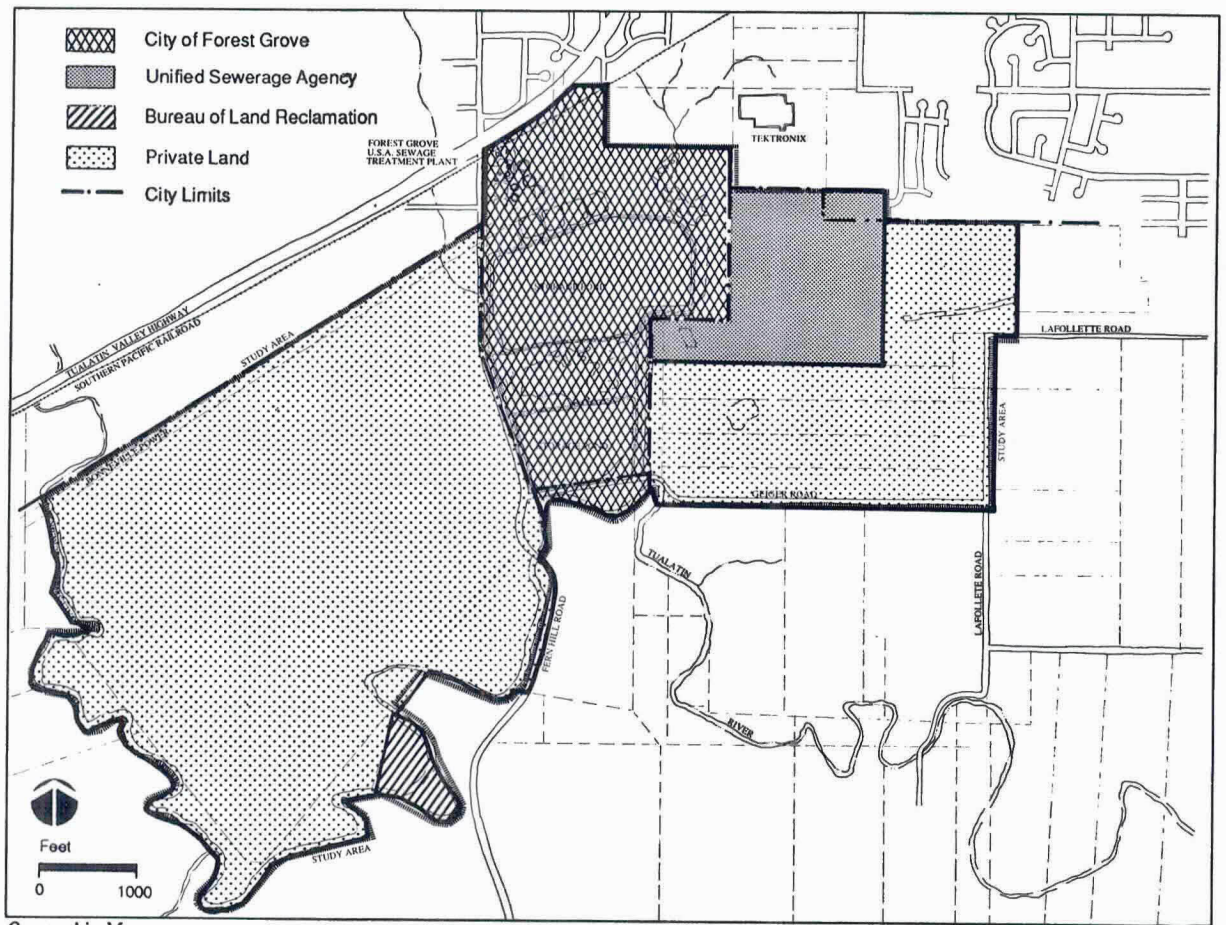
## OWNERSHIP

The core of the Fernhill Wetlands Study area includes an 190 acre tract of land jointly owned by the City of Forest Grove and the Unified Sewerage Agency. USA manages this parcel for wastewater treatment. Directly east and south of the USA property, is privately owned agricultural land, which contains both upland and wetland areas. The Fernhill Council would eventually like to acquire all, or a portion of, this property as part of their wetland enhancement and effluent treatment program.

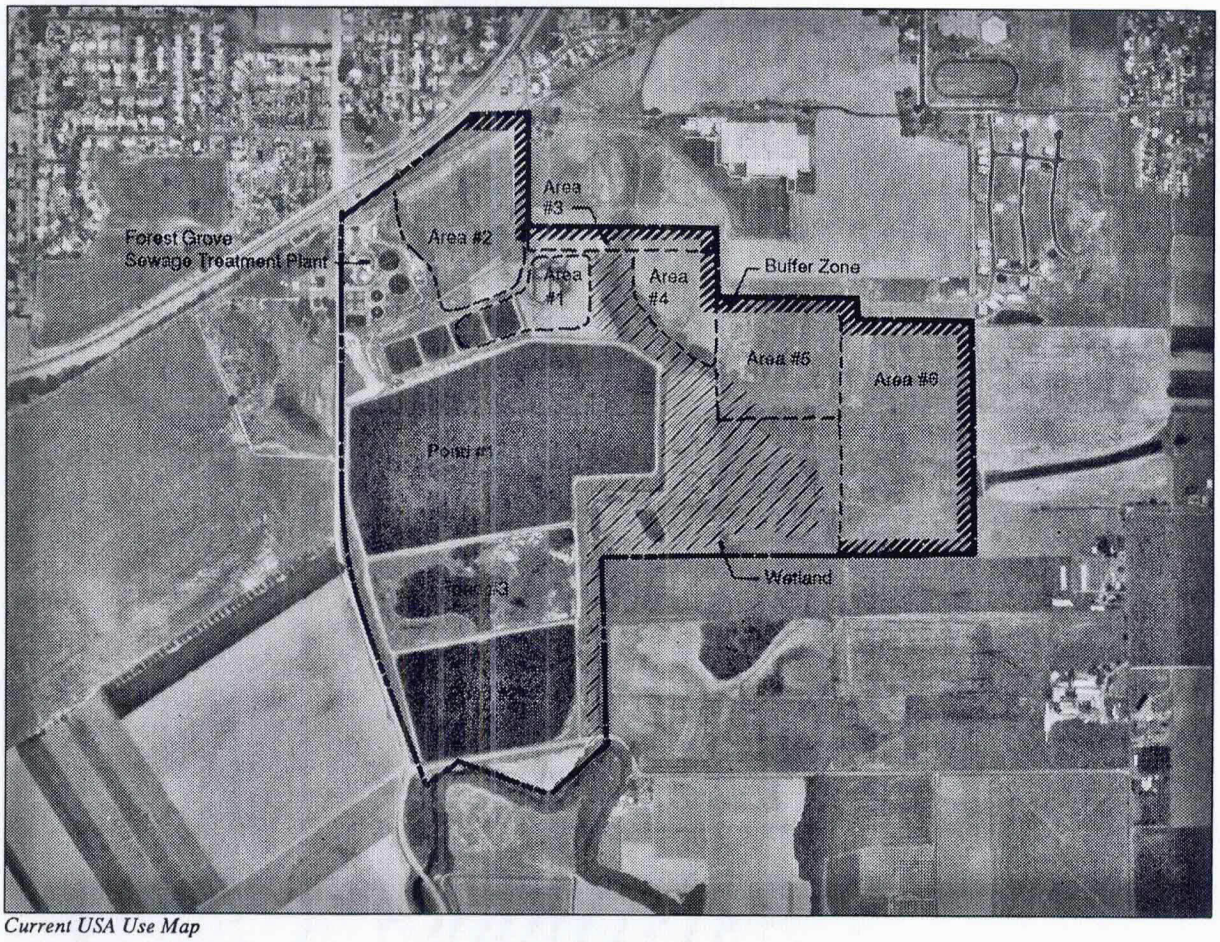
To the west of Fernhill Road lies a 406 acre tract of privately owned land utilized primarily for agricultural purposes. This parcel also contains some lowland acres that could be enhanced for wildlife attraction. USA is currently reviewing this property for purchase and use in its recycled wastewater program.

The study area is bordered by the City of Forest Grove and the Tektronix campus to the north and residential areas to the northeast. Agricultural lands surround the rest of the site.

The core of the study area falls within the jurisdiction of the City of Forest Grove and is zoned under the general industrial designation. The southern-




*Ownership Map*



*Current USA Use Map*

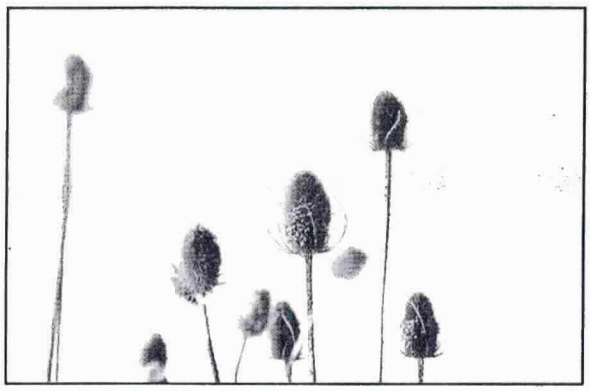
wildlife is provided with a forage crop. Poplars also absorb twice as much water as grasses and can be irrigated with drip irrigation, thus limiting buffer constraints to 10 feet. The trees can also be harvested after 2-5 years to provide sawdust or wood chips, which are a key component of sludge treatment. The planting of poplars in perimeter buffer zones has already begun, and USA is working with consultants to determine other suitable locations throughout the property.

**Existing Effluent Treatment Areas.** The land currently managed by USA is illustrated above. By the summer of 1993, USA plans on utilizing all irrigatable property as efficiently as possible. Presently, moving rollers are used to irrigate areas 4, 5 and 6, except for the 70' buffer along property lines. Only half of area 2 is currently irrigated. However, USA plans to expand irrigation to take in the rest of area 2 as well as areas 1 and 3. Drip irrigation is being experimented with in the buffer zones. Area 1 will be leveled out and then irrigated with big gun sprinkler heads. The southern portion of area 6 has been plowed and disked, and will be planted in corn.

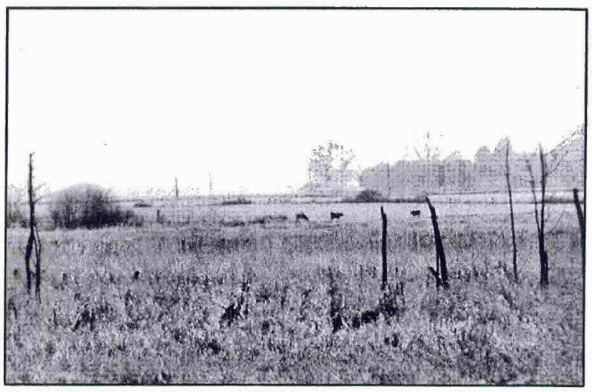
Three storage ponds exist on site. Ponds # 1 and 2 are scheduled to continue in present use as storage of treated wastewater, however, they will be dredged within two years, and the existing dikes will be raised by approximately 5 feet. Pond # 3 began silting in during the late 1970's and is now reverting back to a natural appearing wetland. This pond will remain undisturbed.

# MASTER PLAN

# MASTER PLAN



*Teasels Commonly Found on Site*



*Cattle Grazing on Irrigated Fields*

## INTENT

The intent of the concept master plan is to create a multi-purpose wetland system which serves to improve water quality for the Tualatin River while offering combined benefits of wildlife enhancement, recreational enjoyment, educational interpretation and improved quality of life for the present and future generations. The master plan also provides a framework for guiding and implementing future improvements and encouraging local support.

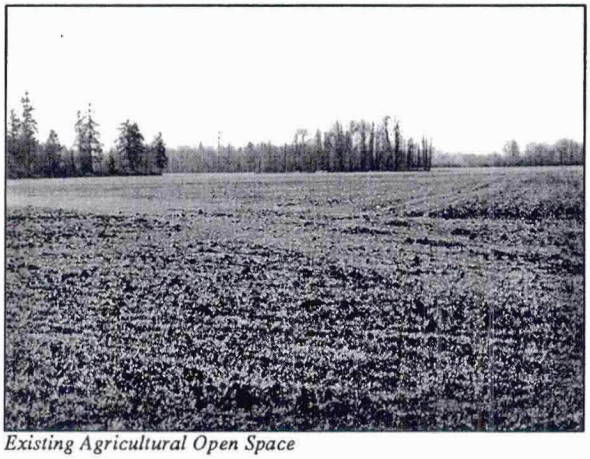
Due to similar site features and programmatic concerns, the master plan for Fernhill Wetlands is based on the model established for Jackson Bottom. However, individual components have been customized to address the unique features and location of the site.

## GOALS

**Improve Water Quality.** The proposed plan for water quality management will assist the Unified Sewerage Agency's Recycled Wastewater Plan by providing opportunities to use highly treated wastewater within the wetlands management area. The treated wastewater will be used for non-discharge constructed wetlands (providing additional wildlife habitat), restoration of agricultural wetlands, and irrigation of farm fields for commercial agriculture and wildlife feed. The areas for these uses include land immediately east and west of the existing wastewater treatment plant storage ponds. These types of uses will allow treated wastewater to receive additional filtration and purification through natural systems prior to release in the Tualatin River.

Urban surface water runoff quality improvements will also occur on the fringe of the Fernhill Wetlands. Development of storm water runoff treatment wetlands, north and west of the newly constructed wetlands will provide treatment of urban surface water runoff for a portion of southeast Forest Grove by filtering pollutants through grassy swales and ponds before the runoff enters the Tualatin River.

*On-Site Trails*



*Existing Agricultural Open Space*

**Provide Recreational and Educational Opportunities.** As wildlife diversity increases and a more complex wetland system is created, greater numbers of people will also be attracted to the Fernhill Wetlands. Use of the site for educational and recreational purposes will be encouraged through:

- Development of a system of looped trails and view points which allow exposure to wildlife yet minimize disturbance in critical wildlife areas.
- Development of a perimeter trail along the Tualatin River and Gales Creek as part of a regional greenway trail system.
- Development of information kiosks and interpretive signage along the trails calling attention to specific features of the site such as wildlife in the area, the water treatment process, and the role of hunters in supporting habitat.
- Construction of a permanent shelter/classroom facility for the convenience of participants in field trips.
- Encouragement of on-site research for students and researchers.
- Production of a brochure for distribution in schools, describing the site and its purposes.
- Creation of a slide show for schools and service clubs.
- Distribution of quarterly newsletter about activities and developments at the site.

**Preserve Rural and Agricultural Open Space.** The Tualatin Valley is characterized by broad flood plains and rich agricultural lands. The master plan proposes that the agricultural character of the site be maintained offering benefits of continued productivity, scenic value, wildlife enhancement, and the perpetual preservation of rural open space within close proximity to urban populations.

**Restored Agricultural Wetlands.** It is proposed to either enhance existing wetland areas, or restore historic wetlands on hydric soils through the use of flow control structures and by allowing irrigated recycled wastewater to flow into the low lying areas. The recycled wastewater will be polished by overland flow through grass and field crops irrigated near the wetlands. The flow control structure will be designed to maintain stable water levels in the wetlands. The depth of water will be according to the desired vegetation, wildlife use of the wetland, and amount of land desired to be inundated.

**Stormwater Treatment Ponds.** It is proposed that a pond or wetland be built to capture surface water runoff for treatment before the water reaches existing wetland areas. The pond will be located at the north border of the Fernhill Wetlands management area near Tektronix. The existing perennial "drainage ditch" should be redesigned to incorporate stormwater quality and quantity detention times necessary to polish the water. The pond should be shaped and vegetation planted to blend the pond into the surrounding landscape.

**Wildlife Habitat Enhancement.** The development of a complex wetland system containing deep open water, shallow ponds and emergent vegetation will enhance existing wildlife habitat and attract a greater diversity of fish and wildlife. These wetlands may contain treated wastewater, surface water, or shallow groundwater.

Ponds and wetlands will be constructed with variable edge and bottom configurations to increase shoreline conditions and water depths will increase habitat diversity and create "niches" that will be occupied in time by a wide range of plants and animals. In addition, small islands will be placed in many of the ponds to provide safe nesting and resting areas for waterfowl.

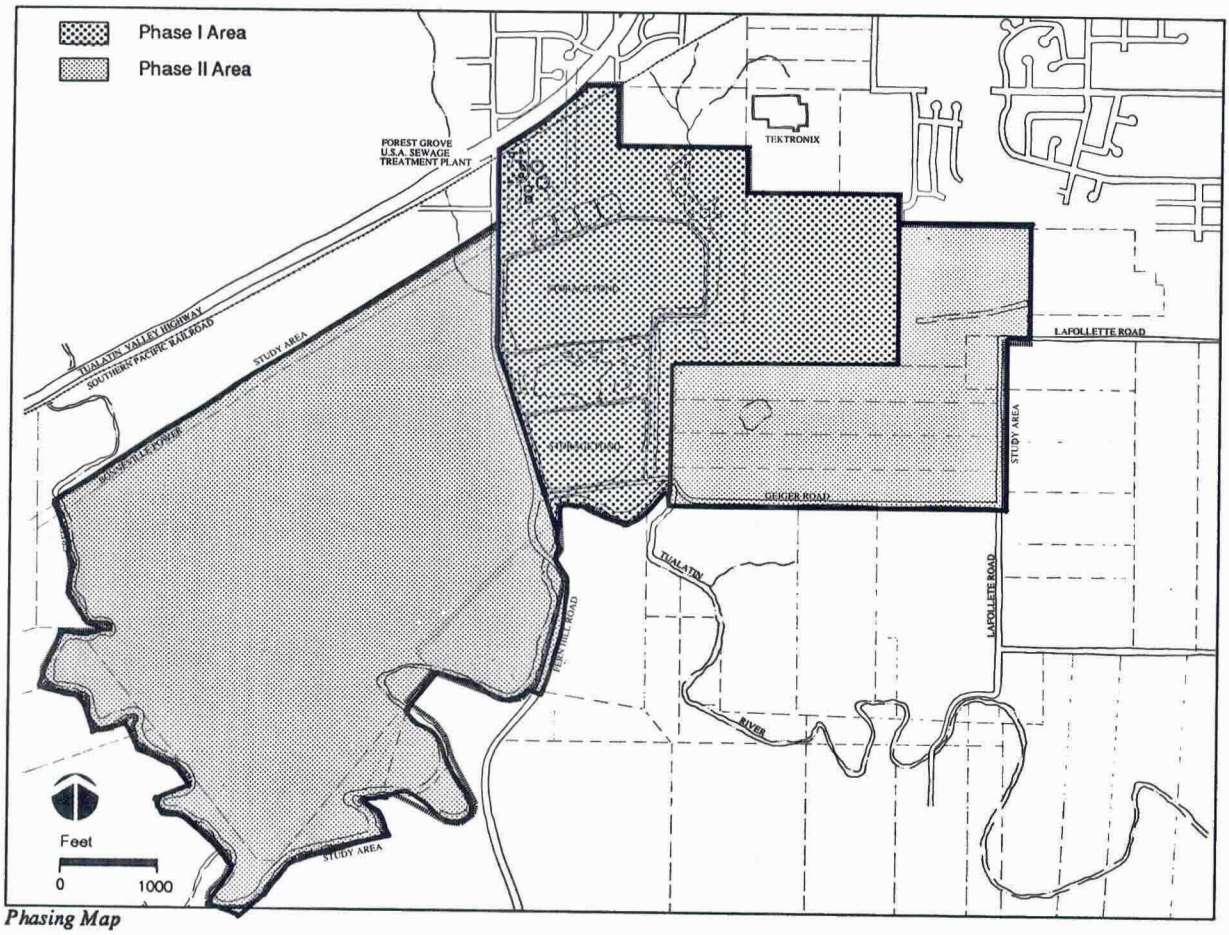
Areas between ponds will be planted in a variety of patterns to provide food and shelter for wildlife and encourage a more diverse wildlife population. Trees will be planted in some areas to produce a thick forest cover. In other areas, only a few trees will be planted for nesting areas and perches. Shrubs will be planted in selected areas to restore existing or create new "fence row" habitat for upland birds and wildlife and to provide a buffer between areas.

Perimeter buffer zones will be planted with poplars and edged with shrub species to provide a variety of niches for wildlife. Although the poplar groves will be irrigated, the planting can take on a informal configuration along the edges.

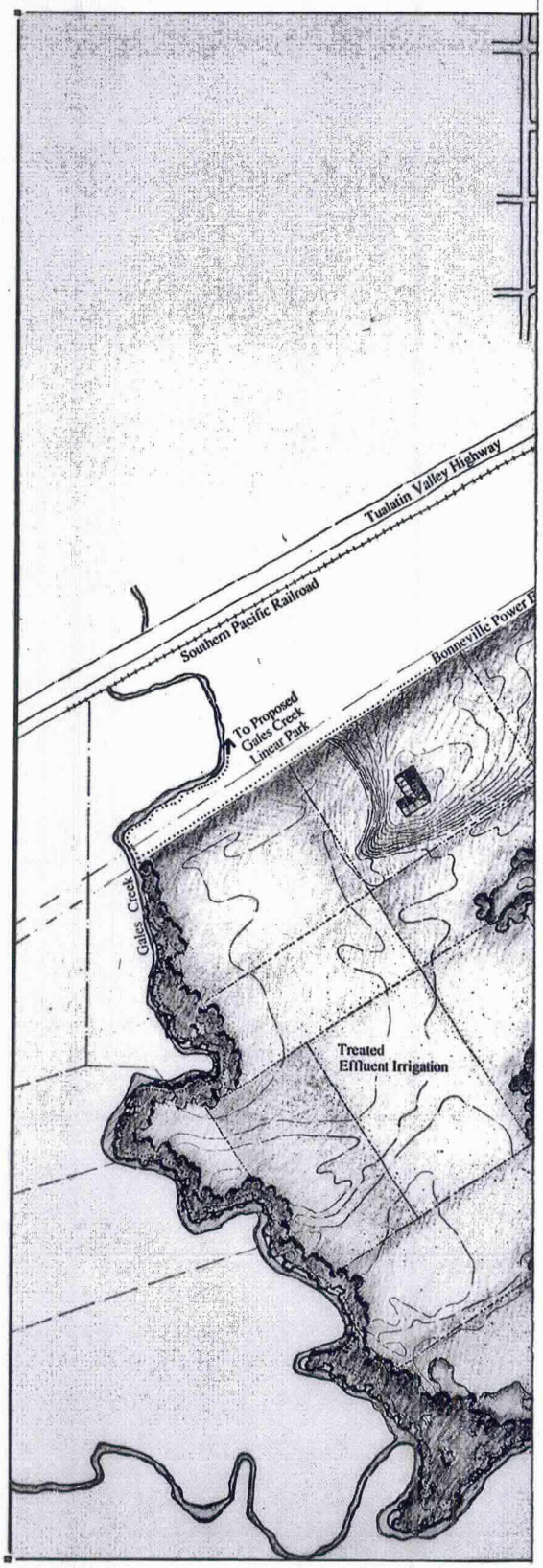
Additional wildlife enhancement measures proposed include the installation of nest boxes and structures around the effluent pond perimeter, and the periodic moving of irrigated areas to provide forage for selected areas.

**Trail System.** In order to minimize disturbance to wildlife and to USA treatment operations, public access will be limited to selected portions of the site. During the first phase of improvements, access will be controlled through scheduled tours guided by leaders knowledgeable of the unique features of the site.

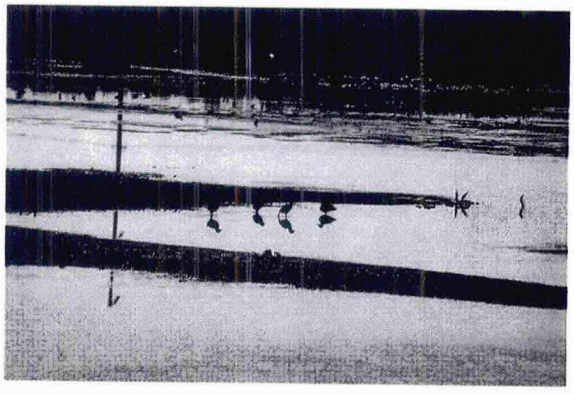
After impacts of increased public use have been monitored, the trail system will be refined and opened up to the public. This is planned to occur during Phase II. If private holdings are aquired to the west, the trail system will be expanded to include a perimeter bicycle and pedestrian path along the Tualatin River, Gales Creek and the Bonneville Power Easement. This will provide connection to a broader network of regional parks and open spaces.


Phase I Area
Phase II Area
FOREST GROVE
U.S.A. SEWAGE
TREATMENT PLANT
TEKTRONIX
TUALATIN VALLEY HIGHWAY
SOUTHERN PACIFIC RAILROAD
STUDY AREA
LAFOLLETTE ROAD
GEIGER ROAD
TUALATIN
RIVER
Feet
0
1000

*Phasing Map*


Tualatin Valley Highway
Southern Pacific Railroad
Bonneville Power
To Proposed
Gales Creek
Linear Park
Gales Creek
Treated
Effluent Irrigation

# APPENDICES



MEMORANDUM OF INTENT
FERN HILL WETLANDS PROJECT

## A. PARTIES

The parties to this Agreement are the Oregon Waterfowl and Wetlands Association, an Oregon nonprofit corporation, (OWWA); The Wetlands Conservancy, Inc., an Oregon nonprofit corporation, (TWC); and Unified Sewerage Agency, an Oregon county service district and municipal corporation (USA).

## B. STATEMENT OF PURPOSE

The parties desire to develop a project to be known as the Fern Hill Wetlands Project in or near Forest Grove, Oregon. The project shall consist of the establishment of multiple purpose wetlands and related facilities similar to the Jackson Bottom wetlands in and near Hillsboro. It appears to be feasible to the parties to develop available, suitable property in the vicinity of USA's Forest Grove treatment plant site for these wetlands. Exhibit "A" identifies the property initially identified by the parties as suitable.

The parties intend this document to be a statement of present intention and a commitment to cooperation in pursuit of common objectives. This agreement does not commit any party to take specific action or expend any funds except in accordance with applicable laws and its authority, budget, policy, and prodedures.

## C. BENEFITS OF THE PROJECT

Such development is expected to provide multiple benefits to the parties and the public, including enhanced wildlife habitat, water quality enhancement, water quantity management, public recreation and education. The project may also include waterfowl hunting by handicapped persons on a permit basis, and a structure adapted for such hunting and available to the public as a viewing area except during the waterfowl hunting season.

## D. THE PROJECT

The parties agree to do the following:

1. to seek funds to prepare a master concept plan for the project;

2. to participate in development of the plan, through provision of available information; participation of officers, employees, or members in technical or advisory bodies; contribution of available funds; and other activities

The parties have authorized to enter into this agreement pursuant to actions of their respective governing bodies.

DATED this 27th day of March, 1991.

OREGON WATERFOWL & WETLANDS ASSOCIATION

BY Larry W. Blankenship TITLE President

THE WETLANDS CONSERVANCY INC.

BY John W. Brown TITLE President

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY, OREGON

BY Gary F. Krahmer TITLE GENERAL MANAGER

GARY F. KRAHMER

APPROVED AS TO FORM:

BY Loretta Kendall TITLE Agency Counsel

# APPENDIX B

## Sources of Information

Cascade Earth Sciences, Ltd. Unified Sewerage Agency Forest Grove Waste Water Treatment Plant Potential Grounds Water and Surface Water Impacts from Effluent Reuse Practices.
February 4,1991

Scientific Resources Inc. Wetland Inventory Within the Forest Grove Urban Growth Planning Area.
August 1, 1991

United States Department of Agriculture Soil Conservation Service. Soil Survey of Washington County, Oregon
July, 1982