JACKSON-FRAZIER WETLAND MANAGEMENT PLAN

A Refinement of the 1992 Plan

Prepared for the
Benton County Natural Areas & Parks Department

by
Bob Frenkel,
Jackson-Frazier Wetland Technical Advisory Committee
&
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2005

When I first viewed Jackson-Frazier Wetland *one bright June day in 1978, I was overwhelmed by the profusion of seldom seen wetland plants, by the tangle of shrubs and vigorous ash trees. Here was a marvelous place with an improbable future. Development threatened. Later that fall, lying very ill in the hospital, I looked down from my high bed and saw again this wild island. How could an island of such wildness persist in such a densely populated urban setting?*

An opportunity and goal were born. Wouldn't it be splendid if this spectacular resource were available to the entire community? For the next 15 years, hundreds of county citizens worked hard toward achieving this goal and finally in 1993 Benton County established Jackson-Frazier Wetland for all to enjoy and be inspired by.

Over time, my perception of this wonderful wet landscape has broadened and deepened. Here, certainly, is a beautiful piece of wildness, a place to teach us about change and how ephemeral nature is, a place to get lost in, a changing fragment of the past, a living museum, classroom and laboratory, a peaceful place where one can take refuge from the hassles of everyday life and gain inspiration, and a place close to the settled landscape where one can celebrate and wonder about the diversity of the natural world.

—Bob Frenkel, January 16, 2003

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ACKNOWLEDGEMENTS

Preparation of this refined management plan was initiated in 1992 and has continued over many years and involved a wide range of people. Particular thanks are due to the 1992 Jackson-Frazier Wetland Task Force and especially to Janet Morlan, a principal author of the 1992 plan, upon which this refined plan is built. That older plan was straightforward, clear, and specified a realistic and very successful course of action for managing the wetland for more than 10 years. Now, as Jackson-Frazier Wetland faces new management challenges, the older plan needs revision.

This current plan revision could not have been prepared without help from the Benton County Natural Areas & Parks staff – people who were constantly called upon for advice and assistance and were always most obliging. These individuals included Al Kitzman, George McAdams, Mary Simpson, and Debbie Huntsman. In addition, Claire Fiegener, with Greenbelt Land Trust, provided many excellent comments and Doug Sackinger offered his GIS and cartographic skills in redrafting maps prepared earlier by Ellie Larsen, an AmeriCorps Volunteer with the Greenbelt Land Trust. Denise W. Ross generously allowed use of her hand colored images of the wetland. We also thank Janet Throop for the picture of Allen Throop.

Inspiration and constant guidance were unstintingly provided by Jerry Davis, Director of the Benton County Natural Areas & Parks Department, and by Phil Hays, Benton County Natural Areas & Parks Advisory Board Chair and liaison to the Jackson-Frazier Wetland Technical Advisory Committee.

Although the "Planning Team Consultants" are primarily responsible for compiling this refined plan, the plan is very much the product of the Jackson-Frazier Wetland Technical Advisory Committee members: Dave Butcher, Scott Craig, Gail O'Malley, and Loverna Wilson, who collectively stewed over how to revise and replace a very fine, but somewhat outdated, management plan and constantly interacted with the "planning team consultants."

Bob Frenkel
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Planning Team Consultants

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EXECUTIVE SUMMARY

The purpose of this plan is to provide a comprehensive policy framework for decisions regarding protection, restoration, and public use of the approximately 147-acre Jackson-Frazier Wetland a portion of which is managed by the Benton County Natural Areas & Parks Department. The first management plan for the wetland was prepared in 1992 by a citizen task force at the request of the Benton County Board of Commissioners. That initial plan was written in response to what was one of the first challenges to Oregon's land use planning requirements to protect "Goal 5: Significant Natural Resources." The 1992 management plan is formally part of the Benton Comprehensive Plan, and, likewise, this revision should become part of the updated Comprehensive Plan.

Accomplishments made in response to the 1992 plan are numerous and wide-ranging: construction of a 2/3-mile boardwalk, two bridges, and educational displays; acquisition of additional wetland acreage; a wide range of research activities; development of a strong volunteer base; increased public involvement; partnering with adjacent landowners; and a recent agreement with the U.S. Fish and Wildlife Service to participate in the Oregon Partners for Fish and Wildlife Program for assistance with the County's restoration efforts.

Refinement of the *1992 Jackson-Frazier Wetland Management Plan* builds on the legacy of achievements, considers future management challenges and opportunities, and establishes a clear vision and mission for the site. With this framework, the plan poses a variety of management options, analyzes opportunities and constraints, and describes management policies and implementation measures.

The intent of this refinement plan is to focus more on a policy framework than was the case with the 1992 plan. This revised plan provides action recommendations and guidance from which specific management practices can be developed. As in the 1992 plan, this updated plan addresses the external environment that is shaping the future of Jackson-Frazier Wetland, including the delicate relationship between urban development in the watershed and its impact on wetland hydrology and resources.

Finally, this plan emphasizes an outstanding opportunity to demonstrate wetland restoration concepts and methods and thus is a significant contribution to the growing body of knowledge about natural area management and restoration.

Vision and Mission for Jackson-Frazier Wetland

The vision for the wetland describes its preferred future, while the mission outlines specific goals for fulfilling the vision that links the historic to the future landscape.

Jackson-Frazier Wetland Vision

Jackson-Frazier Wetland is a fragment of the Willamette Valley's varied natural and human heritage, altered through two centuries of changing land use. The site is valued for its biodiversity consisting of a mosaic of native wetland prairie, mixed wetland forest-shrub habitat, a narrow band of riparian ash forest, and includes small populations of three plant species that are federally listed as endangered or threatened.

Jackson-Frazier Wetland will be protected, restored, and managed as a model project, demonstrating and testing natural area management implementation and methods. Jackson-Frazier Wetland will be an accessible place for people to be inspired and to wonder, and a quiet refuge for solace. The wetland will serve for people to learn about vegetation succession and natural processes. As time progresses, Jackson-Frazier will increasingly contrast with the surrounding densely settled and built landscape, all the while itself changing in response to altered climate, water flow, management, restoration, and neighboring development.

In the future, Jackson-Frazier Wetland will exhibit increased connectivity to its watershed by an open space corridor, including a public trail and a network of riparian strips and streams.

Jackson-Frazier Wetland (photography by Denise W. Ross)

Jackson-Frazier Wetland Mission

As a Benton County natural area, the mission of Jackson-Frazier Wetland is to protect and restore the wetland and its diverse plant communities, and to provide the public with a resource for passive recreational and educational use and for research opportunities focused on the following goals:

- The wetland will serve as a model for natural area protection, restoration, and management, including research, application of different management implementation, experimentation, and monitoring.
- Preferred public use will consist of nature-oriented activities, including walking, nature study, bird watching, and photography
- Opportunities will be available for classroom study and less formal learning about wetland processes, characteristics, functions, and values.
- Opportunities for volunteers will continue by engaging the community in hands-on management activities.
- Connectivity will be promoted with the regional landscape.

Jackson-Frazier Wetland (photography by Denise W. Ross)

Policy Framework

As a basis for policies guiding future management of Jackson-Frazer Wetland, an analysis was conducted of the environmental characteristics and opportunities and constraints of the site. From this analysis, key management issues were identified, a range of management options considered, and a preferred management approach selected.

Management Issues

Almost 40 management issues were identified for the wetland and are organized into major categories: general management, protection, public uses, connectivity, restoration, vegetation management, hydrological management, and off-site considerations. Some of these issues are considered to be critical issues for future management of the wetland.

Key Management Issues for Jackson-Frazier Wetland

- Maintaining wetland hydrology in an urbanizing environment
- Targeting restoration activities
- Managing rare plants and animals
- Controlling invasive plants
- Maintaining relationships with off-site landowners
- Encouraging appropriate public use
- Developing off-site connectivity

Preferred Management Concept

With input from the public and department staff, the Technical Advisory Committee examined a range of management options: (1) maintaining the status quo, (2) maximizing biodiversity, and (3) maintaining as much of the wetland area as possible as wetland prairie. The Committee favored an ***integrated management option,*** meaning that Jackson-Frazier Wetland will be managed using a variety of methods and levels of intensity. These will be adapted to different ecological characteristics of the wetland taking into consideration feasibility. To implement this strategy, the wetland was classified into five Management Units according to their inherent ecosystem conditions as well as the uses most suited to each unit. Under this framework, for example, public use is preferred in association with the boardwalk, and research activities are tightly controlled and undertaken by permit away from the boardwalk.

Management Policies and Implementation

Based on findings from a review and analysis of the 1992 plan, including evaluation of past management activities, key management issues, and agreement with the vision and mission, 11 management policies were developed that will guide future stewardship of the Jackson-Frazier Wetland:

Policy 1: PROTECTION

The overriding goal for management of Jackson-Frazier Wetland is to protect the natural area as a wetland typical of the historic Willamette Valley.

Policy 2: RESTORATION

Where technically and economically feasible, restore damaged wetland resources to a historically documented state prevailing at Euro-American settlement time using the least intrusive methods available and serving as a model project.

Policy 3: MANAGEMENT

Apply an integrated management approach to the site individually targeted to each management unit, using a variety of methods adjusted to the varying ecological characteristics, goals, and needs of each unit.

Policy 4: PERSONAL WELL-BEING

Consistent with other public uses, manage Jackson-Frazier Wetland to provide a sense of well-being, safety, privacy, solace, and aesthetic satisfaction.

Policy 5: RECREATION

Consistent with resource protection and other public uses, Jackson-Frazier Wetland shall be managed to provide for passive recreation activities available to everyone.

Policy 6: EDUCATION

Consistent with resource protection and other public uses, Jackson-Frazier Wetland shall be managed to provide for informal public and school-based education and professional training.

Policy 7: RESEARCH

Consistent with resource protection and other public uses, Jackson-Frazier Wetland shall be managed to allow for non-destructive research.

Policy 8: CONNECTIVITY

Encourage the surrounding community to maintain a conservation approach for wetland management to achieve hydrological, riparian and trail connections in the Jackson and Frazier watershed.

Policy 9: OFF-SITE PARTNERING

Collaborate with adjacent property owners, including the City of Corvallis, Greenbelt Land Trust, Good Samaritan Hospital, and others to achieve a watershed and viewshed approach to wetland and landscape management.

Policy 10: VOLUNTEERS

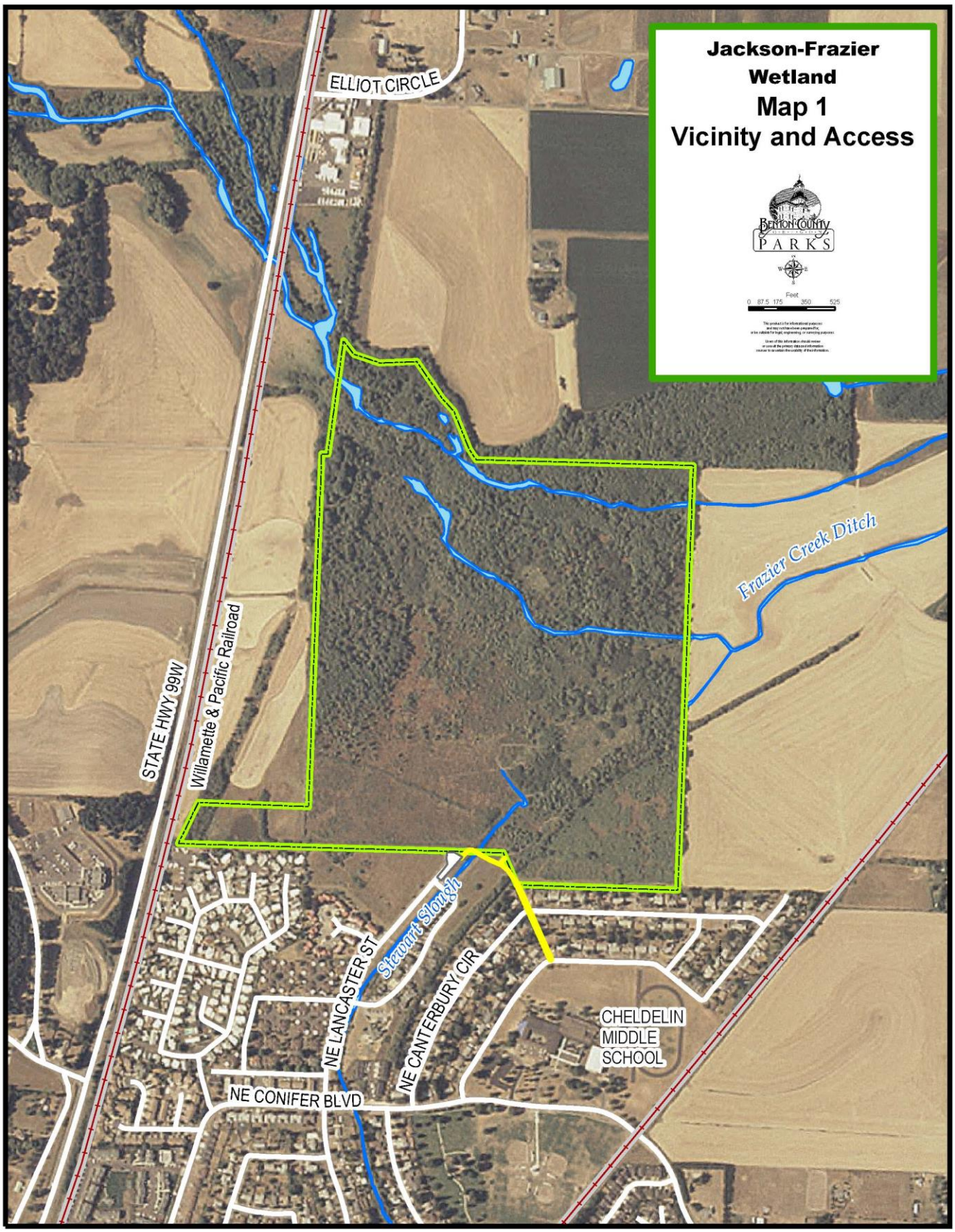
Engage the public in hands-on projects to maintain support and awareness of the benefits of Jackson-Frazier Wetland including education, research, and community wellness.

Policy 11: ACQUISITION

As contiguous or nearby qualifying land becomes available from a willing owner, Benton County may incorporate and protect the land as part of Jackson-Frazier Wetland.

Policy Implementation

Implementation bridges the management policies to on-site management. Implementation measures are protocols that provide guidance for policy implementation, and these range from action-oriented work plans to informal guidance. For example, Policy 4, concerned with a sense of well-being, calls for careful attention to a visitor's sense of security and aesthetic satisfaction when walking the boardwalk at Jackson-Frazier Wetland. A corresponding implementation measure is a protocol that provides guidance for removal and disposal of vegetation close to the boardwalk. This protocol has been developed by County staff and appears in Appendix 10, Jackson-Frazier Wetland Vegetation Debris Removal Procedures. A total of 24 implementation measures are presented in Chapter 5. The implementation measures are elaborated in greater detail in the appendices.


Jackson-Frazier
Wetland
Map 1
Vicinity and Access
Benton County
PARKS
Feet
0 87.5 175 350 525
ELLIOT CIRCLE
STATE HWY 99W
Willamette & Pacific Railroad
Frazier Creek Ditch
Stewart Slough
NE LANCASTER ST
NE CANTERBURY CIR
NE CONIFER BLVD
CHELDELIN
MIDDLE
SCHOOL

CHAPTER 1
PURPOSE & BACKGROUND

Revised Plan Context and Purpose

Benton County Board of Commissioners initially established Jackson-Frazier Wetland as a 131-acre county park unit on December 2, 1992 and commenced park management the following February with appointment of the Jackson-Frazier Wetland Technical Advisory Committee. This committee was formed to assist the Benton Country Board of Commissioners and the Parks Director with implementation of the Jackson-Frazier Wetland Management Plan, which had been prepared by a County citizen's task force and was accepted by the Benton County Commissioners on November 20, 1992. This document revises the 1992 plan for the purpose of providing a comprehensive policy framework to guide future decisions regarding protection, restoration, and public use of Jackson-Frazier Wetland.

The 1992 management plan provided the County with sound guidance during the first decade following establishment of Jackson-Frazier Wetland. Now, as the County continues to manage the wetland, there is an acute need to revise the plan to address new issues such as restoration, cooperation with the City of Corvallis Parks and Recreation Department, and cooperation with adjacent new landowners. Specifically, the new plan's objectives are to:

- provide policies and associated implementation recommendation guiding public use of the wetland for education, recreation, and research without damaging the resources
- identify acceptable and feasible management practices for restoration
- direct Benton County's relationship with neighboring property owners in protecting resources upon which Jackson-Frazier Wetland is dependent
- coordinate with the City of Corvallis and public groups in furthering a comprehensive parks and open space network

Accomplishments Since 1992

Since acceptance of the citizen's management plan in 1992, the Benton County Natural Areas & Parks Department and the newly appointed Technical Advisory Committee accomplished the following:

- Initiated protection of wetland as a natural area managed by Benton County
- Developed a facilities plan
- Constructed two wooden pedestrian bridges providing site access
- Built an informational kiosk
- Fenced the Bradshaw lomatium population for protection
- Constructed a 3,400-foot long boardwalk
- Erected five benches along the boardwalk
- Initiated an educational program consisting of permanent informational panels and brochures and encouraged use of the wetland as an outdoor classroom
- Raised more than $150,000 in external funding and in-kind assistance for all facilities
- Acquired 13.68 acres of adjacent wetland property
- Cooperated with adjacent private and public groups in achieving plan objectives

- Encouraged university and other researchers in numerous projects
- Initiated testing and evaluation of alternative restoration methods including mowing lomatium and reed canarygrass.
- Entered into an agreement with the U.S. Fish and Wildlife Service to participate in the Oregon Partners for Fish and Wildlife Program, with emphasis on restoring federally listed plant species and wetland resources.

Site and Land Use History

Protection of Jackson-Frazier Wetland is particularly significant not just because it was unprotected agricultural land threatened by urban development, but also because the wetland was one of the first land use issues to have the new statewide land use goals and policies rigorously applied to a local comprehensive land use plan.

The entire Jackson-Frazier Wetland is a 147-acre, relatively natural tract located immediately north of the Corvallis city limits at the north end of Lancaster Street, east of Highway 99W (Map 1). After an extended land use controversy, Benton County assumed ownership of a portion of the wetland and some adjacent non-wetland on October 22, 1990 through tax foreclosure of a 131-acre parcel. The 10-year land use controversy leading to park acquisition is described below. Site characteristics and land use constraints are further documented in the "Revised Economic, Social, Environmental, and Energy Analysis of Jackson-Frazier Wetland" (Benton County Development Department 1991) (see Appendix 1).

In the 1830s, the Jackson-Frazier tract was part of a vast wet prairie maintained by frequent Native American burning (Boyd 1986). The Kalapuya Tribe, which occupied the central Willamette Valley, subsisted mainly on plant foods including tarweed and grass seeds as well as camas and onion bulbs, foods favored by periodic burning. By the 1850s, the Native American population had been severely decimated, principally by introduced diseases, and the land became incorporated into a farm in 1849 (William Knotts, DLC 45). In 1869, the SE 1/4 section of the Knotts Claim was deeded to the Keeses, William Knotts' widow's second family (City of Corvallis 2003). Later, the land passed to John Sylvester who, in 1875, sold the property embracing the present wetland to Earnest Fisher. Ownership then passed to the Ireland family in the 1940s and then later to T. J. Starker in 1969 before passing to the Marshall Land Co. in 1984

Apparently, through all these ownerships the wetland was never planted or intensively farmed because of poorly drained, heavy soils; nonetheless, the area was harvested for "rough" native hay and heavily grazed until the early 1960s. Waterfowl were hunted in the parcel and two shallow duck ponds created in the 1930s. Prior to the 1920s, the wetland drained northeast by what has become known as Frazier Creek Ditch. Originally, there was no well-developed drainage to the south. That changed in the 1930s when a major ditch connecting southward to Stewart Slough was excavated, providing the wetland with the two drainages existing today.

In the late 1960s and early 1970s, most Oregon counties began to critically examine their lands and zone them for forest, agriculture, residential, and other land uses. With the advent of statewide planning in 1973 after passage of Senate Bill 100, cities and counties were required to establish urban growth boundaries and prepare comprehensive plans addressing Statewide Planning Goals. Plans were reviewed by the Department of Land Conservation and Development (DLCD) staff prior to presentation to the Land Conservation and Development Commission (LCDC) for approval. This

was not a trivial process. Frequently it took several years for a city or county to pass muster. Throughout the process, public participation was required.

In the 1960s, Jackson-Frazier wetland ownership passed to a speculative owner, grazing stopped, and the owner unsuccessfully petitioned the County to zone the property for industrial use. Initially the land was zoned Urban Residential (UR -1), rezoned in 1974 to Urban Residential (UR-3), rezoned again for Exclusive Farm Use (EFU) in 1979, and removed from the City planning area because of revised population projections. By the late 1970s, the County Comprehensive Plan was under preparation.

For the Comprehensive Plan, Benton County was required to address Goal 5, which was concerned with protecting natural resources such as wetlands, natural areas, wildlife corridors, etc. Under this goal, counties and cities had to inventory and evaluate the land and its resources, and if the resources were significant, develop a program of conservation or protection. The key study in this process was an Economic, Social, Environmental, and Energy (ESEE) analysis. After considerable public debate, the County approved a Goal 5 Task Force plan in 1982 to protect 14 acres of Jackson-Frazier Wetland from conflicting uses. The LCDC rejected this proposal.

In July 1982, the Marshall Land Company, which held an option to develop the property, filed a request with the County *and* City for a zone change and comprehensive plan amendment to place the wetland within the City boundary. Following a joint hearing, the request was postponed indefinitely because of insufficient information. Meanwhile, the County continued to work with the Goal 5 process. In September 1985, the County placed on the ballot a referendum for a tax levy to acquire the wetland. The referendum was defeated. The County then considered (with the DLCD's help) several ways of protecting the property: (1) indirect protection by limiting agricultural practices, (2) changing the Urban Growth Boundary, (3) acquiring the property using transferable development rights, and (4) other means. Each of these solutions was found to be impracticable.

Benton County resubmitted a new Goal 5 program for protection to the LCDC, relying on EFU (agricultural) zoning and Division State Lands (DSL) and Army Corps wetland regulations as sufficient to prevent negative impacts to the wetland. Although LCDC accepted this program, the Portland Audubon Society and others successfully challenged the decision in the Court of Appeals (*Audubon Society of Portland* vs. *LCDC*, CA AA439221). The Court remanded the issue to the County because the County relied on regulation and EFU zoning as effective mechanisms for protection, rather than to protect outright.

Wetland ownership passed to the Marshall Land Company in June 1984. In November 1985, the owner cleared by scraping approximately 13 acres of the property and deepened several ditches without appropriate permits from the County, state, or federal government. After an impact analysis was conducted for the DSL (Scientific Resources Inc. 1986), the DSL served the owner with a Restoration Order. Some time after 1986, the principal owner moved away from the area without paying property taxes; however, Benton County was still required, under LCDC order, to protect the Goal 5 resource and the "segmented" County Comprehensive Plan remained in non-compliance.

Finally on October 22, 1990, Benton County foreclosed on the wetland owner for failure to pay taxes and Benton County assumed title. County Community Development Department then revised the ESEE analysis and rezoned 131 acres as Open Space, and placed the entire delineated 147-acre wetland in a Wetland Overlay Zone in February 1991. These steps completed the LCDC obligation to protect the wetland and fulfilled Oregon's land use program requirements.

Relation to Land Use Planning Requirements

By establishing Jackson-Frazier Wetland as a protected wetland, the Benton County Board of Commissioners were responding to an Oregon Land Conservation and Development Commission (LCDC) order to *develop a protection program for 147 acres of wetland* northeast of the Corvallis/Benton County Urban Growth Boundary. The LCDC and Benton County had also determined that Jackson-Frazier Wetland qualified as a Goal 5 Significant Natural Area and Wetland under the Goal 5 Rule [OAR 660-16-010 (1) and (3)]. The County response took the following form (Benton County Planning File #L 90-10) on February 9, 1991 and involved the following steps:

- Amended the Economic, Social, Environmental, and Energy (ESEE) analysis of February 2, 1991
- Created and applied a Wetland Overlay on the entire 147-acre wetland
- Created and applied a protective Open Space Zone on 117 acres of County wetland ownership
- Established the County property as a protected wetland
- Adopted the Task Force Management Plan as a legislative amendment to the County Comprehensive Plan and Development Code
- Required that any future management plan also be adopted as part of the Comprehensive Plan.

Therefore, this revised plan serves two purposes: (1) satisfies statewide planning requirements, and (2) becomes an official part of the Benton County Comprehensive Plan to guide future management of the natural area and park.

Nelson's Checkermallow at Jackson-Frazier Wetland

Chapter 2
SITE DESCRIPTION & CURRENT MANAGEMENT

This chapter describes the physical and biotic features of the Jackson-Frazier Wetland site, outlines current public use and management activities, and identifies current zoning and ownership characteristics, including adjacent properties. Earlier documentation of many features is included in the Jackson-Frazier Wetland Economic, Social, Environmental, and Energy Analysis (Benton County Comprehensive Plan Background Reports, 1991), hereafter referred to as Jackson-Frazier Wetland ESEE, 1991.

Physical Features

Jackson-Frazier Wetland is located northeast of Corvallis, immediately outside the Corvallis Urban Growth Boundary at the north end of Lancaster Street (Map 1). The wetland was established as a Benton County Park in 1992 to protect its natural features and allow for education, research, and passive public use. The Benton County Natural Area & Parks Department administers almost all of the 147-acre wetland, with assistance from the Jackson-Frazier Wetland Technical Advisory Committee. The natural area managed by the County now encompasses 144.5 acres. Of this, 131.68 acres are wetland (including 13.68 acres of wetland acquired since establishment of the natural area unit in 1992) and approximately 14 acres are upland (non-wetland) and originally part of the area.

Geology

Over a period of thousands of years, waters of Jackson and Frazier Creeks draining from what is now known as McDonald State Forest have carried fine silts and clays, depositing them after floods over a coarser silt layer dating to late glacial times. The resulting clay-rich wetland soils shrink and crack during our dry summers, and in winter, the cracks swell shut and drainage is impeded. Since topographic slopes are less than one percent, ponding is common throughout the wetland from mid-November to mid-June. Water depths in creeks and remnant drainage ditches in June vary from less than a foot to two feet. Some years, the wetland dries out by mid-May, while during other years it is still soggy in July. Our understanding of the hydrological, pedological, and geological history of the Jackson-Frazier Wetland has been enhanced by the work of David d'Amore who analyzed the wetland soil history, its characteristics, and hydrology (d'Amore, et al. 2000, 2004).

Floodplains

Early in the wet season, October-December, the wetland retards and slightly diminishes downstream flooding prior to full saturation (Buffkin Drost), 1985). Most of the wetland is encompassed within the AH zone of the 100-year floodplain that extends more narrowly upstream along the Jackson and Frazier Creek drainages (Jackson-Frazier Wetland ESEE, 1991). Normally, flooding is confined to these drainages below about 127 feet, MSL; however, the 1964-65 flooding was reported to involve Willamette River backflow into the wetland. Under heavy precipitation events, the wetland often is flooded a foot or more from watershed waters.

Drainage

Examination of a 1936 aerial photograph, the earliest available, shows a fine pattern of drainage furrows and a recently excavated ditch connecting with Stewart Slough that drains the wetland to the southeast. Prior to this major ditching, the wetland drained northeasterly into Frazier Creek Ditch. Both Stewart Slough and Frazier Creek Ditch flow into the Willamette River (Map 2). Historically, the wetland contained no ponds although two shallow depressions were excavated as

duck ponds during the 1930s and 1950s. In 1985, wetland drainage was deliberately, although superficially, altered by the landowner, this damage was later assessed by Scientific Resources, Inc. (1986). In their report, the authors also described and mapped the Jackson-Frazier Wetland drainage system and delineated the wetland in accordance with Division of State Lands standards. The confluence of Jackson and Frazier Creeks is north and west of the County-owned wetland, located in the northeast part of Owens Farm west of Highway 99W.

The Jackson Creek portion of the watershed embraces more than 1,500 acres, and the Frazier Creek watershed contains more than 2,200 acres (Map 2). The largest wetland in the Jackson and Frazier Creek basins is a 234-acre wetland complex west of Highway 99W, a portion of which is owned by Greenbelt Land Trust (City of Corvallis, 2003).

Soils

The Benton County Area Soil Survey (Knezevich, 1975, revised 2000) identifies four major soil series in the wetland area: Waldo silty clay loam (Wa–47%), Bashaw clay (Bc–37%), Woodburn silt loam (WoA–10%), and Dayton silt loam (Da–5%). The first three are hydric soils developed under a deficit of soil oxygen, and the Woodburn soil is an upland soil. Bashaw clay and Waldo silty clay are the most prominent, and the Waldo soil is found primarily in association with inflowing streams and tall ash trees. Soil mapping is shown in the Jackson-Frazier Wetland ESEE, 1991.

Biotic Features

Wetland Types

The National Wetland Inventory maps wetland types employing the Cowardin classification based on hydrology, substrate, and vegetation (Cowardin et al. 1979). There are four Cowardin wetland types in the Jackson-Frazier wetland: PEMC Palustrine Emergent Seasonally Flooded; PEMF Palustrine Emergent Semi-permanently Flooded; PSSC Palustrine Shrub/Scrub Seasonally Flooded; and PFOC Palustrine Forested Seasonally Flooded. The wetland was delineated as a jurisdictional wetland in 1986 (Scientific Resources Inc. 1986).

John Marshall examined vegetation structure and mapped five wetland types that roughly corresponded to Cowardin types: (1) forested wetland, (2) shrub-scrub wetland, (3) emergent wetland (sedge-rush prairie), (4) seasonally open water, and (5) forested non-wetland. Each type is comprised of several plant communities, and these types are also identified and mapped as 15 plant communities (Marshall 1985).

Jackson-Frazier Wetland quality has been assessed a number of times. A wetland assessment is a qualitative or semi-quantitative analysis of the functions and/or values of a wetland. There are many types of assessment and several have been applied to Jackson-Frazier Wetland. Most recently, the wetland was evaluated by Department of State Lands staff employing the Oregon Fresh Water Assessment Methodology (OFWAM) (Roth et al. 1996) and by the Hydrogeomorphic Method (HGM) (Brinson 1993).

OFWAM is designed as a simple tool for assessing the quality of a wetland based on nine categories (wildlife habitat, water quality, hydrologic control, etc.). Using both field and office-derived information, OFWAM is estimated to take 10-24 hours per acre of wetland to apply. The method is basically descriptive and although it purports to evaluate wetland functions its does not achieve that

goal. Basic reference is Roth et al. 1996. Jackson-Frazier Wetland rated high (intact) in eight of nine categories.

Paul Adamus surveyed Jackson-Frazier Wetland using Brinson's Hydro-Geomorphic Method (HGM) (Adamus 1998). The wetland was identified as a Riverine Impounding (RI), non-permanently flooded and permanently flooded subclass within the Riverine System. The wetland was listed by Adamus in 2001 as a HGM reference site and was judged "least altered" (the highest quality rating) (Adamus 2001).

HGM aims to assess the functions of a wetland or the levels of wetland performance with regard to hydrology, nutrient cycling, habitat properties and processes, etc. It first analyzes the landscape position of the wetland, and then considers various wetland functions such as water storage, nutrient transformation, habitat and food web support, etc. Basic to this method is the use of reference sites. Application of HGM involves an initial large commitment to regional analysis possible only under federal funding. Use of HGM in Oregon has not been meaningfully accomplished. Jackson-Frazier Wetland was judged to be in the Riverine Impounding Subclass and least altered wetlands in the Willamette Valley Ecoregion and is considered a Reference Wetland.

Vegetation and Flora

Wetland vegetation is essentially unstable over time, changing with varying hydrology, disturbance, and natural succession. For Jackson-Frazier, cessation of Native American burning, elimination of livestock grazing, and attempts to drain the wetland, all have influenced vegetation change. Since cattle were removed from the wetland in the early 1960s, shrubs (especially rose and hawthorn) and trees (Oregon ash) have progressively invaded the wetland replacing open prairie by dense woody vegetation and forest as documented by Jones (1998). Lacking management intervention, much of Jackson-Frazier Wetland will probably revert to forested wetland dominated by Oregon ash over the next 30 to 50 years (Franklin and Dyrness, 1988; Frenkel and Heinitz, 1988). Besides native species, other plant invaders, especially reed canarygrass, pose serious management problems. Some alien species of note include wild apple and pears, purple nightshade, and sweetbrier rose. Nonetheless, Jackson-Frazier flora is mostly native. The fruit trees that are common are dispersed by birds and were not planted orchard as trees.

More than 300 species of flowering plants have been recorded in the wetland including several rare taxa. In 1996-98, Dr. Richard Halse, Curator of the OSU Herbarium, updated a vascular plant list for the wetland (Appendix 12). Three species in the property are federally and state listed as threatened or endangered (Table 1).

Table 1.
Federal and State Threatened and Endangered Plants in the Jackson-Frazier Area

NAME		***STATUS***	
Botanical	**Common**	**Federal**	**State**
Lomatium bradshawii	Bradshaw's lomatium	Endangered	Endangered
Sidalcea nelsoniana	Nelson's sidalcea	Threatened	Threatened
Lupinus sulphureus var. *kincaidii*	Kincaid's lupine	Threatened	Threatened

In 2003, Dr. Thomas Kaye conducted a rare plant survey, and identified locations, abundance, and management recommendations for the three rare plants listed in Table 1. All three plant populations are described as in poor condition.

Animals and Habitats

Jackson-Frazier Wetland serves as a diverse wet green island within the sea of the more developed Willamette Valley landscape. Consequently, the wetland provides important habitats and refuge for birds and other animals. More than 70 birds have been identified. Mallard, Red-tailed hawk, Virginia rail, Sora, Black-capped chickadee, and Marsh wren are common residents. Don Boucher has compiled a list of birds with reference to their habitat and abundance (Appendix 13). A poster, bird checklist, and interpretive panel have also been produced.

Common mammals in the wetland include deer, fox, raccoon, beaver, and nutria. There is no site-specific animal list. Much interest has been expressed about invertebrates, especially aquatic insects, and butterflies. Inventories of these taxa are now underway.

Public Use Features and Administration

Access

Major public access to Jackson-Frazier Wetland is by the northern extension of Lancaster Street terminated by a wide cul-de-sac with parking for about six vehicles, handicapped parking, and additional parking along Lancaster (Map 3). A short concrete pathway with a wood fence and bridge leads eastward to the kiosk area, which forms the wetland entrance. Alternative access to the wetland is from a sharp bend in Canterbury Circle from which a concrete footpath leads west to the kiosk and boardwalk. The wetland is also connected to Cheldelin Middle School by this short paved walkway. City of Corvallis bus access is provided from stops along N.E. Conifer Blvd., about a 10-minute walk to the wetland north along Lancaster. No other public access is provided (Map 1 and Map 3).

Brown highway signs, direct visitors to the wetland at Highway 99W and Conifer, U.S. Highway 20 and Conifer, and Lancaster and Conifer. Two County park entrance signs announce general access to the natural area.

Facilities

From 1993-1995, facility planning was interactive between John Stewart (a consultant), County staff, and the advisory committee. The key element for public use of the wetland was completion of

the “Jackson-Frazier Wetland Facility Plan” (Stewart, 1995). Map 3 (Public Use Area Facilities) depicts many of the facilities in the Public Use area, and Stewart’s facility plan reflects the 1992 Management Plan Goals and Recommendations. The following elements were addressed in both:

Wetland Access: Prior to 1993, several informal paths entered the wetland from nearby residential areas, and some were damaging the wetland. In 1993, a route for an elevated walkway was flagged and brushed out with the idea of providing visitors with views of all major wetland types, and at the same time insuring visitor privacy. This route became a chief feature of Stewart’s plan. In 1995, Benton County retained Aron Faegre and Associates to prepare a construction plan for a 4.5-foot wide boardwalk that could be built by a volunteer youth work force under supervision.

With major funding from the Environmental Protection Agency for materials, construction of a 3,400-foot boardwalk was initiated in 1996 and completed, mostly by youth and volunteers, in 1998. The boardwalk meets ADA requirements and is frequently used by individuals confined to wheelchairs.

Education and Interpretation: As a means of identifying the wetland entrance and providing information to the public, a kiosk was built in 1993 by staff and volunteers. Over time, six educational panels have been completed and are located along the boardwalk. These panels can be seen on the Jackson-Frazier Wetland website located at: http://www.co.benton.or.us/parks/jfraz.htm. Brochures about the wetland have also been prepared and are publicly available. Although visitors are encouraged to use the boardwalk to prevent degradation, off-boardwalk, access is allowed by permit for educational groups and researchers.

An element of public use is informing visitors about the wetland. The Benton County Natural Area & Parks Department maintains the website listed above that describes park features and displays other available information. School groups are invited to use the wetland as an outdoor classroom.

Another important use of the wetland has been for research, much of which has been conducted by Oregon State University students who have completed approximately 11 projects, at both MS and PhD levels (Appendix 11).

Edge Control: The issue of "edge control," which refers to public use at the immediate boundaries of the wetland, is stressed in Stewart's plan. Edge control at Jackson-Frazier Wetland is achieved in part by placement of a wire fence along the southern boundary and a wooden fence along the publicly accessible concrete walkway adjacent to the wetland. County staff and the advisory committee members have made a concerted effort to contact neighbors in the neighborhood housing project south of the wetland and other neighborhood groups to gain cooperation in protecting the facility. These efforts have proven very successful.

Connectivity: Connecting Jackson-Frazier Wetland to a comprehensive city-county-state open space system, has been furthered by passage in 1999 of the Corvallis Open Space bond measure and subsequent protection of Owens Farm through acquisition by the City and Greenbelt Land Trust. Trail linkage is currently being explored.

Management and Restoration

Benton County, assisted by the Jackson-Frazier Technical Advisory Committee, manages the Jackson-Frazier Wetland as a natural area. Over the past decade, management emphasis has been placed on developing infrastructure to accommodate appropriate public use, site protection and management of wetland features, public education, and research. More recent efforts and resources have targeted restoration and testing alternative restoration techniques, with three main restoration goals:

- Control of reed canarygrass and other alien species such as false brome
- Recovery of three federally listed rare plants: Bradshaw's lomatium, Kincaid's lupine, and Nelson's checkermallow
- Restoration of wet prairie that was severely damaged by the previous owner and is now being invaded by shrubs, ash, and hawthorn trees

To further these goals, in 2004 Benton County entered into an agreement with the U.S. Fish and Wildlife Service to participate in the Oregon Partners for Fish and Wildlife Program. This agreement covers a 10-year period with the purpose of restoring wetland resources in Jackson-Frazier Wetland (U.S. Fish and Wildlife Service, 2003).

Zoning, Ownership, and External Relationships

Jackson-Frazier Wetland has undergone a number of zoning changes in the past as documented in the Jackson-Frazier Wetland ESEE, 1991 (Appendix 1). In 1978, in association with the County Comprehensive Plan development, Benton County zoned the wetland for Exclusive Farm Use (EFU). That zoning prevailed until 1992. Upon acquiring the property that year, the County rezoned the public land as Open Space with a Wetland Overlay where appropriate as shown in the ESEE (Table 2).

Table 2.
Wetland and Non-Wetland Ownership and Zoning in 1992*

Owner	Wetland (ac)	Non-Wetland (ac)	1992 Zoning
Benton County	117		Wetland Overlay & Open Space Zone
Benton County		27	Open Space Zone
Dunning (Lyons et al.)	29		Wetland Overlay & EFU
Owens (GLT)	1		Wetland Overlay & EFU
TOTAL (approx.)	147	27	

** Ownership, zoning, and acreage have changed since 1992.*

Adjacent and More Distant Properties

Two parcels have been added to Jackson-Frazier Wetland. On August 2, 2001 Benton County added 9.6 ac. of wetland located at the northeast corner of the property acquired by a Density Bonus for a Planned Unit Development as allowed under Benton County Code, Chapter 100. And, on December 20, 2003, the Greenbelt Land Trust donated a 4.06 ac. contiguous parcel at the southwest corner of the wetland (see Map 4) with an attached Conservation Easement (Appendix 1). At present both retain their original EFU zoning as of 1991.

Properties proximate to the Jackson-Frazier Wetland north and east are in large private ownerships (Map 4) that are zoned EFU. The two parcels due south of Jackson-Frazier Wetland are owned by the City of Corvallis. Both parcels are zoned PR 12 but are included in a Planned Development Overlay reflecting the fact that these parcels are wetland mitigation sites and are therefore protective of Jackson-Frazier Wetland.

Two properties west of the wetland and east of Highway 99 are owned respectively by the City of Corvallis and Greenbelt Land Trust and were part of the original Owens Farm (Owens Farm Open Space Management Plan, 2004). Both parcels are outside the City's Urban Growth Boundary and are zoned EFU by the County. The City proposes changing zoning of their parcel within the city jurisdiction to PLOS (Public Land Open Space) with a recommended CR (Conservation/Restoration) Management designation. Greenbelt Land Trust has not completed its management plan. Their parcel, at present, is zoned EFU. In our judgment, zoning and intended management of lands immediately to the west of Jackson-Frazier Wetland are protective of the wetland. Other lands surrounding the wetland to the north and east are either zoned EFU or have a wetland overlay. These properties are used primarily for grassland farming or open space. Little residential property abuts Jackson-Frazier Wetland (Map 4).

In the broader area to the south and east of the wetland, properties are zoned Low Density Residential, Medium Density Residential, and Medium-High Density. They include a mix of single-family housing, apartments, and a multifamily neighborhood housing project. Located nearby to the

south is an assisted living facility, whose residents make use of the wetland. Cheldelin Middle School is a short walk to the wetland by a pedestrian path (Map 1 and Map 3).

Within the Jackson-Frazier Wetland watershed, the City of Corvallis has applied a "Probable Wetland Overlay Zone" designation to wetlands in the floodplains of the Jackson-Frazier Creek basins. The North Corvallis Area Plan (2001) assumes that approximately one-half of the development potential of the 234 acres within the wetland overlay west of Highway 99W may be developable consistent with existing zoning (Map 2). Development proposals will be required to prepare wetland determinations and delineations and meet Department of State Lands wetland regulations.

The City of Corvallis also applies a Significant Stream Corridor Overlay designation to perennial streams included in the Open Space-Conservation designation, which includes Jackson and Frazier Creeks (North Corvallis Area Plan, 2001). These designations are intended to protect water quality of the streams, mitigate development impacts, and conserve riparian vegetation.

Acquisition of Owens Farm by the City of Corvallis and Greenbelt Land Trust west of Highway 99W provides additional public open space and protection for the lower part of the watershed. The portion acquired by Good Samaritan Hospital is zoned Mixed-use Commercial and Residential and is envisioned for future hospital-sponsored residential use and medical facility development. The Owens Farm Open Space Management Plan (2004) provides an opportunity for the City of Corvallis and Benton County to collaborate along with Greenbelt Land Trust to protect, restore, and enhance several hundred acres of public open space and wetland, as well as meet mutual land management goals with the hospital.

Regional Planning and Connectivity

The Benton County Trail System Plan (2003) proposes a *conceptual* multi-use trail route connecting Jackson-Frazier Wetland with Owens Farm, Chip Ross Park, and McDonald Forest (Map 5). The Approved Plan Diagram for the North Corvallis Area Plan proposes multi-use trails that would connect Jackson-Frazier Wetland with a trail along both creeks to the west and along the northern edge of Jackson-Frazier Wetland, and along an extension of Lester Avenue connecting with the Jackson-Frazier Wetland boardwalk. A multi-use trail is also proposed along Highway 99W. Portions of these routes across the Jackson-Frazier Wetland are probably not feasible since they would require very long sections of elevated walkway and several bridges. At this point in time no specific trail location has been selected.

Both the North Corvallis Area Land Use Plan (2001) and the Corvallis Natural Features Inventory (2003) provide baseline resource information and growth management planning for the Jackson-Frazier Creek basins. The North Corvallis Area Plan encourages use of "green infrastructure" and Best Management Practices to preserve water quality in receiving streams and to create open storm drainage systems maintaining natural processes.

It is clear that in both the short-term and long-term, that the City of Corvallis contemplates trail linkages between Jackson-Frazier Wetland and other parks and trail systems in the Jackson Creek watershed (Map 5). However, none of the planning documents broach the major barrier to accomplish these linkages which is a feasible crossing of Highway 99W and the W&P Railroad right-of-way.

It is also clear that the City of Corvallis desires to protect the watershed of Jackson-Frazier Wetland, but meaningful riparian setbacks and policies for achieving protection are not in place. This situation requires continued vigilance on the part of the Benton County Natural Areas & Parks Department and the Jackson-Frazier Technical Advisory Committee.

Allen Throop at Jackson Frazier Wetland 2004

Chapter 3
POLICY FRAMEWORK

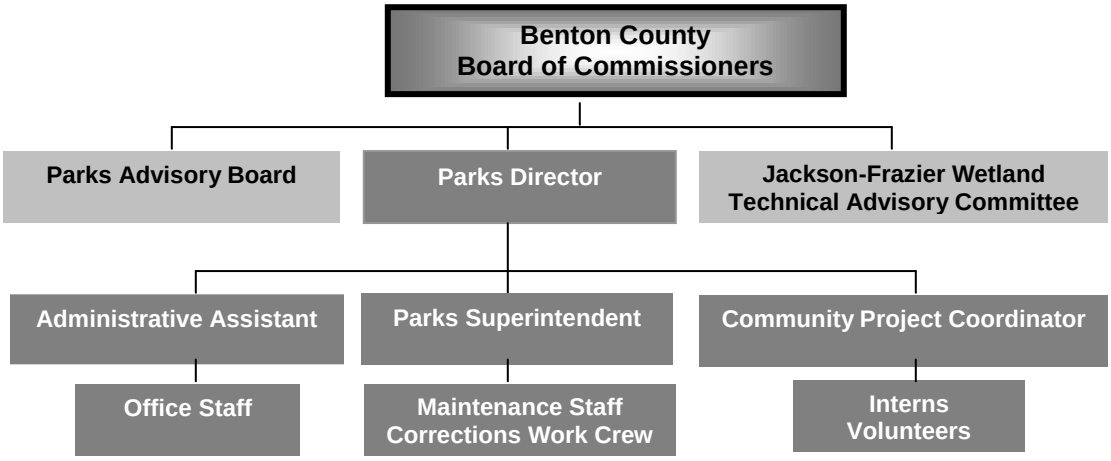
With establishment of Jackson-Frazier Wetland as a natural system county park in 1992, the Benton County Natural Areas & Parks Department launched an entirely different but highly complementary program calling for technical expertise and employment of new and diverse opportunities in outdoor education, nature interpretation, passive recreation, and landscape restoration. By protecting a significant wetland and natural area, Benton County linked a traditional parks program with Oregon's progressive statewide land use planning system and has become a role model for demonstrating how a natural park system can be woven into the community fabric. It should be recognized that the many accomplishments achieved to date have been the result of recommendations and implementation proposed in the 1992 management plan. This chapter describes the organization of this refined plan that flows from Vision and Mission to Issues to specific Policies and policy Implementation Measures.

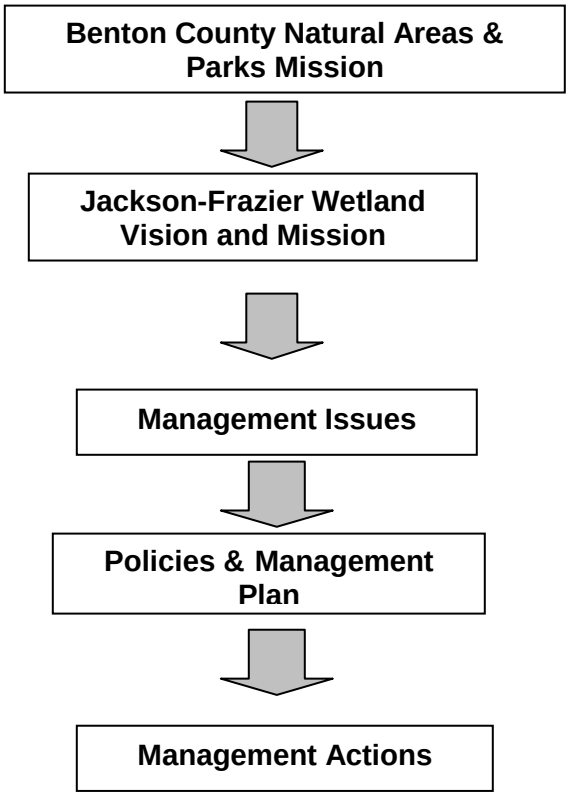
Organization of Refined Plan

Plan development and approval follow these steps: Benton County Natural Areas & Parks staff and the Technical Advisory Committee jointly develop the plan, which was then approved by the County Parks Advisory Board, Natural Area & Parks Director and County Planning Commission prior to final approval by the Board of Commissioners. The public initially contributed to plan formulation and has reviewed the final draft document. Public comments are summarized in Appendix 16.

Relationships between the County Board of Commissioners, advisory committees, and County Natural Areas & Parks staff are important. The diagrams below (following page) display the organizational structure of Benton County Natural Areas & Parks Department and the Jackson-Frazier Wetland Plan framework.

Benton County Natural Areas & Parks Administrative Structure





Vision for Jackson-Frazier Wetland

Jackson-Frazier Wetland was acquired by the county in 1990 and managed since1993 by the Benton County Natural Areas & Parks Department for protection and public use. The following vision for the wetland links the historic to the future landscape and sets forth the direction of the revised plan.

Jackson-Frazier Wetland Vision

Jackson-Frazier Wetland is a fragment of the Willamette Valley's varied natural and human heritage, altered through two centuries of changing land use. The site is valued for its biodiversity consisting of a mosaic of native wetland prairie, mixed wetland forest-shrub habitat, a narrow band of riparian ash forest, and includes small populations of three plant species that are federally listed as endangered or threatened.

Jackson-Frazier Wetland will be protected, restored, and managed as a model project, demonstrating and testing natural area management implementation and methods. Jackson-Frazier Wetland will be an accessible place for people to be inspired and to wonder, and a quiet refuge for solace. The wetland will serve for people to learn about vegetation succession and natural processes. As time progresses, Jackson-Frazier will increasingly contrast with the surrounding densely settled and built landscape, all the while itself changing in response to altered climate, water flow, management, restoration, and neighboring development.

In the future, Jackson-Frazier Wetland will exhibit increased connectivity to its watershed by an open space corridor, including a public trail and a network of riparian strips and streams.

Mission for Jackson-Frazier Wetland

The Benton County Natural Areas & Parks Department will fulfill its vision for the Jackson-Frazier Wetland through a commitment to the goals outlined in this mission.

Jackson-Frazier Wetland Mission

As a Benton County natural area, the mission of Jackson-Frazier Wetland is to protect and restore the wetland and its diverse plant communities and to provide the public with a resource for passive recreational and educational use and for research opportunities focused on the following goals:

- The wetland will serve as a model for natural area protection, restoration, and management including research, application of different management implementation, experimentation, and monitoring.
- Preferred public use will consist of nature-oriented activities including walking, nature study, bird watching, and photography
- Opportunities will be available for classroom study and less formal learning about wetland processes, characteristics, functions, and values.
- Opportunities for volunteers will continue by engaging the community in hands-on management activities.
- Connectivity will be promoted with the regional landscape.

Jackson-Frazier Wetland (photography by Denise W. Ross)

Management Issues

Many years of management planning and practice together with help from scientists and other professionals have provided a valuable knowledge base from which to identify management issues and revise those identified in the 1992 management plan. Based on this experience, Table 3 identifies selected management issues that are considered important for developing a new and updated management plan. Appendix 2 lists more than 40 issues, and additional background on the most relevant issues is included in other appendices.

Mechanical removal of ash trees encroaching on wet prairie in October 2003

Table 3.

Major Management Issues Identified for Jackson-Frazier Wetland

Management Element	*Management Issues*
General Management	- Degree and intensity of management - Multiple management goals, i.e., pubic use and restoration - Public information and awareness - Financial and in-kind support (grants, donations, contributions)
Public Use and Connectivity	- Type and range of appropriate public uses - Level of public use/access consistent with wetland protection - Connectivity to other city/county trails and trail systems - Monitoring human impacts and engendering preferred use - Public use conflicts with management goals and practices
Restoration	- Restoration goals, i.e., what is "natural" and what is feasible - Recovery of threatened rare plant species in poor condition - Restoration of historically disturbed plant communities toward target communities - Choosing restoration options and implementation; how to stratify the wetland for management purposes - Maintaining role as a demonstration site
Vegetation Management	- Managing volunteers and other partners in vegetation projects - Identification, inventory, and control of alien invasive species - Problem of management of invading native trees and shrubs - Protocol for vegetation management in Public Use Area - Best and feasible management techniques to meet objectives - Disposal of waste material
Hydrology	- Potential for urban development in the watershed to alter wetland hydrology in the wetland watershed - Lack of hydrological baseline information - Restoration of "pre-disturbance" hydrology to the extent feasible - Pond and ditch removal or repair
Wildlife Management	- Control of "pest" species, i.e., nutria - Information and research needs - Coordinating habitat management and vegetation management - Impacts of public use on wildlife
Education and Research	- Location of off-boardwalk activities; potential ed. impacts on site - Lack of information and research results - Location of research projects; scientific vs. applied research
Off-site and Adjacent Uses	- Geographic scope of management plan - Private ownership of portion of the wetland; lack of control - Potential impacts of adjacent lands and watershed decisions - Effect of wetland management options on adjacent and/or downstream landowners

Opportunities and Constraints

Site characteristics of Jackson-Frazier Wetland and its surroundings provide many opportunities and constraints for wetland management. These opportunities and constraints, however, will constantly change with time. For example, while well protected today, the wetland certainly will be impacted by the full build-out of north Corvallis, which poses a potential threat to wetland hydrology and landscape setting. While today the watershed and views yield outstanding opportunities, these very values and views may be constrained by future build-out.

Opportunities

***Natural Area Significance*:** Due to its size, quality, and biotic diversity, Jackson-Frazier Wetland is one of the Willamette Valley's most valued natural areas, especially because almost 60 percent of the valley's wetlands have been lost or significantly degraded. This fact alone makes the wetland important for protection, education, and research. Such a large public natural area is also a key element in Corvallis's open space system. In addition, Jackson-Frazier Wetland is a registered state Natural Heritage Resource (Oregon Natural Heritage Program, 2003), which recognizes the wetland's value as a natural area.

***Protection*:** Much of the adjacent land use and zoning are compatible with Jackson-Frazier Wetland, as they consist of large ownerships on the edge of the Corvallis Urban Growth Boundary and afford off-site protection for the site. Parcels to the south owned by the City of Corvallis and adjacent lands to the west owned by the City and Greenbelt Land Trust (part of Owens Farm) further enhance resource protection of the wetland.

***Visual Qualities*:** Scenic beauty and peaceful qualities of the wetland emanate from contrasting wet prairie, shrub, and forest vegetation, as well as the splendid views of open hillsides and the McDonald Forest ridgeline in the distance. Surrounding lands are farmed or undeveloped and contribute to the pastoral setting. Recent public acquisition of Owens Farm will further protect the viewshed.

***Public Use*:** The wetland offers outstanding opportunities to the community for passive recreation and education, including potential as a demonstration research area in close proximity to Oregon State University and local schools. The boardwalk offers wheelchair access, numerous interpretive facilities, and a view of many wetland types. Easy access and carefully designed and sited facilities greatly enhance the visitor's experience.

Connectivity: Visitors can easily access the wetland by vehicle, bus, or bicycle. A short walk brings Cheldelin Middle School students and residents from a nearby assisted living center and neighborhood housing project to the boardwalk loop. West of Jackson-Frazier Wetland, Owens Farm represents a significant open space providing a potential connection to Jackson Frazier Wetland. In addition, Owens Farm Open Space secures the confluence of Jackson and Frazier Creeks and creates a toehold along Jackson and Frazier Creeks wetland complex that could ultimately link a proposed public open space trail connection to Chip Ross Park and McDonald Forest.

Potential exists for a Rails-with-Trails project along the close by railroads near the eastern and western edges of the wetland, providing opportunities to link Jackson-Frazier Wetland with the Corvallis multimodal bikeway system along Highway 99W.

***Partnering*:** Proximity of Owens Farm to the wetland affords an excellent opportunity to develop stewardship partnering with the City of Corvallis and Greenbelt Land Trust. This collaboration between the City and County to achieve watershed protection by using Jackson-Frazier Wetland as benchmark to maintain natural stream flows and water quality upstream is important in maintaining wetland hydrology. Benton County also has an opportunity to continue the legacy of working with community volunteers, neighborhood residents, non-profit organizations, state and federal agencies, and educational institutions to fulfill the mission of the Jackson-Frazier Wetland that calls for education, research, and demonstration.

Constraints

Resource Protection: Adequate hydrologic security for the wetland is essential but elusive. With no County jurisdictional control over land use and development decisions in the watershed, weak City riparian setbacks, and permissive water quality protection codes, Jackson-Frazier's hydrologic input is at risk. In addition, historic disturbance of site hydrology within the wetland has helped reduce the wet prairie and encourage shrub and forest invasion within the protected wetland, presenting a major challenge for restoration efforts.

Invasive species pose a danger to the relatively intact wetland flora. Management of invasive species is constrained by a limited number of control methods. Conversely, this lack of knowledge presents an opportunity for testing and experimenting with new techniques in partnership with other groups such as The Nature Conservancy.

Protecting and recovering listed threatened and endangered plant species is a management responsibility that provides both constraints and opportunities. Threats to existing populations of threatened and endangered species must be addressed, and a variety of methods must be evaluated to determine their appropriateness at Jackson-Frazier Wetland. As a public agency, Benton County has a responsibility under the Endangered Species Act to maintain and increase listed plant species populations. Benefits from some methods of enhancing listed species are under development, providing an opportunity for research and demonstration.

***Public Access and Visitor Management*:** Public use and education must be managed in a way that is sensitive to the fragile characteristics of the site and consistent with protecting the wetland. Maintaining low-impact, nature-oriented use with suitable internal access and accommodating educational and research pursuits requires management skill and a commitment to management policies. Herein, lies a major opportunity for public awareness and partnering as an integral component of visitor management and control.

***Connectivity*:** Highway 99W and the W&P Railroad are major physical and jurisdictional barriers to connecting the Jackson-Frazier Wetland with the broader protected and urbanizing landscape to the west. Until the crossing of the highway and railroad is solved, safe pedestrian and non-motorized east-west linkage is impossible. A second constraint to trail linkage is the substantial wetland both east and west of the highway-railroad transport route. However, this constraint can be overcome by constructing a wooden walkway and bridges. Although these might be expensive to build, the challenge provides a strong incentive for partnering with the City, Greenbelt Land Trust, non-profit groups, and volunteers.

Management Options

County staff and the Jackson-Frazier Wetland Technical Advisory Committee examined existing and potential management options for the site, including how to stratify the wetland for management purposes based on underlying issues related to different approaches. These three options are listed in the following table:

Table 4.
Selected Range of Options for Managing Jackson-Frazier Wetland

How should Jackson-Frazier Wetland be managed?		
1. Maintain Status Quo	**2. Maximize Biodiversity (Integrated Management)**	**3. Maintain Wetland Prairie**
Maintain a plant and animal refuge by allowing vegetation change with little intervention and maintain only a special area for restoration and educational display.	*Maximize biodiversity by maintaining the current* and *projected historic pattern of a mix of restored wet prairie, naturally changing shrub wetland, and ash forest (current plan concept).*	*Maintain as much as possible of the wetland area as wetland prairie (complete restoration).*

Committee members favored an *integrated management* option consistent with the aim of the1992 plan. This option delineates specific management units and establishes management regimens that would be adjusted to different and/or similar characteristics of each area.

Management Units

The preferred management of Jackson-Frazier Wetland is active, integrated management using a variety of methods and levels of intensity adapted to the goals and ecological characteristics and conditions of the natural landscape. Accordingly, the wetland is classified into management units, named for their primary use and inherent qualities. Each management unit has a different set of uses calling for different management strategies; however, most management units will accommodate multiple uses requiring different strategies. Five management units and their primary functions are identified in Table 5 and illustrated in Map 6: Management Units.

Table 5.
Jackson-Frazier Wetland Management Units and Primary Purposes

Management Units	Code	Primary Activity (Purpose or Use)
Public Use	PU	Passive Recreation Boardwalk-Limited Education
Wetland Prairie	WP	Protection, Restoration, Education by Permit; Research by Permit
Mixed Wetland Forest-Shrub	MWFS	Protection, Restoration, Research by Permit
Upland	U	Protection, Research by Permit
County Reserve	CR	Buffer between the Wetland and Neighborhood Housing

***Public Use Management Unit*:** Approximately 13 acres in the southeast quadrant of the wetland, this unit is allocated to public use without permit along and near the boardwalk. This area has good representation of all habitats and communities of the site including seasonal ponds and creeks, wetland prairie, and mixed forest shrub vegetation. Passive recreation along the boardwalk such as walking, nature study, bird viewing, and photography will be the most common activities along with education (displays, etc.).

Wetland Prairie Management Unit: Approximately 17 acres in the southwest part of the wetland, this unit is currently highly visible and much disturbed by damage done by a former owner. A remnant population of federally listed Bradshaw's lomatium survives within the area. Restoration will be the primary activity for this unit. Such experimental management strategies as burning, mowing, and targeted herbicide treatment or other deliberate disturbance may be conducted here. The unit is large and easily accessible enabling educational groups under permit to have hands-on experiences. Monitoring of vegetation will be an ongoing activity. Research under permit will be allowed.

***Mixed Wetland Forest-Shrub Management Unit*:** Approximately 100 acres in the northern half of the wetland, this unit is a mosaic of small patches of prairie, large areas of young ash forest, riparian forest along seasonal creeks, and an extensive area of shrub vegetation that is being invaded by trees. Natural succession to ash forest is proceeding rapidly. Walking in this area is difficult with many obstacles. Protection is the major management activity for this unit although research will be encouraged. Restoration will typically target such actions as reed canarygrass control and small-scale experiments to encourage forest conversion to prairie. Research will be directed to this less visible and visited area.

***Upland Management Unit*:** Approximately three acres, dominated by maple trees, comprise this small-elevated unit in the northwest part of the wetland. The area has a small population of federally threatened lupine and includes some troublesome non-wetland plant species (English ivy, holly, and an invasive grass known as false brome or *Brachypodium sylvaticum*). Major management actions for the area will be protection and restoration. Although small, the area should be attractive for inventory research, including a possible archeological survey.

***County Reserve Management Unit*:** Approximately 11 acres, this triangular non-wetland parcel southeast of the wetland is an abandoned field last farmed in the late 1970s. This area is now covered by blackberry thickets and receives little use.

Management Priority

In order of decreasing priority, management actions will be directed toward the following units: Public Use, Wetland Prairie, Upland, and Mixed Wetland Forest-Shrub. Criteria for priority include degree of public use, resource sensitivity, difficulty of implementing action, and probability of success. Where no management is applied, that decision is considered to be deliberate or made for lack of funding. Some management actions will be applied to every unit, such as protection, invasive species control, endangered or threatened species recovery, and public use management.

Chapter 4
MANAGEMENT POLICIES

This chapter identifies the policies that will guide management decisions for the Jackson-Frazier Wetland. These policy statements provide direction for more specific management strategies, prescriptions, and actions that are required to fulfill the vision and mission of the wetland. Each policy is itemized by several issues and findings that have emerged from the planning process.

Policy 1: PROTECTION

The overriding goal for management of Jackson-Frazier Wetland is to protect the natural area as a wetland typical of the historic Willamette Valley.

- Derived from statewide land use planning Goal 5 requirement
- Protect existing biological and hydrological conditions
- Protect the wetland from utility rights-of-way and roads
- Use least intrusive management methods necessary for protection

Policy 2: RESTORATION

Where technically and economically feasible, restore damaged or degraded wetland resources to an historically documented state prevailing at Euro-American settlement time using the least intrusive methods available and serving as a model project.

- Determine where, how, and to what degree restoration should be undertaken
- Prioritize restoration needs based on the most critically endangered resources and feasibility
- Restore wetland resources using the least intrusive and most cost effective means
- Involve volunteers in restoration activities to the greatest extent possible consistent with the task involved
- When necessary, secure funds, equipment, and employ external expertise

Policy 3: MANAGEMENT

Apply an integrated management approach to the site, individually targeted to each management unit using a variety of methods adjusted to the varying ecological characteristics, goals, and needs of the management unit.

- Prioritized management unit uses will determine goals, techniques, and intensity of management
- Stratify the wetland into ecologically defined management units
- Consider potential impacts on and from adjacent property
- Use best and most feasible management regimes and practices
- Consider the opportunity for protection, restoration, and management activities as a model project for supervised volunteers and students to demonstrate, test, and monitor the management action

Policy 4: PERSONAL WELL-BEING

Consistent with other public uses, manage Jackson-Frazier Wetland to provide a sense of well-being, safety, privacy, solace, and aesthetic satisfaction.

Policy 5: RECREATION

Consistent with resource protection and other public uses, Jackson-Frazier Wetland shall be managed to provide for passive recreation activities available to everyone.

- Limit facilities to accepted passive recreation activities such as walking, nature study, bird watching, photography, etc.
- Acceptable uses will consist of the above passive nature-oriented activities
- Prohibited uses will include dogs off leash, hunting, bicycling, skateboarding, use of firearms, horseback riding, etc.
- Picnicking and camping facilities will not be provided
- Possibly locate a toilet outside of the wetland near kiosk

Policy 6: EDUCATION

Consistent with resource protection and other public uses, Jackson-Frazier Wetland shall be managed to provide for informal public and school-based education.

- Identify wetland areas that can appropriately accommodate classroom study without resource damage and without interfering with other users
- Classroom activities other than "walk though" observation will be restricted to off-boardwalk locations
- Require permits for off-boardwalk educational use, specifying location, type, intensity, duration, equipment, etc.
- Cooperate with teachers in providing wetland information

Policy 7: RESEARCH

Consistent with resource protection and other public uses, Jackson-Frazier Wetland shall be managed to allow for professional training and non-destructive research.

- Research that assists wetland management activities will be encouraged and given priority
- Require research permits for all research use, specifying location, type, intensity, duration, equipment, etc.
- Encourage research use that can not be seen from the public use area
- Require, at a minimum, sharing research finding summaries with Benton County Natural Area & Parks Department
- Encourage professional training to be scheduled so as not to interfere with other public uses

Policy 8: CONNECTIVITY

Encourage surrounding landowners and planning entities to maintain a conservation approach for land use management to achieve riparian and trail connections to the wetland and within the Jackson and Frazier Creek watersheds.

- Where possible direct surrounding land owners and planning entities to the biological significance of watersheds and their natural values and features

- Direct attention to the scenic integrity of the watershed as viewed from the wetland
- Indicate potential trail connections linking Jackson-Frazier Wetland to Owens Farm Open Space and other park and open space units in the community
- Encourage other agencies to overcome the problem of W&P Railroad and Highway 99W as barriers to trail and hydrological connection to the wetland
- Encourage the W&P Railroad paralleling Highway 99W to initiate a "Rails with Trails" project

Policy 9: OFF-SITE PARTNERING

Collaborate and cooperate with nearby property owners such as the City of Corvallis, Greenbelt Land Trust, Good Samaritan Hospital, and others to work for a watershed approach to wetland management.

- Encourage partners to use a variety of strategies and methods to accomplish beneficial watershed management goals (i.e., riparian setbacks, conservation easements, groundwater protection, etc.)
- Multiple-use and benefits should be considered in all future public works projects, including locating utilities and transportation facilities

Policy 10: VOLUNTEERS

Engage the public in hands-on projects to maintain support and awareness of the benefits of Jackson-Frazier Wetland including education, research, and community wellness.

- Continue the legacy of working with students and other volunteers to achieve the policies and goals of the management plan
- Where possible, design restoration activities as model projects, involving students and volunteers in demonstrating, testing, and monitoring the targeted wetland resources

Policy 11: ACQUISITION

As contiguous or nearby qualifying land becomes available from a willing owner, Benton County may incorporate and protect the land as part of Jackson-Frazier Wetland.

Chapter 5
IMPLEMENTATION

This Chapter lists 24 implementation measures for managing the Jackson-Frazier Wetland. These measures are the basis for action plans and guidelines and may change or be revised over time, reflecting new conditions, opportunities, constraints, and research results. Future targeted plans and guidelines will be developed by the Technical Advisory Committee in consultation with Benton County Parks & Natural Areas staff and presented to the Parks & Natural Areas director as recommendations. Thus, this revised management plan is flexible and can easily be carried forth in the future. Many of the implementation measures identified below are supported by detailed discussion in the Appendices.

Management *(Chapter 3 and Appendix 10)*

1. **Prepare, condense, and publicize information in this revised plan in the form of a public information brochures that can be circulated and displayed on the Jackson-Frazier Wetland website.**
   Relates to Policies 3. *Management,* and 6. *Education*

2. **Jackson-Frazier Wetland shall be managed by an integrated management strategy incorporating a variety of methods meeting a variety of objectives.**
   Relates to Policies 1. *Protection*, 2. *Restoration*, and 3. *Management*

3. **Jackson-Frazier Wetland shall be stratified into management units, each reflecting relatively similar ecological environment, restoration potential, and public use characteristics.**
   Relates to Policies 3. *Management,* and 2. *Restoration*

4. **Manage boardwalk and trailside vegetation by following the standard operating procedure in Appendix 10 detailing vegetation removal.**
   Relates to Policies 1. *Protection*, 2. *Restoration*, 4. *Personal Well-Being*, and 10. *Volunteers*

Restoration *(Appendix 3)*

5. **Prepare and publicize information on restoration activities**.
   Relates to Policies 2. *Restoration,* and 6. *Education*

6. **Restore the *Wetland Prairie Management Unit* to wet prairie dominated by native graminoid (grass-like) species by treating existing tree-invaded, shrubby and graminoid vegetation using a combination of mowing, cutting, herbicide application and burning.**
   Relates to Policies 1. *Protection,* and 2. *Restoration*

7. **Protect vegetation within the *Mixed Wetland Forest-Shrub Management Unit* and restore isolated patches of native open wetland vegetation by selective removal of nearby trees and shrubs by cutting and/or herbicide application.**
   Relates to Policies 1. *Protection,* and 2. *Restoration*

8. **Manage vegetation within the *Public Use Management Unit* for protection to provide the visitor with a diverse and educationally rewarding and satisfying experience. Methods will include selective removal of trees and shrubs for aesthetic reasons, mowing boardwalk edge vegetation, removal of hazard trees, careful disposal of removed debris and an active program to control reed canarygrass within the boardwalk loop.**
   Relates to Policies 1. *Protection,* 2. *Restoration,* and 4. *Personal Well-Being*

9. **Maintain vegetation within the *County Reserve Management Unit* as a buffer separating private land from the County wetland. Treatment of the parcel near the residences shall focus on protecting adjacent property by regular fire line mowing. For the time being, no management will take place for the rest of the area, which serves to protect the adjacent wetland.**
   Relates to Policies 1. *Protection,* and 3. *Management*

Threatened & Endangered Species *(Appendix 5)*

10. **Develop and implement a recovery plan for federal and state endangered Bradshaw's lomatium (*Lomatium bradshawii*) at Jackson-Frazier Wetland following tasks laid out by the U.S. Fish and Wildlife Service Recovery Plan for that species published in 1993.**
    Relates to Policies 1. *Protection,* and 2. *Restoration*

11. **Develop and implement a recovery plan for federal and state threatened Nelson's sidalcea (*Sidalcea nelsoniana*) at Jackson-Frazier Wetland following tasks laid out by the U. S. Fish and Wildlife Service Recovery Plan for that species published in 1998.**
    Relates to Policies 1. *Protection,* and 2. *Restoration*

12. **Implement the recovery plan recommended by Kaye (2003) for Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*) and identified in Appendix 5 of the current management plan refinement.**
    Relates to Policies 1. *Protection,* and 2. *Restoration*

Alien & Invasive Species *(Appendix 6)*

13. **Implement the recommended protocols for control of reed canarygrass in the Public Use Management Unit, Wetland Prairie Management Unit and selectively in the Mixed Wetland Forest-Shrub Management Unit; implement recommended protocol for control of false brome in the Upland Management Unit.**
    Relates to Policies 1. *Protection,* and 2. *Restoration*

Hydrology *(Appendix 7)*

14. **At every public opportunity express concern for managing the Jackson-Frazier Wetland watershed to maintain or improve the current hydrological regime and water quality, suggest alternatives to damaging proposals, publicize the concern of Benton County toward maintaining a healthy wetland.**
    Relates to Policies 1. *Protection,* 6. *Education,* 8. *Connectivity,* and 9. *Off-site Partnering*

Public Use *(Appendix 8)*

15. **Recreational activity at Jackson-Frazier Wetland shall be carried out in such a manner that wetland resources are not damaged or altered. The following guidelines will ensure resource protection.**
    - Limited passive recreation is confined to the boardwalk for casual walking, light exercise, walking dogs on leash, photography, nature study, bird watching, etc.
    - Place displays along the boardwalk as educational aids
    - Inappropriate recreational activities include, but are not limited to, field sports, races, formal picnicking, and bicycling, skateboards, scooters, roller blades, motorized locomotion (except for disabled persons), hunting, trapping, and firearm use
    - Selected recreational activities will be monitored, including dog use, boardwalk condition, and other facility damage, etc.
    - Off boardwalk use is discouraged and will only be allowed with a special use permit available from the Benton County Natural Areas & Parks Department

      Relates to Policies 1. *Protection* and 4. *Recreation*

16. **Educational use of Jackson-Frazier Wetland is encouraged and will focus on formal education, including:**
    - off-boardwalk supervised field trips and class projects, professional training, educational and management activities require a special use permit available at the Benton County Natural Areas & Parks Department
    - "walk-through" field trips using the boardwalk do not require a permit
    - displays along the boardwalk will be part of the educational program for the wetland

      Relates to Policies 1. *Protection,* and 6. *Education*

17. **Research use at Jackson-Frazier Wetland is encouraged and should conform to the following guidelines:**
    - research that will help in the management and restoration of the wetland is encouraged and will be given priority
    - special use permits are required to prevent conflict among researchers, minimize damage to the wetland, and assure collection of useful data for management
    - helpful information for researchers is available from the Natural Areas & Parks staff and Technical Management Advisory Committee, and both should be contacted
    - manipulative research that might impair the resources is not allowed
    - a special use permit is required to collect plants and animals

      Relates to Policies 1. *Protection*, 6. *Education*, and 7. *Research*

Connectivity and Off-site Partnering *(Appendix 9)*

18. **Benton County Natural Areas & Parks Department should be alert to removal-fill applications and developments that might hydrologically compromise stream flow, the riparian corridor, and groundwater infiltration in the Jackson-Frazier Wetland watershed, and should comment accordingly to the City, County, or state authorities with respect to wetland protection and connectivity concerns.**

    Relates to Policies 1. *Protection*, 8. *Connectivity*, and 9. *Off-site Partnering*

19. **Explore options for acquiring and managing public lands adjacent to and west of the wetland.**
    Relates to Policies 1. *Protection* , 9. *Off-site Partnering,* and *11. Acquisition*

20. **Benton County Natural Areas & Parks Department shall work with the Corvallis Community Development Department and Corvallis Parks and Recreation Department in securing protection of the hydrological features in the wetland watershed.**
    Relates to Policies 1. *Protection,* 8. *Connectivity,* and *Off-site Partnering*

21. **Benton County Natural Areas & Parks Department shall actively promote and participate with City, County, state, and private organization efforts to develop a trail/bikeway connection between the wetland and parks and open spaces in and beyond the wetland watershed, with priority given to crossing the W&P Railroad and Highway 99W.**
    Relates to Policies 5. *Recreation,* 8. *Connectivity,* and 9. *Off-site Partnering*

22. **Benton County Natural Areas & Parks Department shall take initiative in rezoning newly acquired Jackson-Frazier Wetland areas in accordance with their wetland and protection status, and encourage the City and Greenbelt Land Trust to do likewise.**
    Relates to Policies 1. *Protection,* 3. *Management,* 9. *Off-site Partnering,* and *11. Acquisition*

23. **Benton County Natural Areas & Parks Department shall work with the City of Corvallis and Greenbelt Land Trust in developing a trail or bikeway route from the Lancaster cul-de-sac parking area to land east of Highway 99W minimizing damage to the wetland resources yet providing potential connection across the railroad and highway.**
    Relates to Policies 5. *Recreation,* 8. *Connectivity,* and 9. *Off-site Partnering*

24. **Benton County Natural Areas & Parks Department should be alert to participating in any adjacent rails-*with*-trails or rails-*to*-trails efforts.**
    Relates to Policies 5. *Recreation,* 8. *Connectivity,* and 9. *Off-site Partnering*

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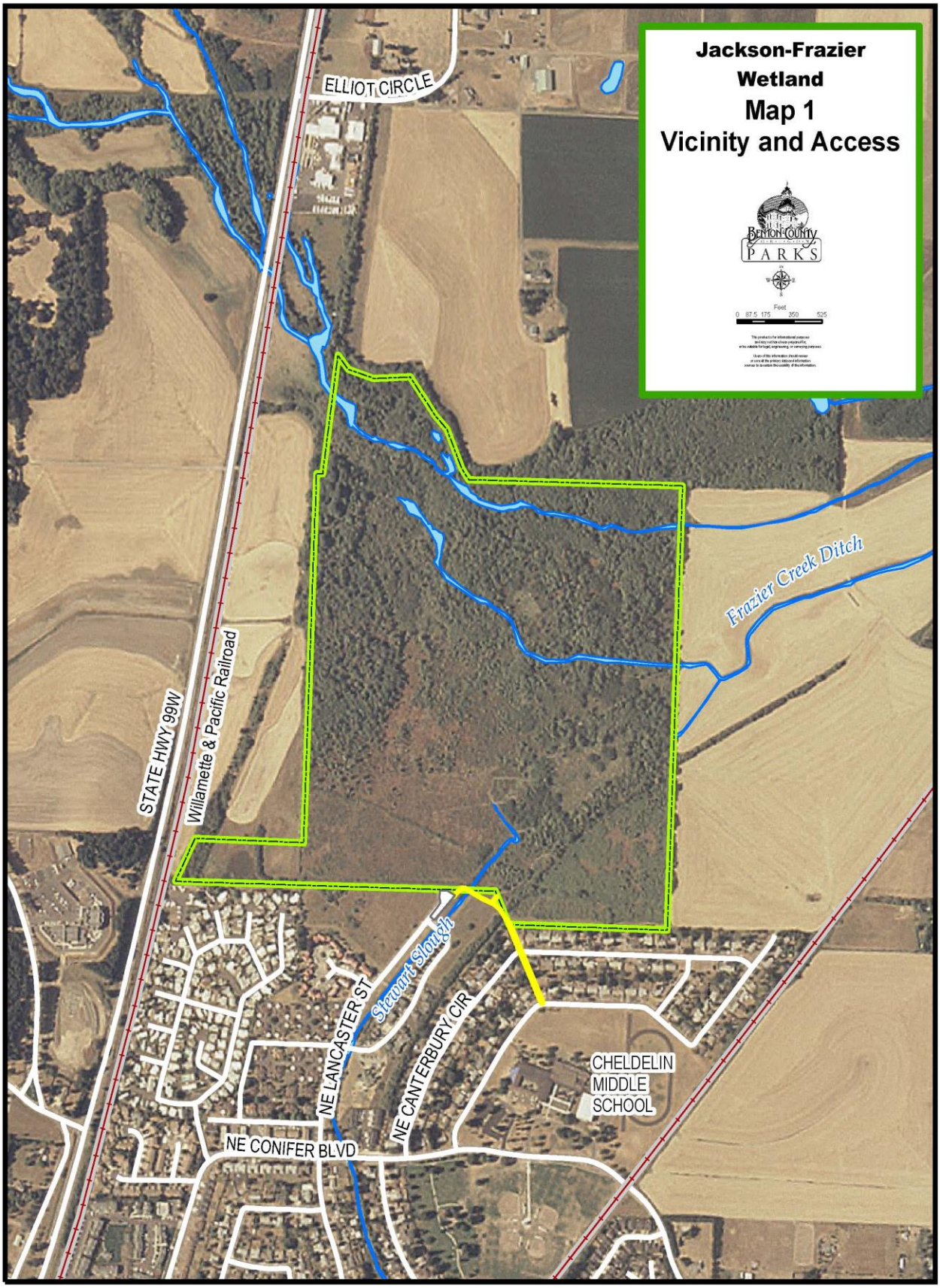
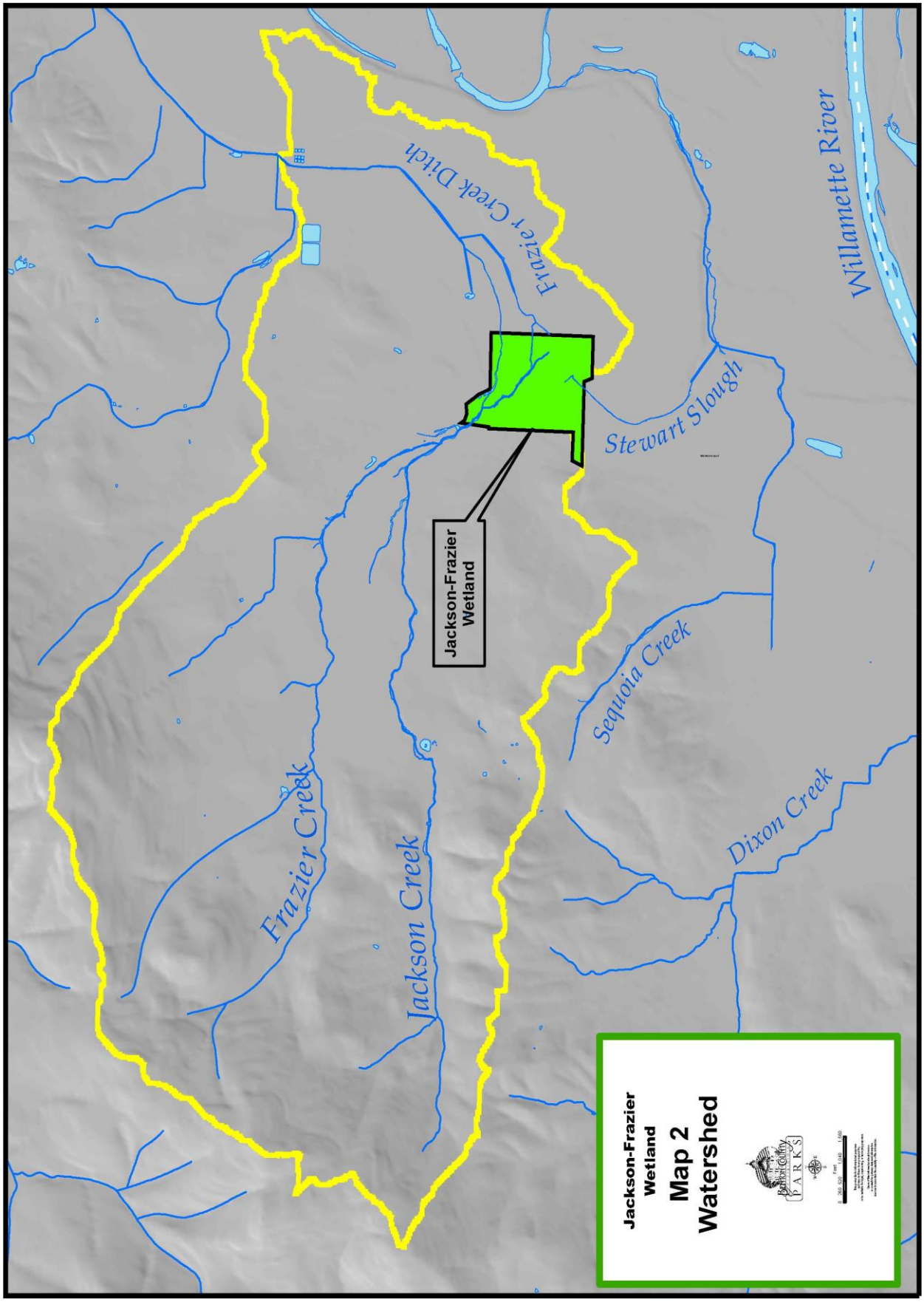
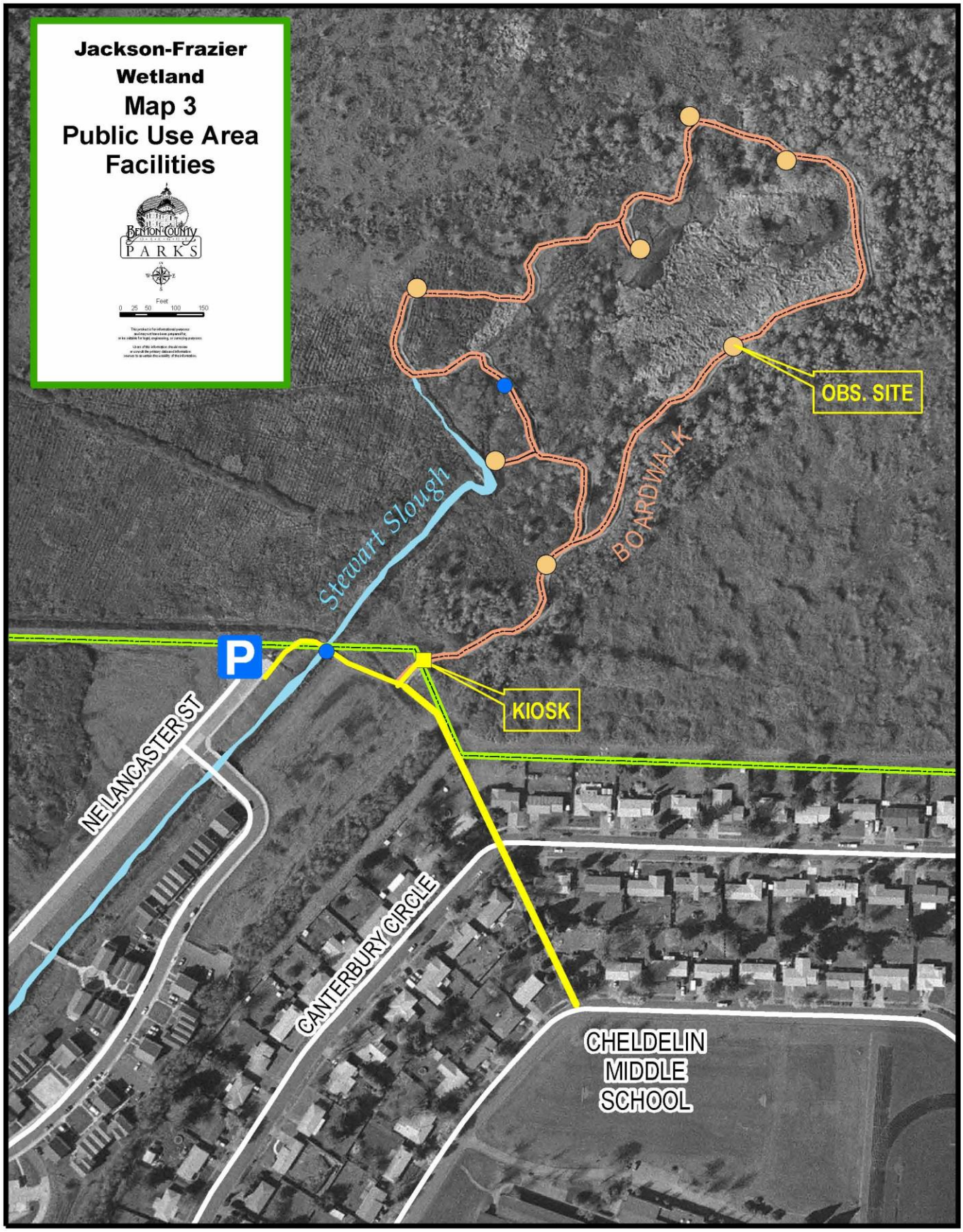
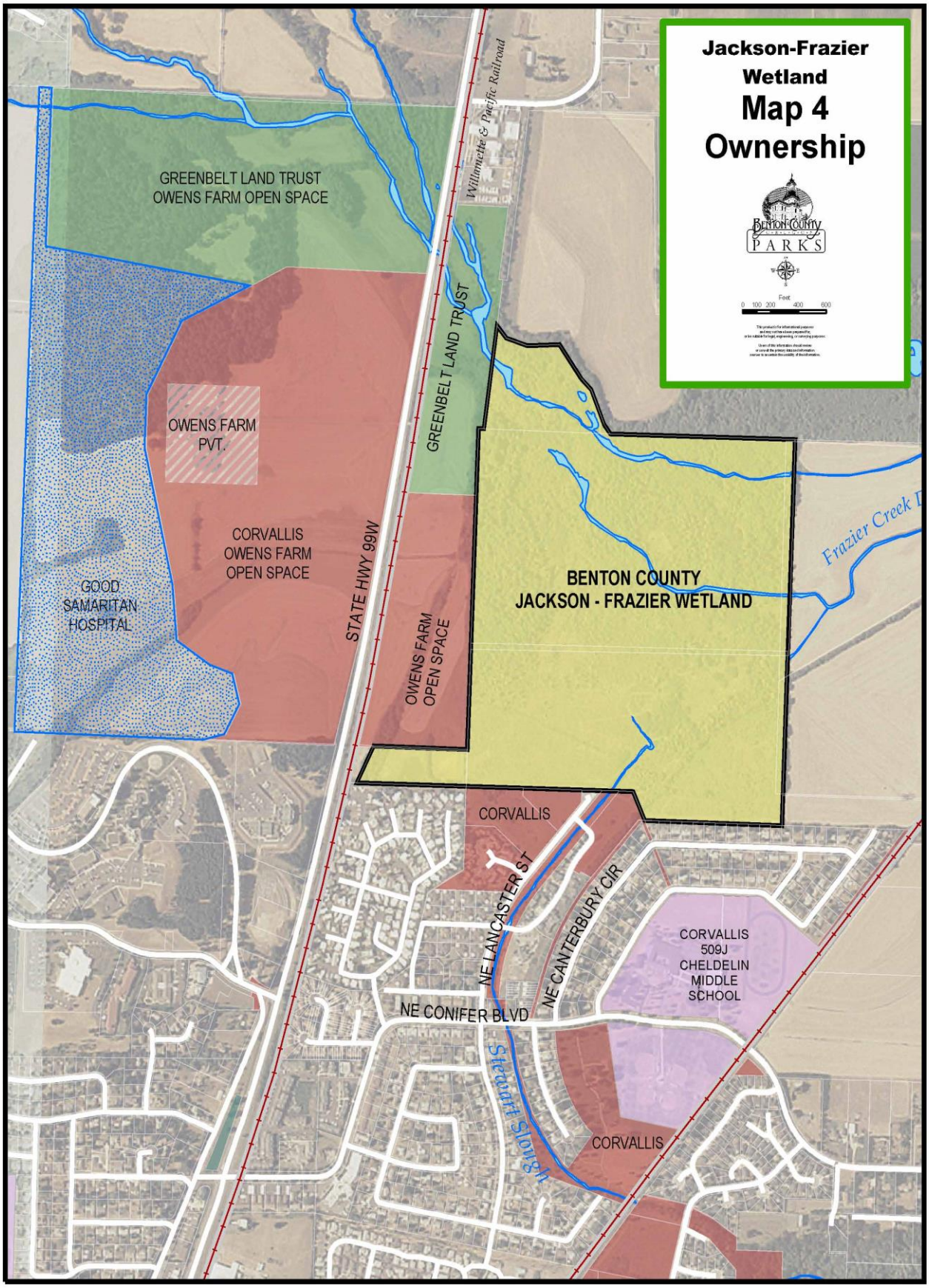
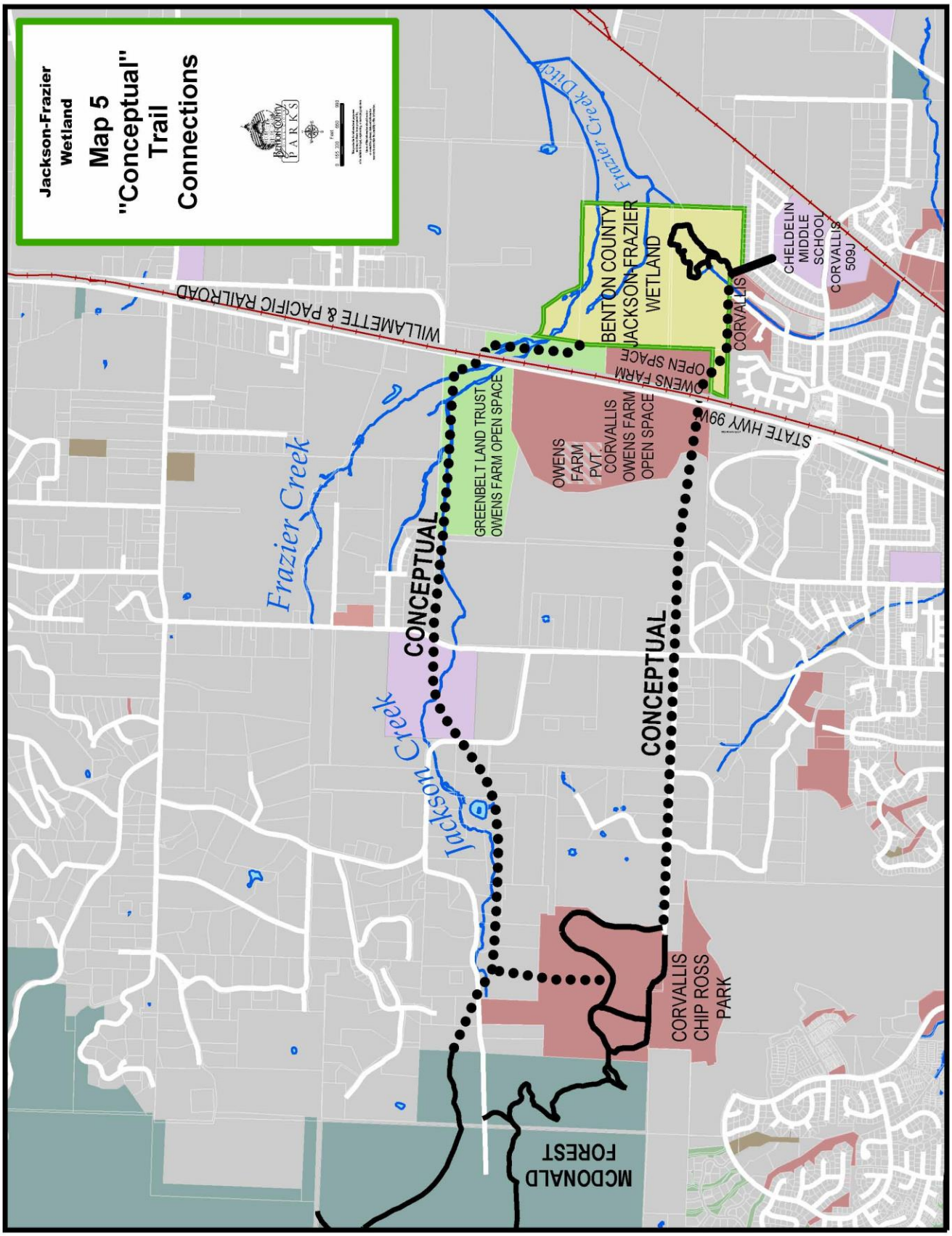
MAPS

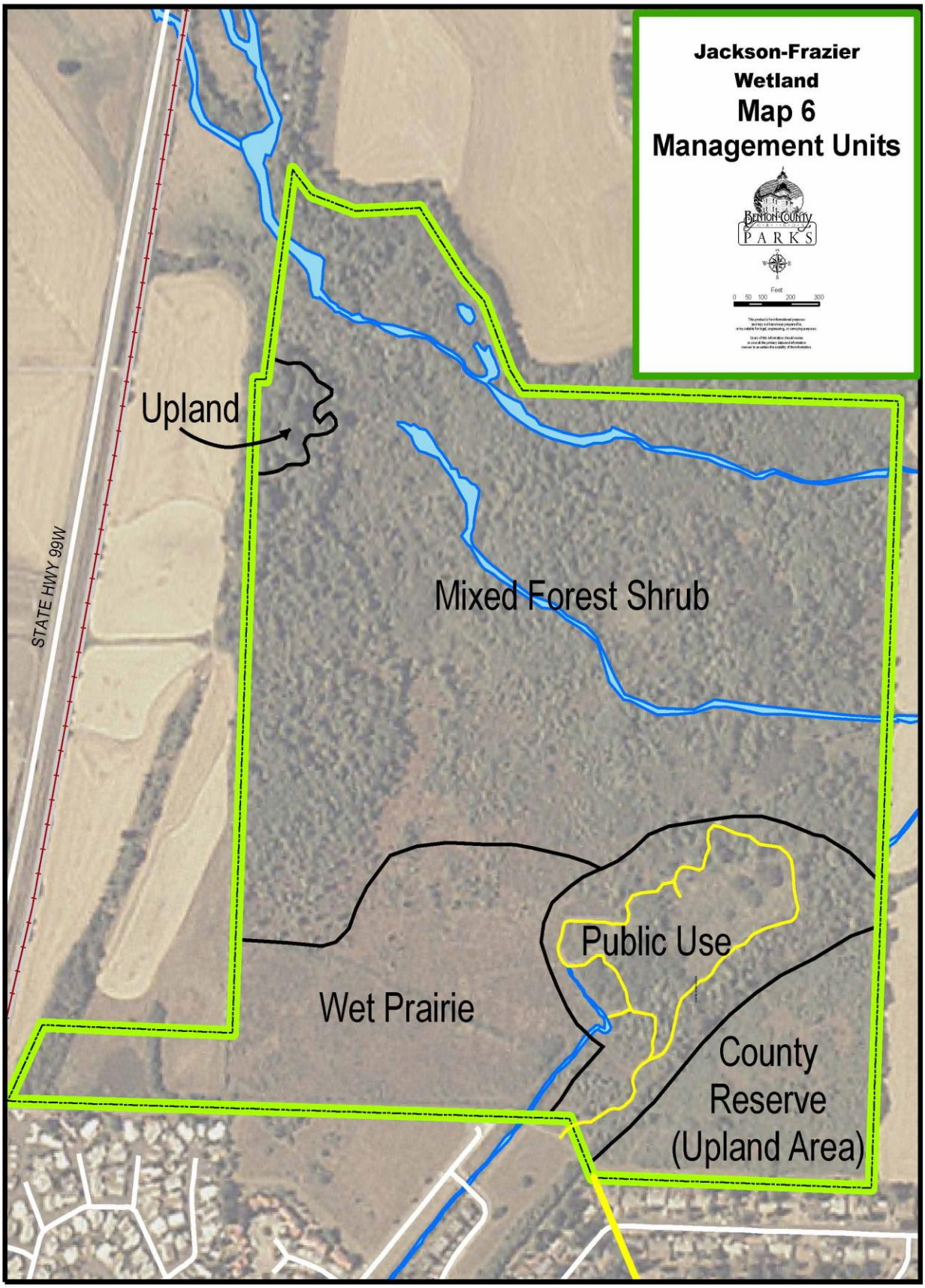

Jackson-Frazier
Wetland
Map 1
Vicinity and Access
BENTON COUNTY
PARKS
Feet
0 87.5 175 350 525
ELLIOT CIRCLE
Frazier Creek Ditch
STATE HWY 99W
Willamette & Pacific Railroad
Stewart Slough
NE LANCASTER ST
NE CANTERBURY CIR
NE CONIFER BLVD
CHELDELIN
MIDDLE
SCHOOL


Jackson-Frazier Wetland
Map 2
Watershed
Portland Parks
Jackson-Frazier Wetland
Frazier Creek
Jackson Creek
Frazier Creek Ditch
Stewart Slough
Sequoia Creek
Dixon Creek
Willamette River


Jackson-Frazier
Wetland
Map 3
Public Use Area
Facilities
BENTON COUNTY
PARKS
Feet
0 25 50 100 150
OBS. SITE
BOARDWALK
Stewart Slough
P
KIOSK
NE LANCASTER ST
CANTERBURY CIRCLE
CHELDELIN
MIDDLE
SCHOOL


Jackson-Frazier
Wetland
Map 4
Ownership
BENTON COUNTY
PARKS
Feet
0 100 200 400 600
GREENBELT LAND TRUST
OWENS FARM OPEN SPACE
Willamette & Pacific Railroad
GREENBELT LAND TRUST
OWENS FARM
PVT.
CORVALLIS
OWENS FARM
OPEN SPACE
GOOD
SAMARITAN
HOSPITAL
STATE HWY 99W
OWENS FARM
OPEN SPACE
BENTON COUNTY
JACKSON - FRAZIER WETLAND
Frazier Creek
CORVALLIS
NE LANCASTER ST
NE CANTERBURY CIR
CORVALLIS
509J
CHELDELIN
MIDDLE
SCHOOL
NE CONIFER BLVD
Shoals Branch
CORVALLIS


Jackson-Frazier Wetland
Map 5
"Conceptual" Trail Connections
Benton County
PARKS
Frazier Creek
Frazier Creek Ditch
Jackson Creek
WILLAMETTE & PACIFIC RAILROAD
STATE HWY 99W
CONCEPTUAL
CONCEPTUAL
GREENBELT LAND TRUST
OWENS FARM OPEN SPACE
OWENS FARM PVT.
CORVALLIS OWENS FARM OPEN SPACE
OWENS FARM OPEN SPACE
BENTON COUNTY JACKSON-FRAZIER WETLAND
CORVALLIS
CHELDELIN MIDDLE SCHOOL
CORVALLIS 509J
CORVALLIS CHIP ROSS PARK
MCDONALD FOREST


Jackson-Frazier
Wetland
Map 6
Management Units
BENTON COUNTY
PARKS
Feet
0 50 100 200 300
Upland
STATE HWY 99W
Mixed Forest Shrub
Public Use
Wet Prairie
County
Reserve
(Upland Area)

APPENDICES

APPENDIX 1
Administrative Documents

1. ESEE 1991 (A Revised Economic, Social, Environmental and Energy Analysis of the Jackson-Frazier Wetland, February 2, 1991), and Order M-131779-91.

2. Benton County Open Space Ordinance (Benton County Development Code Chapter 61, Opens Space (OS).

3. Ordinance Amending the Benton County Comprehensive Plan to Adopt the Jackson-Frazier Wetland Management Plan, November 20, 1992 Order M 92-0095. This ordinance accepted the Task Force recommendations including the established Jackson-Frazier Wetland as a natural area unit in the Natural Areas & Parks Department (formerly Parks Department) and the formation of a technical advisory committee.

4. Jackson-Frazier Wetland Conservation Easement with the Greenbelt Land Trust December 30, 2002 including wetland delineation report.

5. Ordinance No. 2005-0208 Accepting Jackson-Frazier Wetland Management Plan A Refinement of the 1992 Plan 2005. Zone change for additions to Jackson-Frazier Wetlands.

6. Order D2005-033 Naming the Bob Frenkel Boardwalk at the Jackson-Frazier Wetland.

A Revised Economic, Social, Environmental and Energy Analysis of the Jackson-Frazier Wet and

February 1991

This revised Economic, Social, Environmental and Energy (ESEE) Analysis responds to the Court of Appeal's reversal and remand of the Land Conservation and Development Commission's acknowledgement of Benton County's proposed protection program and ESEE Analysis for the Jackson-Frazier Wetland dated August 1988. On April 27, 1989, the Land Conservation and Development Commission granted Benton County a Continuance Order until "on or about October 30, 1990," to permit the County additional time to complete work necessary to comply with Statewide Planning Goal 5. The continuance period also coincided with the redemption period for a parcel containing the majority of the inventoried wetland resource. On October 24, 1990, the County recorded a tax collectors deed which provided for full ownership and possession of property containing 117 of the 147 acres previously inventoried as a part of the wetland.

This revised ESEE Analysis represents an update to two previous ESEE analyses prepared in November 1990 and January 1991. Revisions included in this edition were prepared in response to concerns raised at a public hearings conducted by the County Planning Commission and Board of Commissioners on December 11, 1990, January 22, 1991 and January 23, 1991. The previous editions are intended to correct the errors which resulted in the reversal and remand of LCDC acknowledgement by the Court of Appeals in Audubon Society of Portland v. LCDC (CA A43921). The County has updated background and site information to account for subsequent developments which effect the inventory of the wetland resource. This information is intended to supplement and update the information contained in the earlier adopted ESEE Analysis (November 1986). The identification of conflicting uses and the economic, social, environmental and energy consequences of the uses allowed under the current Exclusive Farm Use (EFU) zoning has been revised to eliminate any determinations on the basis of likelihood or practicability in accordance with the Court of Appeals determination. The County presents a revised Wetland Conservation Program for the Jackson-Frazier Wetland which does not rely upon state or federal regulatory programs to the extent proposed in the 1986 ESEE.

The ESEE analysis is organized in four sections. The first section - Background - provides an historical perspective of the series of planning actions concerning the wetland. The second section - Site Information - contains a summary of factual data concerning the physical characteristics of the wetland, and a qualitative and quantitative comparative assessment required by the Goal 5 Administrative Rule (OAR 660-16-000). The third section - Site Analysis - contains a continuation of the Goal 5 discussion and includes an analysis of potential conflicting uses and the economic, social, environmental and energy analysis of the conflicting uses. The final section - Benton County - describes the County's proposed protection program for limiting conflicting uses and Goal 5 protection of the resource.

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I. BACKGROUND

Previous Zoning

In November, 1968 Urban Residential zoning (RU) was placed on the area surrounding and containing the wetland. This zoning designation provided one-one acre minimum lot sizes when individual septic systems and wells were used, one-half acre minimum lot sizes when a community water system was present; and 8,000 square foot lots when both community water and sewer systems were available. In August 1974, the zoning in this area was changed to RU-3 which increased the minimum lot size to three acres.

The area was rezoned Exclusive Farm Use (EFU) as a part of extensive rezoning of the County in January 1979.

Comprehensive Plan

The area including the wetland was designated in the 1974 County Comprehensive Plan for Residential uses. The City of Corvallis had also included the area within an unofficially established city planning area. In 1977 the City lowered population projections for the year 2000 from the earlier estimate of 100,000 persons. In 1978 the City, with County input, excluded the Jackson-Frazier Wetland vicinity from the City planning area. The exclusion reflected the revised population projections and the recognized difficulty of developing in an area with such wet soil conditions. The current Urban Growth Boundary was formally established by the City and County in this area in 1980.

The Benton County Comprehensive Plan, adopted in June 1980, recognized the existence of the Jackson-Frazier Wetland in the Natural Resource and Hazards Background Report, and established policies designed to provide for the preservation of the wetland. The recognition of the site's value originated earlier with the state-sponsored Natural Area Preserve Advisory Committee and a 1977 report entitled Natural Areas and the Benton County Parks System.

In July 1980, the County Comprehensive Plan and Zoning Ordinance were submitted for acknowledgement to the Land Conservation and Development Commission (LCDC). On June 26, 1981 LCDC adopted a new administrative rule (OAR 660-16-000) which prescribed a means for evaluating Goal 5 resources. In September 1981, LCDC adopted a staff report which directed Benton County to apply the process required by the new rule to a review of the County's Goal 5 resources, including the Jackson-Frazier Wetland.

The County Board of Commissioners responded to the LCDC directive by establishing a Goal 5 Task Force charged with the responsibility of examining information on identified natural areas and making recommendations to the Board of Commissioners. The Task Force recommended to include only 14 acres of the wetland site on the natural area inventory for preservation The Board of Commissioners subsequently held three public hearings prior to taking final action adopting the Task Force recommendation, and amended the Comprehensive Plan and Background Report during March-June 1982.

In July 1982, Alan Dapp, the owner of an option on the two parcels containing the majority of the identified wetland, filed a request for a zone change and Comprehensive Plan amendment to include the area in the Corvallis Urban Growth Boundary. A hearing on the request was postponed from September 1982 at the applicant's request. Both the City and County Planning Departments had requested additional information to process the application. When information on the request was not received prior to the rescheduled hearing date, action on the request was postponed indefinitely.

In December 1982, LCDC adopted a staff report which determined the inventory and preservation program adopted by the County for the wetland to be inadequate. In December 1983 LCDC acknowledged the County Comprehensive Plan with several exceptions, one of which was the geographic area of the Jackson-Frazier Wetland. In February 1984, LCDC ordered the County to resubmit a revised preservation program for the Jackson-Frazier Wetland within 150 days.

After a request for an extension was granted, the County Planning Commission and Board of Commissioners again conducted hearings in August and September 1984 on a proposal to apply an Open Space Zoning designation to 117 acres of the wetland. The Board of Commissioners did not adopt this proposal, but instead approved a protection program which involved the proposed public acquisition of the wetland. The Board commissioned an appraisal of the site and placed a referendum on the ballot for a vote in September 1985. A tax levy for acquisition of the wetland was defeated. The subsequent LCDC enforcement order directed the County to consider four alternative approaches towards preserving the wetland. The four approaches are summarized as follows:

a) EFU zoning with restrictions limiting certain agricultural practices conflicting with wetland preservation;

b) Include portions of the property within the Corvallis UGB and place the remainder of the property in a zone which prevents conflicting uses;

c) Develop and apply a transferable development rights program;

d) Any other viable option whi .h would result in protection of the Wetland including public or private acquisition.

During late 1985 and 1986 the County researched and pursued each of these alternatives. An attempt at local public acquisition failed with the defeat of a tax levy for acquisition. Private conservation groups previously interested in the property withdrew offers to purchase the property. A transferable development rights program (Alternative C) was found to be unworkable despite attempts by LCDC members to facilitate such an approach (See 1986 ESEE for analysis which lead to this conclusion).

In September 1986 the Corvallis and Benton County Planning Commissions conducted a joint hearing on a proposal to implement Alternate B, which would include the wetland and adjacent property within the Corvallis Urban Growth Boundary and provide for development on portions of the wetland. Both Planning Commissions recommended against the proposal after hearing opposing testimony from the major property owner and many other interested parties. The proposal was dropped from further consideration. (see 1986 ESEE or decision for Planning Commission conclusions).

Alternative A provides for maintaining the wetland in an EFU zone "which permits agricultural activities, but prohibits identified conflicting uses on sensitive portions of the wetland..." At both the 1984 and 1986 hearings the Benton County Farm Bureau objected to such a solution on the grounds that the right-to-farm statutes (ORS 215.253) prohibited the County from imposing restrictions on normal farming practices. County Counsel addressed the Farm Bureau's concern to LCDC, which responded that such laws were not intended to limit or prevent the County from carrying out its duties under the statewide planning goals.

The November 1986 ESEE, which was rejected by the Court of Appeals, represented a version of Alternative A - a restricted EFU zone. However, imposing additional restrictions, the County's proposed protection program relied upon existing state and federal regulations to provide protection from agricultural uses which would otherwise conflict with the protection of wetland characteristics. The County also made an alternate argument that due to state and federal wetland regulatory programs, statements and enforcement actions by responsible agencies, it was unlikely that permits necessary to put the site into a productive agricultural use would be issued. The County also suggested that the Division of State Lands (DSL) decisions on permit applications must comply with statewide planning goals. The Court of Appeals rejected both arguments in the remand. (See Audubon Society of Portland v. LCDC (A 43921))

Property Ownership

The property containing the wetland includes three ownerships:

Owner	Assessors Map and Tax Lot Number
Robert Mix, Virgil C. Lyons, et al.	T11S-R5W-Section 13, Tax Lot 100
Thomas J. Owens	T11S-R5W-Section 13, Tax Lot 400
Benton County	T11S-R5W-Section 24, Tax Lot 500 T11S-R5W-Section 13, Tax Lot 600

The Mix-Lyons group has owned their property for a number of years. The Owens parcel has been in continuous family ownership since the original Donation Land Claim in 1851.

The County obtained title to the indicated tax lots on October 22, 1990, through tax foreclosure. The County initiated the foreclosure process on October 19, 1988 against the previous owners, Alan Dapp and Karen Anderson, pursuant to ORS Chapter 312. The previous owner had allowed approximately $25,000 in property taxes to become delinquent. The property was re-assessed for the 1987 tax year from a value in excess of $200,000 to approximately $13,000 due in part to the conclusions of the County's attempts to achieve Goal 5 compliance. For a more complete ownership history of the property now owned by the County, please refer to the 1986 ESEE.

II. SITE INFORMATION

Size/Configuration

The wetland is contained within portions of the following parcels identified by tax map and lot number assigned by the Benton County Assessors Office.

T11-R5W Section 24, Tax Lot 500
T11-R5W Section 13, Tax Lot 600
T11-R5W Section 13, Tax Lot 100
T11-R5W Section 13, Tax Lot 400 (portion of)

The four parcels form an irregularly shaped rectangle abutting the Corvallis Urban Growth Boundary and City limits on the south and Urban Growth Boundary on the west. One of the parcels adjacent to the Urban Growth Boundary and Highway 99W on the west is a portion of a larger ownership, 156 acres in size, which extends across the highway in the Urban Growth Boundary.

Location

The Wetland is located north of the Village Green area in north Corvallis, an area comprised of mixed density types of residential uses developed over the last twenty years. The wetland is located at the confluence of Jackson and Frazier Creeks, drainageways for a 3680 acre watershed that includes all of Crescent Valley and the foothills of McDonald State Forest. The wetland is east of the Southern Pacific Railroad (SPRR) line which serves communities on the west side of the Willamette River, north of Corvallis. The rail line is also adjacent to Highway 99W, an arterial highway which serves Corvallis and communities to the north and south. The SPRR line between Albany and Corvallis is to the east and separated from the wetland by a series of farm parcels. Located north of the wetland is a slight knoll and an east-west section of Elliot Circle, an access road parallel to Highway 99W. Map 1 indicates the location of the Wetland and surrounding area.

In November 1989, Scott J. Craig, a wetland consultant retained by the City of Corvallis, conducted a delineation study on an approximate six acre City owned parcel, located west of Lancaster Drive and immediately south of the inventoried wetland.

Floodplain

The Federal Emergency Management Agency's (FEMA) floodplain maps identify the area as being within the floodplain. The central and southern portions of the property at elevations of 217 feet and below are located within the AH zone (reference Map 2), an area subject to shallow flooding at depths of one to three feet in a 100 year flood.

A floodway has also been calculated by FEMA. The floodway is the area subject to high velocity waters during a one hundred year flood. The floodway is shown as existing along the defined channel entering the shallow depression where flow disperses into a sheet flow across the wetland. Testimony received at the public hearing on this revised ESEE Analysis indicated that the flood control attributes of the site would be similar under either agricultural or conservation uses.

An excerpt of the FEMA FIRM floodplain and floodway maps are identified as Maps 2 and 3.

Description of Wetland Resource

The Jackson-Frazier Wetland is recognized by scientists throughout the state and Northwest for its wetland qualities. Numerous studies and investigations have been conducted on the site. Within this section of the report a synopsis of these studies is presented in an attempt to quantify the ecological elements characteristic of the site.

A major source for this synopsis is the Jackson-Frazier Creek Wetland Impact Analysis prepared for the Division of State Lands by Scientific Resources, Inc. (SRI) in March 1986. This study was commissioned by DSL to document the extent of damage sustained by the wetland as a result of a clearing and ditching operation initiated by Alan Dapp in November 1985, and the drainage ditch constructed by the City of Corvallis in 1982.

Hydrology - SRI determined that the wetland serves as a discharge area for groundwater which permeates through the underlying geology from the higher elevations in the Jackson-Frazier Creek Watershed. Surface drainage is the primary factor in the hydrology of the wetland, however. Several inflow/outflow measurements have been made of surface water entering and leaving the wetland in the last several years. Bufkin (1985) measured the inflow into the wetland through the Jackson and Frazier Creeks at ranges of 0 to 180 cubic feet per second (cfs) and exiting the area the wetland through the Village Green Ditch on the south at ranges of 3 to 95 cfs. The Army Corps of Engineers estimated the average annual outflow from the wetland area to be 14.2 cfs. This discharge is well above the 5 cfs minimum discharge covered by Corps "headwaters" nationwide permit requirements.

SRI measured the wetland's outflow from five discharge points including three channels located in the northeast corner of the wetland. The discharge points are identified as Do1 (Village Green ditch), Do9 & Do10 (Frazier Creek ditch), Do11, Do12 and Do13 (the three outflows identified in the Northeast corner by SRI) on Map 4.

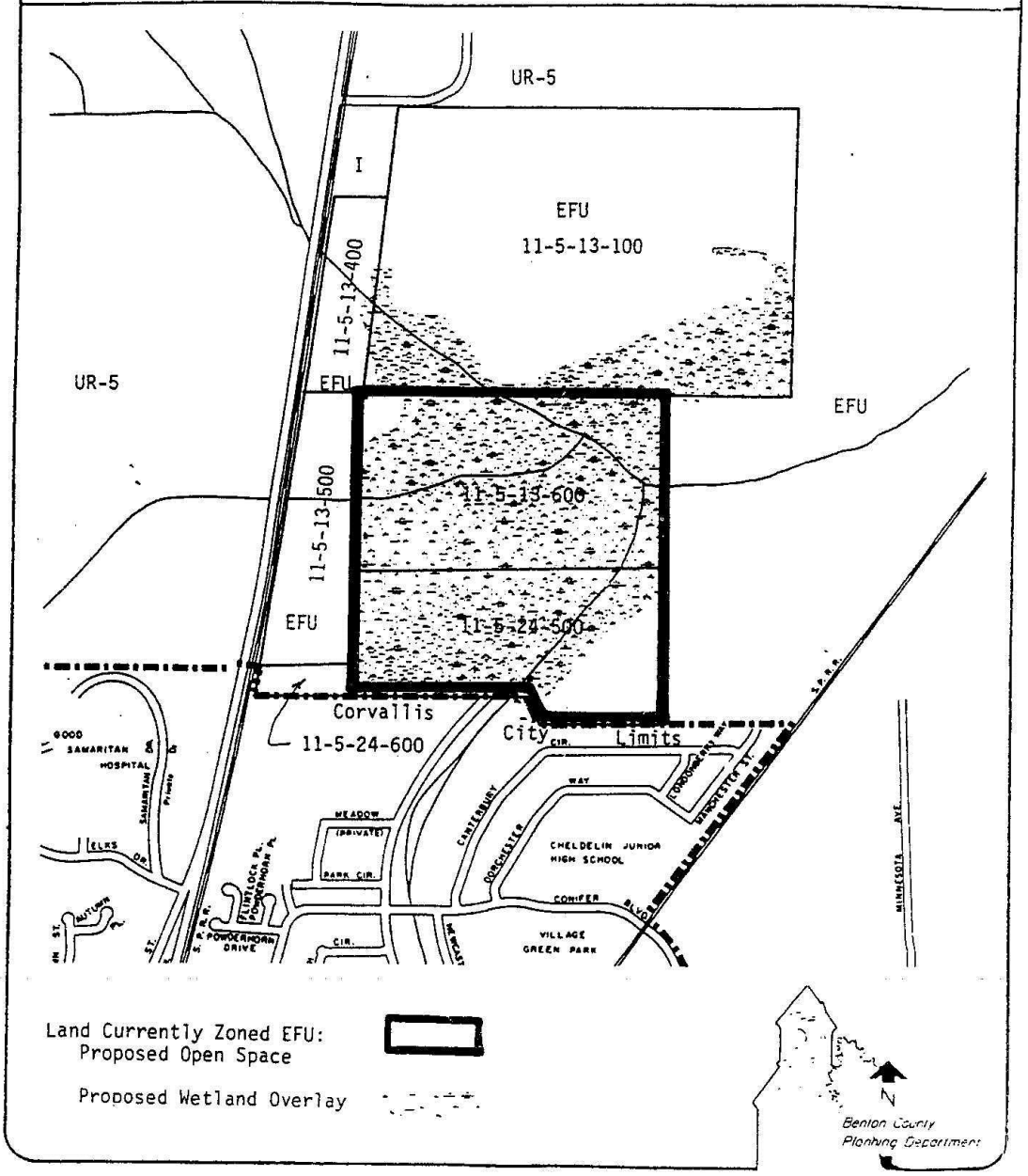
One of the more unique hydrologic elements on the site is the "vernal pond", a depression located in the southeast corner of the wetland. Investigations in 1979-80 of this area indicated that portions of the pond remain flooded from January through the first of July, longer than other areas of the wetland. Testimony received at previous public hearings assert that the vernal pond began its existence as a "man-made duck pond."

Ditching has historically occurred adjacent and within the wetland over the past fifty years (Frenkel, 1984). Studies of aerial photography reveal that linear ditches within the interior of the wetland as well as a drainage outlet which was later upgraded to the Village Green ditch were present as early as 1936. A shallow ditch in the southern portion of the wetland has also been identified on records from 1967. In 1982 the City of Corvallis excavated a deep ditch along the now southern boundary of the wetland in order to divert surface and groundwater towards the Village Green ditch and away from urban development and facilities.

Ditching was initiated by Alan Dapp, the former owner of the majority of the recognized wetland, in November 1985, without permit approval from either the Division of State Lands or the Army Corps of Engineers. As a result of SRI's investigation of the impact of these activities it has been determined that the ditching caused the diversion of surface water from the Village Green ditch to eastern flowing channels. The new channels were also found to have been preventing the flow of water to the "vernal pond" area. Water table measurements by SRI demonstrate the localized effect of the ditches in lowering the water table in the wetland adjacent to the ditches.

APPLICANT: Benton County | MAP #1 | FILE NUMBER: L 90-10

SCALE: 1" = 1,000' | **SITE MAP** | HEARING DATE:



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SRI concluded that the ditches would serve to drain the site earlier in the season and speed the movement of normally sluggish surface water, both of which would serve "to facilitate a rapid transition from wetland to upland vegetation." Restoration of the hydrologic effects of this action was the subject of orders issued by the Division of State Lands, U.S. Army Corps of Engineers and the Environmental Protection Agency in August 1986. The required restoration was completed in September 1986.

Approximately four years ago the City of Corvallis complied with a restoration order issued by the Division of State Lands in August 1986 which required backfilling and riprapping approximately 1 to 2 feet of the east-west ditch along the southern boundary of the wetland. The ditch is located approximately 50 feet north of the southern boundary of the property now owned by Benton County.

Soils - The Wetland contains six soil types with varying capabilities for a variety of uses. Table I identifies the soil types found on the property and the classifications and description of their capabilities for several uses.

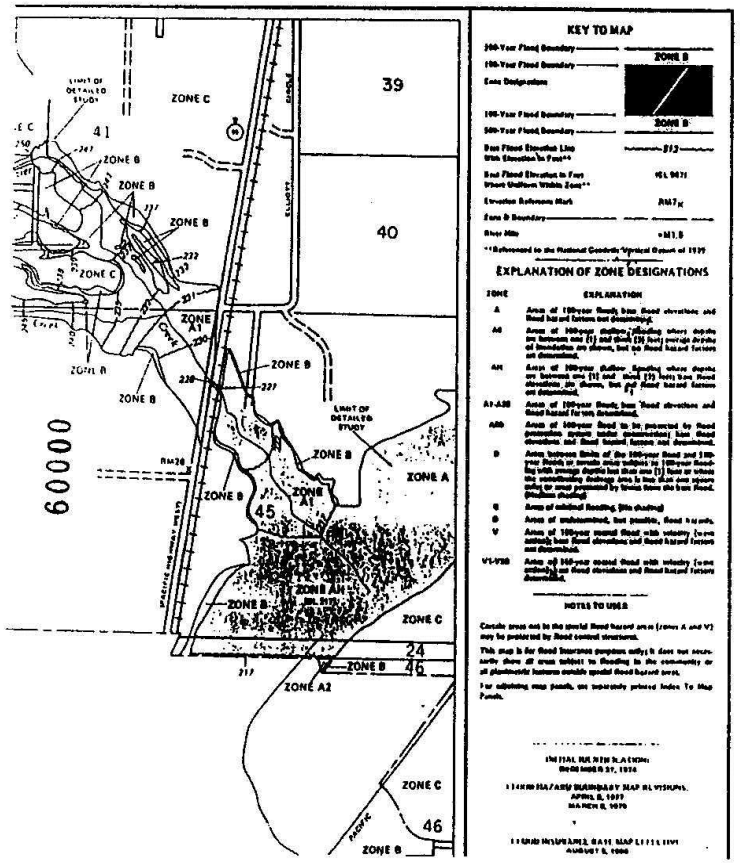
The Soil Conservation Service (SCS) conducted an investigation of the soils found on the site in response to a request to provide technical assistance. SCS revised the delineation of the soil type boundaries as reflected on Map 5.

Vegetation - Various means of classifying plant communities have been applied to the Jackson-Frazier Wetland over the history of scientific inquiry. The U.S. Fish and Wildlife Service's National Wetlands Inventory Program, the Oregon Natural Heritage Program maintained by the Nature Conservancy and a thesis (1985) by John Marshall, an OSU graduate student, each either describe and categorize the plant communities or wetlands types on the site. Map 6 and Table 2 are excerpts from Marshall's work which identify the location of wetland plant communities and associated wetland classification in more detail than previous efforts. The wetland classification is based on plant species in each community.

Documentation of the plant species found on the site was initiated by Halse and Chambers during 1978-80. Marshall and SRI made additional observations for a total of 219 identified species. Several rare plants have been previously identified on the site, including the Lomatium bradshawii, Sidalcea nelsoniana and Sidalcea campestris. In 1986, the Lomatium bradshawii population was found to be thriving despite the ditching and land clearing alterations which had occurred on the site during the previous five years (Kagan, 1986). The Lomatium bradshawii was listed as a federally recognized endangered species on September 30, 1988, by the U.S. Fish and Wildlife Service.. The Sidalecea Campestris is no longer considered a threatened plant due to its common occurrence around Linn and Benton Counties. The Sidalcea nelsoniana, which is currently under review by the USFWS, had not been observed on the site in site investigations prior to 1981 (Chambers, 1986).

At the September and October 1986 public hearings testimony was provided concerning the threat of reed canary grass (an introduced species) to the wetland. Measures to control the grass at the William L. Finley National Wildlife Refuge were noted as being ineffectual. Map 6, prepared by Marshall, indicates the range of reed canary grass limited to the emergent and forested Wetland Vegetation Communities, in the northern portion of the wetland.

In November 1989, Scott Craig, a wetland consultant, was retained by the City of Corvallis to conduct a wetlands delineation study on a six acre tract owned by the City immediately south of the Jackson-Frazier wetland. Craig's study methodology included transect sampling with control points within the inventoried wetland area 100 meters north of the



KEY TO MAP

500-Year Flood Boundary	
100-Year Flood Boundary	ZONE B
Zone Designations	
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation in Feet**	512
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7$_K$
Zone B Boundary	
River Mile	• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations, by charts, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
AR0	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (medium shading)
C	Areas of minimal flooding. (no shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard area (zones A and V) may be protected by flood control structures.

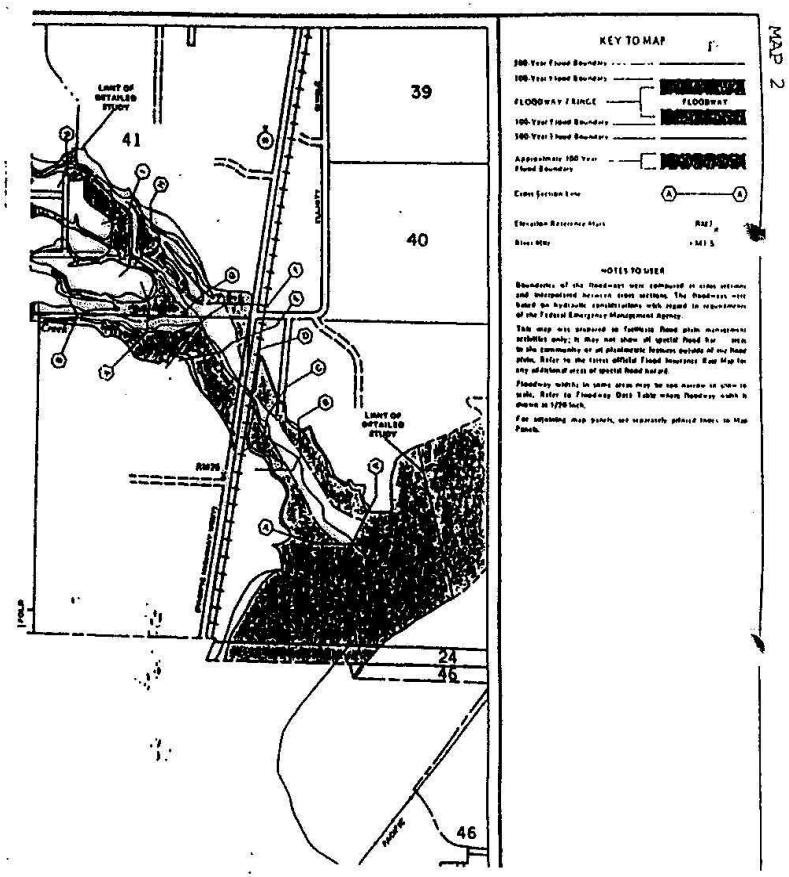
This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all plainimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL NOTICE OF FLOOD HAZARDS
DECEMBER 27, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS
APRIL 8, 1977
MARCH 8, 1979

FLOOD INSURANCE RATE MAP EFFECTIVE
AUGUST 8, 1980



KEY TO MAP

500-Year Flood Boundary	
100-Year Flood Boundary	
FLOODWAY FRINGE	FLOODWAY
100-Year Flood Boundary	
500-Year Flood Boundary	
Approximate 100-Year Flood Boundary	
Cross Section Line	A — A
Elevation Reference Mark	RM7$_K$
River Mile	• M1.5

NOTES TO USER

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

This map was prepared as FLOOD PLAIN MANAGEMENT activities only; it may not show all special flood hazard areas to the community or all plainimetric features outside of the flood plain. Refer to the latest official Flood Insurance Rate Map for any additional areas of special flood hazard.

Floodway width; in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown in 1/10 inch.

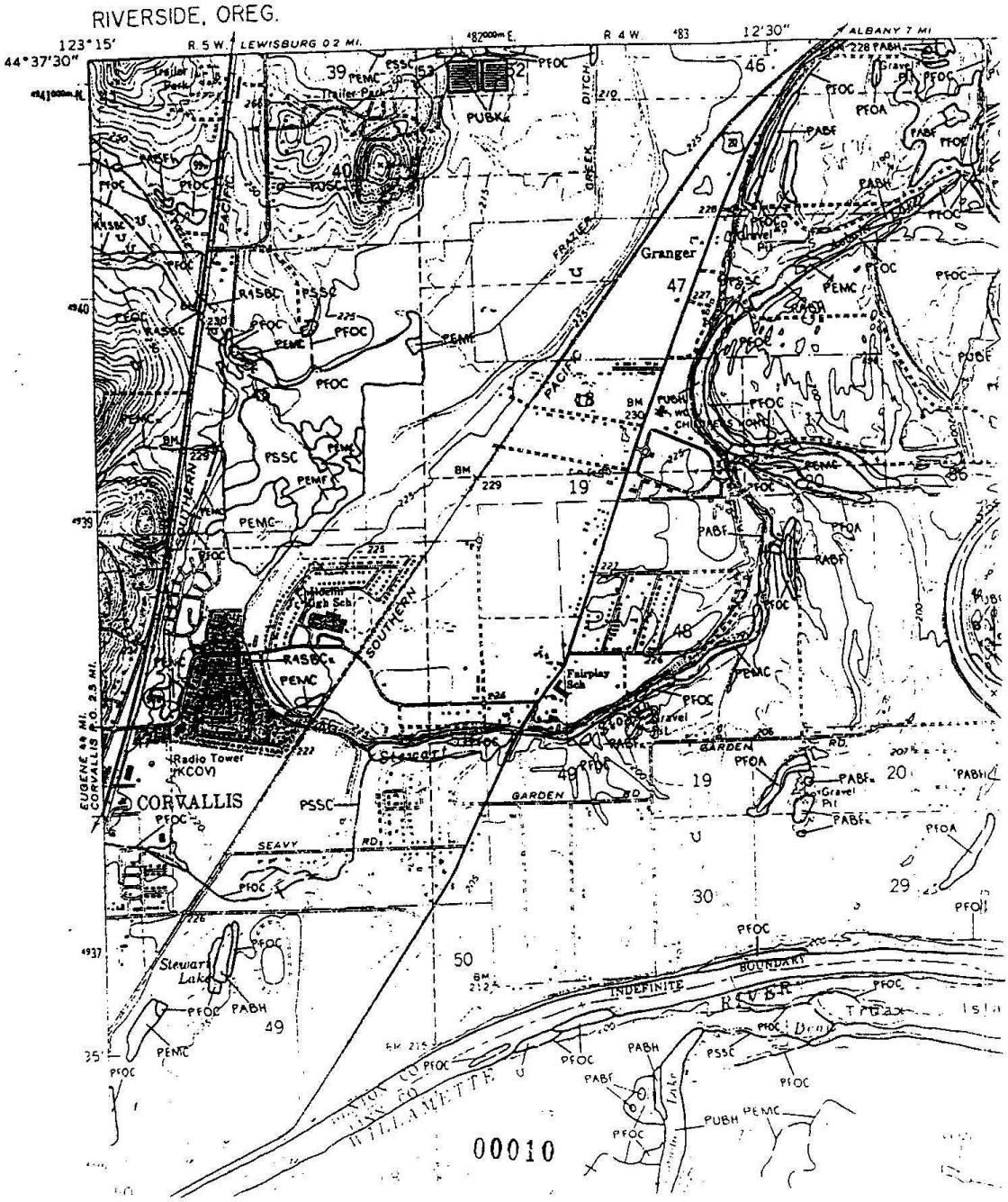
For adjoining map panels, see separately printed Index to Map Panels.

MAP 2

MAP 3

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR



MAP 4 DRAINAGE MAP

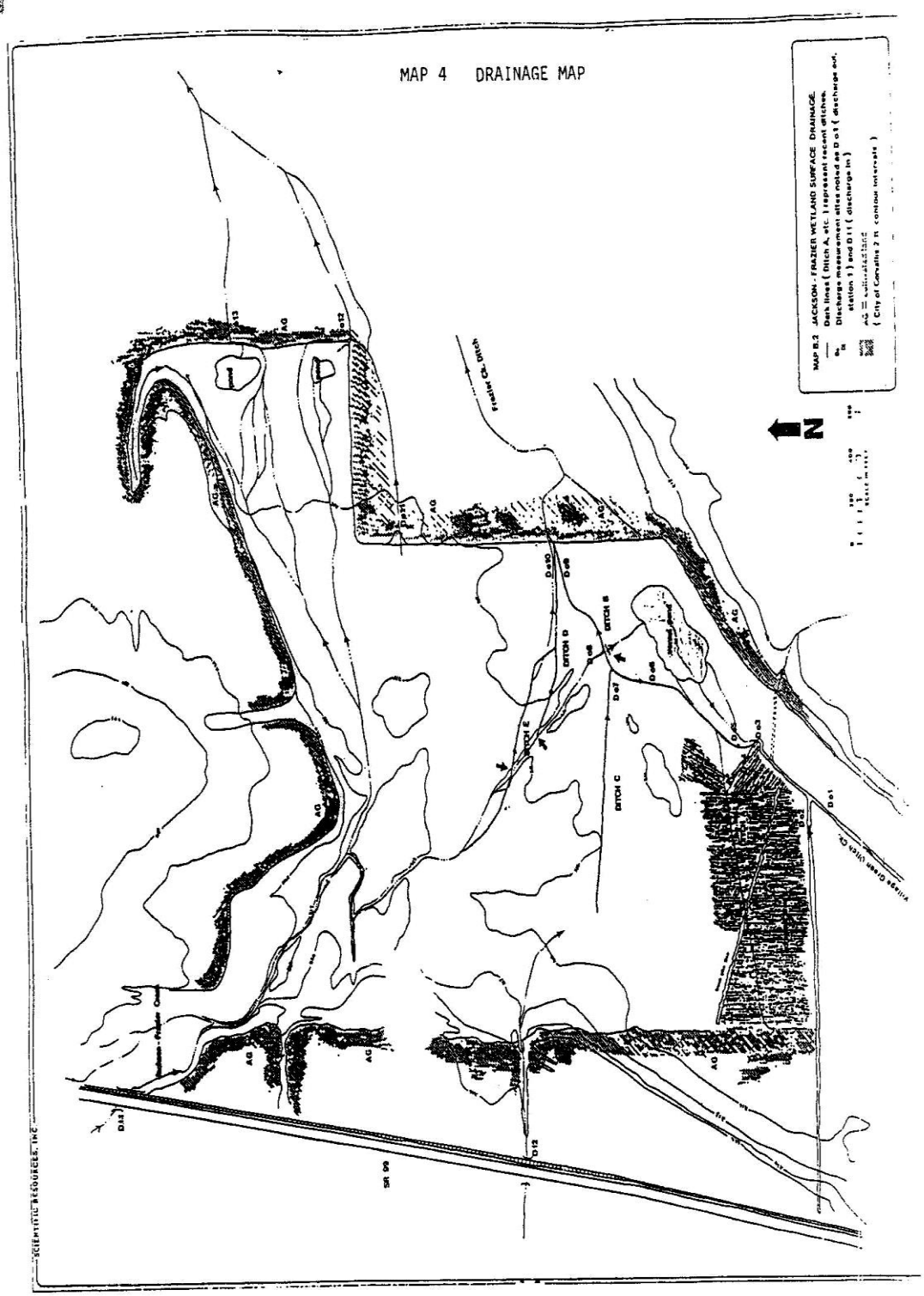


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TABLE I
SOIL TYPES
Jackson-Frazier Wetland

	DRAINAGE	EROSION HAZARD	PERMABILITY	SEPTIC TANK LIMITATION	SEASONALY HIGH WATER TABLE	AGRICULTURAL CAPABILITY CLASS	SUITABLE CROP TYPES	RUNOFF
WALDO SILTY CLAY LOAM (Wa)	Poor	Slight	Slow	Severe	Yes	III	Pasture hay, small grains, grass seed	Slow
BASHAW CLAY (Bc)	Poor	Slight	Moderate to very slow	Severe	Yes	IV	Pasture, small grains, hay	Very Slow
WOODBURN SILT LOAM (WoA)	Good	Slight	Slow	Severe	Yes	II	Pasture, small grains, hay, berries, grass seed, vegetable crops	Slow to Medium
DAYTON SILT LOAM (Da)	Poor	Slight	Moderate to very slow	Severe	Yes	IV	Pasture, hay, grass seed, grain crop	Slow to ponded
AMITY SILT LOAM (Am)	Poor	Slight	Moderately Slow	Severe	Yes	II	Small grain, hay, pasture, grass seed	Slow

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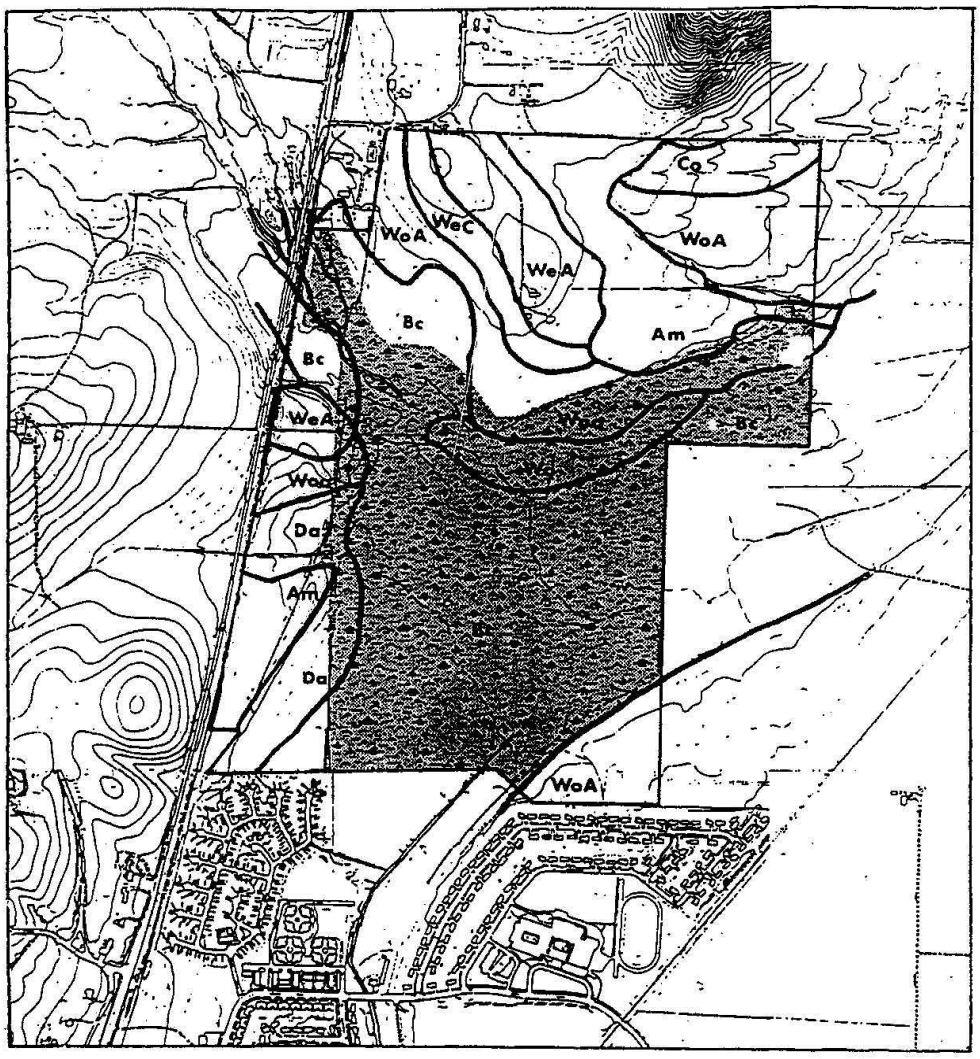
MAP 5

SOIL TYPES



Abbr.		Soil Name	Ag.Class
Am	=	Amity silt loam	II
Bc	=	Bashaw clay	IV
Da	=	Dayton silt loam	IV
Wa	=	Waldo silty clay loam	III
WeA	=	Willamette silt loam	I
WoA	=	Woodburn silt loam	II

This map was adapted from the Soil Survey of Benton County Area, Oregon, July 1975, and SCS Revision-3/86

Co	=	Concord silt loam III
WeC	=	Willamette silt loam (3-12 % slope) II

Scale: 1" = 1,000'

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Benton County Planning Department

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TABLE 2

Jackson-Frazier Wetland Plant Communities and Associated Wetland Classes. /a

Forested Nonwetland (Upland)

A *Acer macrophylum/Rubus ursinus-Rubus discolor*
(bigleaf maple/Pacific blackberry-Himalayan berry)

Forested Wetland

B *Populus trichocarpa*
(black cottonwood)

C *Pyrus-Crataegus/Rosa*
(pear and apple-hawthorne/rose)

D *Salix*
(willow)

E *Fraxinus latifolia-Crataegus/Rosa-Rhus diversiloba*
(Oregon ash-hawthorne/rose-poison oak)

F *Fraxinus latifolia/Carex obnupta-Oenanthe sarmentosa*
(Oregon ash/slough sedge-water parsley)

G *Salix-Fraxinus latifolia/Carex obnupta-Phalaris arundinacea*
(willow - Oregon ash/slough sedge-reed canary grass)

Scrub-Shrub Wetland

H *Fraxinus latifolia/Rosa/Carex obnupta-Oenanthe sarmentosa*
(Oregon ash/rose/slough sedge-water parsley)

I *Fraxinus latifolia/Rosa-Spiraea douglassii/Carex obnupta-Juncus effusus*
(Oregon ash/rose/hardhack/slough sedge-rush)

Emergent Wetland

J *Rosa/Oenanthe sarmentosa*
(rose/water parsley)

/a The TABORD and CLUSTER computer programs were used in conjunction with field observations to determine plant communities. The disparity in number results largely from an inadequate number of samples. Image units that qualified as distinct communities were often inadequately represented in the programs and their samples contributed to a reduction in the integrity of clusters.

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TABLE 2 (con't)
(Continued) Jackson-Frazier Wetland Plant Communities and Associated Wetland Classes.

Emergent Wetland (Continued)

K *Eleocharis palustris-Carex unilateralis*
(spike rush-one sided sedge)

L *Eleocharis palustris-Mentha arvensis*
(spike rush-mint)

M *Pyrus-Crataegus/Hordeum brachyantherum-Deschampsia cespitosa*
(pear and apple-hawthorne/meadow barley-tufted hair-grass)

N *Carex obnupta-Juncus effusus-Typha latifolia*
(slough sedge-rush-cattail)

O *Salix/Phalaris arundinacea-Carex obnupta*
(Willow/reed canary grass-slough sedge)

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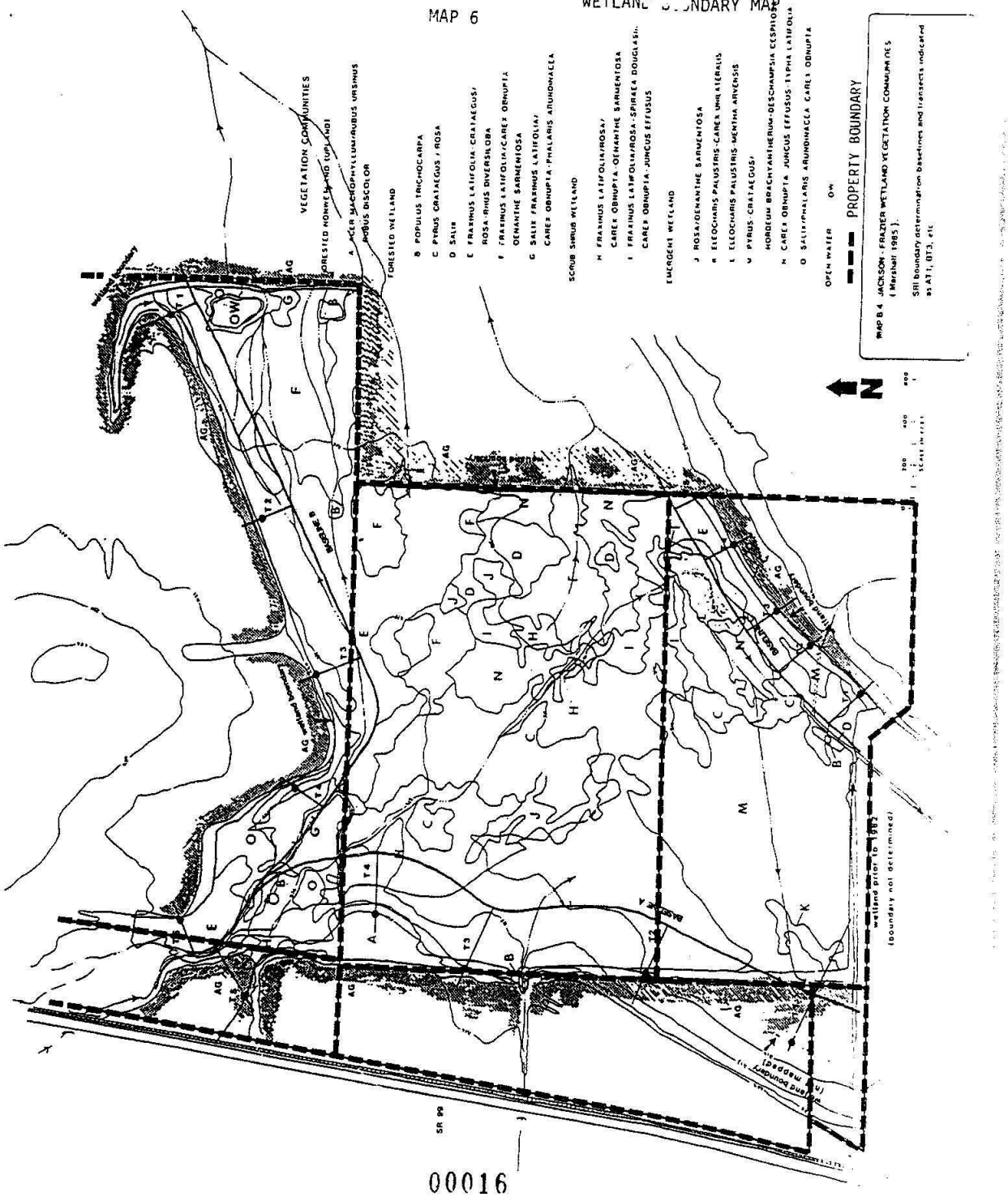
VEGETATIVE COMMUNITIES/
WETLAND BOUNDARY MAP

MAP 6



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east-west modified ditch. Four control plots within the wetland identify a a number of obligate wetland, facultative wetland and facultative species with percent cover ranging from 70 to 100. Scott did not identify the continuing presence of the Lomatium Bradshawii due to the time of the study. Lomatium Bradshawii flowers early in the growing season and quickly retreats to dormancy. Subsequent investigations in the spring of 1990 revealed the presence of the plant on the City owned Lancaster tract. The continued presence of the plant north of the ditch is also likely.

In accordance with the methodology provided for in the Federal Manual for Identifying and Delineating Wetlands (1989), the Scott study concludes that the southern portion of the wetland maintains wetland characteristics. The Manual defines wetlands as including areas with hydric soils with identified hydric vegetation with an excess of 50% coverage.

Thirteen acres in the southern portion of the wetland were scraped by a bulldozer with a brush blade as a part of the wetland alteration in November 1985. This action removed the shrubs and other woody vegetation while leaving as much as 65% of the herbs, forbs and grasses in condition for recovery during the growing season, according to SRI's estimate. Observation of the scraped area indicates that most of the affected area has recovered from compaction.

Wetland Boundary Determination - SRI delineated the boundary of the wetland using an accepted scientific procedure which considers the presence of wetland plant communities, wetland soils and wetland hydrology. Through a systems of baselines and transects, the point where upland vegetation was observed was noted and mapped as indicated on Map 6. The Division of State Lands, the Army Corps of Engineers and the Environmental Protection Agency have used this boundary determination as a basis for defining regulatory jurisdiction.

The wetland boundary map provides for a determination of the location and extent of the Goal 5 Resource.

Qualitative and Quantitative Assessment

The Goal 5 inventory process requires that a determination of the quality of the resource be made relative to other examples of the same resource within the jurisdiction. The William L. Finley National Wildlife Refuge is the only area within the County containing wetland prairie and associated shrub and forested wetland communities. Testimony submitted to the Board of Commissioners in March 1982 indicated that of the Refuge's 5,324 acres, approximately 400 acres are comparable to the Jackson-Frazier Wetland. The Finley Refuge Wetland complex results from a different geologic history laying on Willamette silts deposited more than 20,000 years ago. The Jackson-Frazier Wetland contains clay alluvium soils originating from the hills above and deposited over the Willamette silts some 5,000 years ago. The soils of the Finley Refuge wetlands are primarily Dayton Silt Loams, a coarse texture soil with an underlying hardpan. The Jackson-Frazier Wetland is primarily Bashaw clay, subject to a high shrink/swell. Because of the different soil conditions, water levels at Finley were reported to rise and drop faster than at Jackson-Frazier.

The Jackson-Frazier Wetland is generally flat with little natural relief. Due to the sedimentation and erosion patterns at Finley, a corrugated surface with slight lens shaped hills one to two feet in height exist.

Neither wetland has been subject to plowing; therefore, alterations to natural conditions have been minimized in both (Sekora, 1982; Frenkel, 1984). Both wetlands have been

subject to the introduction of non-native plant species (Sekora, 1982; SRI, 1986). Two native plant species, Lomatium bradshawii and aster ballii are found on both sites. These plants are rare and either eligible for Federal endangered status or already protected. The Lomatium bradshawii is found in the second largest concentration in the Jackson-Frazier Wetland. Large, more dense concentrations are found in Lane County. Observation of the Lomatium bradshawii at the Finley Refuge revealed a more delicate and limited Lomatium bradshawii population (Kagan 1981).

The Jackson-Frazier Wetland also has a greater significant diversity of vegetation not found at the Finley Refuge's wetland. Fourteen distinct plant communities have been cataloged within the Jackson-Frazier Wetland (Marshall, 1985). Only four plant communities have been identified within the Finley Refuge Wetlands.

Wildlife habitat values are also present on both the Jackson-Frazier and Finley Refuge Wetlands. Finley is managed primarily as a habitat for the Dusky Canadian Geese and secondarily for other resident wildlife. While the relative degree of concentration of wildlife in the two areas are not known, the range of habitat at Finley is much more extensive given the 5,300 acre size of the refuge, as well as adjacent farm and forest lands. The urban and intensive agricultural uses immediately surrounding the Jackson-Frazier Wetland diminish the significance of wildlife habitat values. Department of Fish and Wildlife Officials note that the Jackson-Frazier wetland's wildlife habitat values are similar to other riparian areas found throughout the Willamette Valley.

The intentional management of the Finley Refuge Wetlands, including a prescribed burn program, has been ongoing since 1973 . The Willamette Floodplain Research Natural Area on the Refuge was established to preserve the examples of wet valley-bottom habitat. The Jackson-Frazier Wetland had not been subject to any management activity since the abandonment of cattle grazing in the late 1950's until the attempts to drain the property were initiated by the property owner in November 1985, and the City of Corvallis in 1982. The Nature Conservancy recognized the need for early management measures, including "the removal of young orchard and ash trees that are encroaching...". Testimony by two botany experts at the October 1986 hearings also indicated a need to introduce management measures to control the succession of woody vegetation. The lack of intentional wetland preservation management is recognized as a continuing threat to the preservation of significant wetland values.

A determination of the quantity of the resource requires the consideration of the relative abundance of wetland resources. The Jackson-Frazier Wetland contains 147 acres, and although smaller than the 400 wetland acres on the Finley Wildlife Refuge, is one of the larger intact wetlands remaining in Benton County and the entire Willamette Valley.

Inclusion on Plan Inventory

The information referenced in this section of the report clearly documents the significance of the Jackson-Frazier Wetland. Map 6, which is based on an investigation conducted by Scientific Resources Incorporated for the Division of State Lands, accurately indicates the location and extent of the resource subject to state and federal agency jurisdiction. The County Development Department has calculated the distribution of the wetland resource among the following tax lots from the wetland boundary map prepared for the Division of Lands.

	Total Acreage	Wetland Acreage
T11-R5W Section 24, Tax Lot 500	54.71 acres	39.5 acres
T11-R5W Section 13, Tax Lot 600	75.91 acres	72.4 acres
T11-R5W Section 13, Tax Lot 400 (portion of)	12.00 acres	0.7 acre
T11-R5W Section 13, Tax Lot 100	154.35 acres	34.7 acres

The Land Conservation and Development Commission has issued, "in order to comply," requirements which instruct Benton County to amend the plan "to clearly recognize the significance of the Jackson-Frazier Wetland".

The identified significant features of the wetland are determined to be:

The Wetland hydrology including the vernal pond, flooded and seasonably flood portions of the site and the inflow and outlets of the wetland.

The diversity and combination of plant species as characterized by the fourteen plant communities and 219 plant species identified on the site and associated natural area and scientific values.

The deschampsia prairie found on the southern portion of the site.

The relatively undisturbed and intact character of the wetland.

The size of the wetland and its recognition as one of the last remaining wetland tracts of such a size in the Willamette Valley.

The presence of the Lomatium Bradshawii a rare plant listed as an endangered species by the U.S. Fish and Wildlife Service and found in only a few locations in the Southern Willamette Valley.

Other features of the site have been identified within this and previous analysis are determined to be of lesser significance and not particularly unique to the wetland or the protection of significant wetland features. These features include wildlife habitat values, flood storage, the geology/topography of the site, and the forested portion of the wetland.

Testimony submitted in response to the 1986 ESEE analysis suggests that a separate analysis of natural area values should be undertaken. The County finds that the natural area resource values are inextricably associated with the wetland characteristics and identified significant wetland features.

Natural succession was suggested to be compatible with natural area values. Most experts consider natural succession to be a threat to wetland values. Natural succession is a part of wetland dynamics. The rate at which natural succession occurs can be controlled through management measures. A management approach which intentionally or otherwise provides for wetland preservation does not necessarily diminish the future natural area values. Previous testimony by scientists and conservation managers indicates that the particular wetland values identified above are in fact more significant than the natural processes which threaten them. The ability to observe natural processes is now available on the portion of the site which is under County ownership or by permission of the other

adjoining property owners. Goal 5 and associated Administrative Rules due not, however, require either public access or specific prescriptive management measures to maintain a particular set of values. The County interprets Goal 5 as requiring either limiting or prohibiting conflicting land uses.

The County is sensitive to the need to develop and implement a specific management plan which would identify in further detail values to be preserved on the site, the threats to the values resulting from other than on-site land use decisions, opportunities, and maintenance measures necessary to preserve significant values. As the owner of 112 acres of the wetland, the County proposes to consider the preparation of a Specific Management Plan in a subsequent fiscal year. The plan preparation process would provide for the involvement of interested and knowledgeable persons to participate in establishing a policy for the management of the wetland. The proposed Specific Management Plan would be consistent with the following Goal 5 conclusions.

The wetland, as indicated on Map 6, shall be made a part of the County's Goal 5 inventory in compliance with the LCDC order and Goal 5 requirements.

III. SITE ANALYSIS

The Goal 5 Administrative Rules requires that the county "identify conflicts with the inventoried Goal 5 resource sites. This is done primarily by examining the uses allowed in broad zoning districts established by the jurisdiction" (OAR 660-16-005). The inventoried resource site is zoned Exclusive Farm Use. A review of uses which are permitted outright, or subject to review under a conditional use permit was conducted to determine which uses, if any, represented a conflict "which could negatively impact a Goal 5 resource site." The County is limited the review of potential conflicted uses to the inventoried resource site.

Farm Use

The County's Exclusive Farm Use zone permits farm use as an outright permitted use in accordance with state statute. The statutory definition of farm use is broadly inclusive so as to include a variety of agricultural practices. The County has reviewed a number of these practices in an attempt to determine if farm use is a conflicting use.

Drainage - Raising crops requires varying degrees of site preparation, depending upon the type of crop to be cultivated or managed. Because of the seasonal flooding to which the wetland area is subject, drainage improvements would be required to provide for efficient production of selected crops. The Benton County Soil Survey identifies the need to provide drainage for maximum use and production for the Waldo and Bashaw soils found in the wetland. Establishment of suitable drainage outlets is identified as a problem with these soil types. Attempts to drain the wetland in order to establish an agricultural use in late 1985 were analyzed by consultants to the Division of State Lands and were determined to be detrimental to the wetland. The SRI report concluded: "The ultimate effect of recent alteration will be to facilitate a rapid transition from wetland to upland vegetation as soils are dewatered from ditching drainage."

Land Clearing - In order to place the property into a managed agricultural use the native and other vegetation presently found on the site would have to be removed from the site. The more common method of land clearing involves the use of a tractor or bulldozer which strips vegetation and organic matter found in the surface soil horizons from an area. The owner of the majority of the wetland property initiated such an activity on 13 acres of the wetland as a part of the disturbances in late 1985. The SRI report on the disturbance documented a loss of 35% of the vegetation in the 13 acre area as a result of compaction within the tracks of the bulldozer. Woody vegetation was removed between the tracks and scraped into a brush pile. Remnants of grasses, forbs, and herbs remained however. Observations later in the growing season indicated that more than 50% of the area compacted had recovered from the disturbance. Soil compaction restricted vegetation growth in the cleared area however. The clearing activity substantially controlled the encroachment of woody vegetation into the deschampsia prairie.

Herbicides - The use of herbicides is a common agricultural practice which is typically allowed in the EFU zone. Herbicides are normally used as a control measure in sustaining an established mono-culture use. Aerial application is the most cost-effective method of spraying an area the size of the wetland. Herbicides must be applied by state licensed applicators according to labeled instructions. The Oregon Department of Agriculture administers regulations (OAR 603-57-000) approved by the Environmental Protection Agency which controls the use of herbicides.

A variety of selected herbicides was considered in analyzing the effect of herbicides on the wetland's plant communities. After consultation with licensed herbicide applicators, state pesticide inspectors, and other agriculture experts, glyphosate was determined to be the herbicide of likely choice. This herbicide, under the brand name Rodeo, is labelled for use in an aquatic environment. Glyphosate enters the plant through the foliage; therefore, the instructions recommend that the weed targeted for control be sprayed when it reaches maturity. The effectiveness of the compound is significantly diminished when the plants are not sprayed at maturity. The label also notes that "Unemerged plants arising from unattached underground rhizomes or root stocks of perennials will not be affected by the spray and will continue to grow." While there may be stronger more toxic herbicides available, regulators and experts in this field stated that due to the circumstances surrounding the wetland including flooded conditions and the proximity of adjacent development, the only herbicide which would qualify for use would be glyphosate.

Three separate botanic surveys of the Jackson Frazier Wetland (Halse/Chambers, 1980; Marshall, 1985; SRI, 1986) identified 219 separate plant species within the wetland. In order to control this many plant species, numerous properly timed applications would be required in order to produce an appreciable impact. Testimony provided on an earlier draft of this report indicated that 20 dominant plant species comprise 80% of the wetland's vegetation, many of which mature around the same time. The point raised is that a properly timed application could have serious effects on the wetland's vegetation. The remaining 199 plant species have different life-cycles and therefore would require multiple spraying for effective control. The dominant plant species, many of which are perennials, would recover even if spraying were attempted.

OSU Extension Specialists report that the precise effect of spraying glyphosate or any other herbicide on the 219 plant species cannot be readily determined. Many of the plant species have never been researched to determine their tolerance to common agricultural herbicides.

Field burning - Field burning during the dry summer months is a normal agricultural practice in the Willamette Valley. Fire suppression has created the encroachment of orchard and native trees and shrubs into the deschampsia prairie, which contains some of the most significant wetland values. The Nature Conservancy proposed to initiate early management steps to remove these young trees when it was attempting to acquire the property. Testimony was submitted during public hearings on this ESEE noting the need to reintroduce fire at an average interval of 5-10 years in order to reverse the encroachment of trees and the accumulation of plant material.

Plowing and tilling - Plowing and tilling of the wetland vegetation in order to engage the area in the cultivation of selected field crops would be particularly detrimental to the rare native plants found on the site (Frenkel, 1984). The area has never been plowed and is relatively undisturbed. This wetland quality would be lost by such an activity. The furrows created by plowing or tilling would be devastating to the majority of the native plant species. Reemergence of many of the plants would be likely, particularly in the absence of drainage improvements. Some plants pre-adapted to disturbed ground could potentially invade the wetland. The most significant effect of plowing and tilling would be the damage to the undisturbed quality of the wetland.

Introduction of non-native species - The introduction of non-native species is a standard agricultural practice. Non-native species of grasses for forage or seed production could be introduced into the wetland through broadcast application without tilling. Such a farming practice would not provide an economic return, however. Economically feasible crop cultivation can only occur if the site is drained, cleared and plowed.

Many of the forage and grass seed species commonly used in commercial agriculture including fescue, rye, bent, timothy and blue grasses are already found within the wetland (Halse-Chambers 1980). Of the 29 species within the grass (Graninae) family identified within the wetland, 12 are not indigenous to the area.

The enhancement or restoration of wetland values might involve the introduction of wetland plant species, or the alteration of the hydrologic regime to the extent that existing species could be threatened. A scientific study of the wetland should be conducted to determine what, if any, enhancement measures would be constructive. Selected management measures would likely produce a beneficial effect on wetland values.

Harvesting of silage - This management practice could be initiated in an attempt to derive some value from the grasses thriving within the deschampsia prairie. A variety of grasses and other herbs and forbs exist within the prairie, reducing their value for hay. Shrubs and small trees within the wetland prairie would also make such a management practice difficult. Reducing the buildup of biomass through mowing and harvesting would be beneficial by promoting new grass growth. Harvesting of hay typically occurs in the dry summer months; therefore, no soil compaction impacts would result. Testimony submitted indicates wild hay has been previously harvested with no known negative impact.

Livestock Grazing/Boarding of Horses - The Jackson-Frazier wetland was grazed by livestock until the late 1950's. The encroachment of shrub thicket onto the deschampsia prairie in the southern portion of the wetland has been related to the removal of cattle grazing. (Frenkel, 1982). Livestock often forage for the shoots of emerging shrub plants, and therefore, can effectively control emerging woody plants (Day, 1986). The encroachment of woody vegetation has been identified as a threat to significant wetlands values present in the deschampsia prairie (Nature Conservancy Starker Proposal, undated).

An unimproved pasture which is seasonably flooded could be used for livestock grazing (Day, 1986). Management of the timing of stock grazing with conditions in the wetland would be necessary in order to facilitate the sustained health and growth of the livestock. Pasture conditions are optimum from April through July in the Willamette Valley; therefore, the prime grazing season coincides with this period. Forage production during August and September is reduced; and therefore grazing is usually also reduced during this period. Some fall forage could be grazed until the end of the growing season in November. These typical pasture management practices would need to be adjusted to specific conditions, notably standing water and saturated soils. Because of the marginal pasture values, the livestock manager would have to carefully monitor site conditions in order to avoid significant harm to the wetland pasture, thereby diminishing its productive values and in order to assure a healthy environment for rapid gains in a cattle operation, or wool production in the case of sheep.

The most obvious risks to the use of the wetland for pasture is soil compaction caused by the animals sinking into the soil under saturated and flooded conditions. Random compaction throughout the grazed area and concentrated compaction along animal trails could result as noted in earlier observations (Frenkel, 1982). The Soil Conservation Service notes that although the wetland's silt-clays are slightly resilient in recovering from compaction through the drought/saturation cycle, the evidence of compaction remains a noted landscape feature. Since the level of soil saturation is largely dependent on seasonal precipitation patterns and the intensity of drainage improvements, a threshold date for the introduction of grazing onto the wetland is not readily determined.

Another wetland value which could be affected by grazing activities involves the reproduction cycle of the Lomatium bradshawii, a parental herb indigenous to the southern

Willamette Valley. The Lomatium population at Jackson-Frazier is large and thriving and primarily located within the deschampsia prairie, the area with the highest forage values. The plant blooms early in the growing season, in March or April (Kagan, 1981 & 1986). The plant pollinates instantly and sets seeds in May. The plant matures during May and early June, usually shedding seeds by mid to late June. The Lomatium bradshawii seeds are subject to waterborne transport in the winter and spring when the wetland is flooded. The mature plants lapse into dormancy during July. By August no evidence of the plants are apparent within the wetland.

Grazing in the Jackson-Frazier Wetland occurred over an extensive period of time from early 1900's to the late 1950's when the wetland was a part of the Fisher Farm. Despite intensive grazing over this extended period, rare plants, including the Lomatium bradshawii, are found in abundance on the Jackson Frazier Wetland's deschampsia prairie on the southern portion of the wetland (Chambers, 1982; Kagan, 1986). An investigation of eight sites in the southern Willamette Valley containing the Lomatium bradshawii by Kagan in 1981 revealed that three of the sites were subject to grazing during or prior to the investigation. The three sites, Willow Creek Subarea 3, Long Tom, and West 11th Street had plant counts within one square meter quadrants equal to or exceeding the median for all 11 observation areas (See Table 3).

It is recognized that grazing has been responsible for the reduction of invading trees and shrubs into the wetland deschampsia prairie, the habitat of the Lomatium bradshawii. Fires have also played an important role in the control of successional growth; however, with a dramatic negative impact on survivorship of the Lomatium bradshawii at the Finley Wildlife Refuge (Kagan, 1981). A relationship between the plant survival age, and fuel load and heat generated is suggested by Kagan.

The palatability of Lomatium bradshawii to livestock is assumed to be high according to Kagan; however, there is no direct evidence to suggest this. The Lomatium species is known to have a range of palatability from poor to good for cattle, but usually poor for horses. Deer and elk are known to relish several species and probably all species are palatable to game animals (USFS Range Handbook, 1937).

Grazing would serve to reduce successional plant growth which threatens the deschampsia prairie wetland community and the Lomatium bradshawii habitat. The density studies performed by Kagan (Table 3) indicate that healthy populations are maintained in areas subject to grazing. The Nature Conservancy stated that "Grazing with proper seasonal and spatial restrictions could be compatible..." (Margolis, 1982). Dr. and Mrs. Frenkel also testified that grazing may be compatible with the wetland if limited to July through September.

Boarding horses on the wetland would not be practical on a year-round basis. Horses could be possibly pastured on the wetland, but the development of a full boarding facility would require either or both drainage or filling of the wetland. Draining the wetland has been discussed earlier. Filling the wetland to an extent to provide for a boarding structure, an arena, parking, and support facilities would be an expensive undertaking for a marginally profitable enterprise. The Corps and Division of State Lands have also previously noted the unlikelihood of granting a permit for filling the wetlands.

Christmas trees production - The Soil Conservation Service (SCS) reports that the soils found on the wetland site are not well suited to the cultivation of Christmas trees. The revised soil map depicts a greater concentration of Bashaw soils which have a seasonal high water table above the surface. Conifers generally do not grow well where the water table is near or at the surface. The Waldo soils found at the extreme north central portion of the

wetland could possibly support Scotch Pine cultivation, a species which is more tolerant of high water table. Waldo soils are not generally very productive for Christmas tree production according to SCS soil scientists. Christmas tree cultivation is economically unsuitable on the site due to the soil and water table conditions.

Aquaculture - Because the wetland is dried out from July to November, aquaculture uses cannot be introduced unless drainage outlets are blocked with dams so as to maintain surface water within the wetland throughout the year. Because of the series of drainage outlets and the shallow profile of the outlets and adjacent property, an extremely long dam would have to be constructed to provide for year-round flooded conditions within the wetland. Such a change in the hydrology would clearly have a detrimental impact on the hydrology of the wetland and the type of vegetation within the wetland.

An number of the considered agricultural practices, if managed properly in full consideration of wetland values, could prove to be beneficial to the wetland. Goal 5 administrative rules states that a use is a conflicting use "if allowed, could negative impact a Goal 5 resource site." On balance farm uses "could" impact the resource site. A number of the activities such as land clearing, plowing and tilling, and drainage would definitely impact the resource site.

ESEE Analysis

Economic Consequences: Income to property owners derived from the agricultural use of the property containing the resource. Possible flood damage to farm fields along Frazier ditch and residences and urban facilities along Village Green ditch as may result from drainage improvements and land clearing.

Testimony submitted in response to a previous ESEE Analysis suggested the use of Marshall's analysis in determining the economic consequences of the conflicting use on the site. Marshall utilized a value assessment methodology which compared the value of other publicly-owned open space (U.S. Fish and Wildlife and Department of Fish and Wildlife Refuges) as a means of determining the value of the Jackson-Frazier Wetland as public preserve. Marshall determined that the wetland was worth $2,022 per acre as a public preserve. It was suggested this value be measured against the potential net income which could be derived from the property if drained and put into agricultural use. Accurately estimating the capitalization of improvements, production costs and other expenses would be a difficult task. Testimony submitted at the September 1986 hearing by Paul Rigor, President of the Benton County Farm Bureau indicated that the property would be worth from $750 to $1000 per acre as agricultural land if it could be drained. From Marshall's analysis and this testimony one could conclude that the property would lose value if it were used as farm land as opposed to its retention for wetland values.

Social Consequences: Loss of a wetland of regional and state significance and its contribution to scientific knowledge and nature study. Possible loss of plant species designated as endangered. Loss of open space visual qualities. Loss of animal habitat and limited small game hunting and trapping opportunities. Loss of bird refuge values. Associated burning of debris would create obnoxious dense smoke which would affect neighboring urban dwellers.

Environmental Consequences: Loss of wetland characteristics caused by conversion for agricultural use, including the potential loss of rare plants, vernal pond, and deschampsia prairie. General change in wetland hydrology. Loss of wildlife habitat, possible destruction of rare and endangered plants, soil erosion, sedimentation, decrease in water quality. Possible beneficial removal of undesirable woody vegetation encroaching on

deschampsia prairie. Soil compaction. Associated burning would contribute to valley air pollution.

Energy Consequences: The conversion of the area for productive agricultural uses would require the use of heavy equipment which consumes large quantities of petroleum fuels. The public would have to travel a greater distance to observe a wetland area using additional energy.

Establishment of dwellings, agricultural buildings, commercial buildings in conjunction with agricultural uses, schools, churches, or personal use airports

The owner(s) of property located within a wetland could seek to establish a dwelling associated or not associated with a farming activity occurring within the wetland. Similarly, a commercial building for the operation of a commercial activity in conjunction with farm use, or a school or church could be established, subject to review under the Exclusive Farm Use Zone.

Establishment of a dwelling or a commercial or other public building within the wetland would be unlikely due to poor suitability for individual septic systems. Municipal services are not an option due to the City of Corvallis utility extension policies which prohibit the extension of services outside of the City. The wetland is also within a flood hazard area which would require elevating a proposed structure on piles or fill. Access to the structure would also require fill.

Agricultural buildings are permitted within the EFU zone and could be proposed for placement within the wetland. Since the wetland is a flood hazard area, all buildings proposed for placement within the wetland would be subject to County flood plain regulations requiring the structure to be placed on fill or piles. Native vegetation on a building site would be impacted by construction of such a building.

The construction of a private airstrip would require a considerable amount of fill which would be detrimental to the wetland's hydrology and vegetation. Placing the amount of fill required for an airstrip would have a significant impact on wetland values.

ESEE Analysis

Economic Consequences: The cost of constructing a dwelling, farm building, or other commercial or public building or a private airstrip within the wetland would be abnormally high due to flood hazard requirements and the cost for preparation of the site for development relative to other upland sites on the affected properties.

Social Consequences: Construction of an agricultural building, commercial or public building, personal use airport, or the establishment of a dwelling within the wetland could produce a negative visual impact within the wetland.

Environmental Consequences: An agricultural, commercial or public building, personal use airport, or dwelling would effectively destroy all vegetation within a determined area. Fill and or foundation excavation would be required in order to comply with flood hazard regulations.

Energy Consequences: Energy costs of constructing an agricultural, commercial or other building, personal use airport, or dwelling within the wetland would be higher than in other locations due to special flood hazard building standards and site development requirements.

Propagation and harvesting of forestry products

The existing trees within the wetland, including alder, ash, cottonwood and willow, could be harvested as forestry products. The timber on the wetland has value only for use as firewood. Access to the timber would be restricted due to wet soil conditions.

Removal of the forest vegetation from the wetland would cause a loss of some wildlife habitat values. These wildlife values are not unique, since similar riparian vegetative areas exist throughout the Willamette Valley along other tributary streams. The isolated nature of the wetland further diminishes its habitat values. Nonetheless, waterfowl, game birds and birds of prey have been observed on the site. The area also contains beaver and other fur-bearing mammals, including deer. Clearcutting of the site would undoubtedly dislocate many of these animals to other locations, most likely upstream along Jackson or Frazier Creeks in Crescent Valley. Tree removal could be advantageous; however, promoting ground cover growth which could improve forage for grazers and improve conditions for the re-establishment of native wetland prairie vegetation.

The introduction of managed silvaculture in the wetland is not feasible since the soils found in the wetland are not productive for these purposes. The clay substrata restricts root penetration and therefore stunts tree growth. Neither the Bashaw nor Waldo soils found in the wetland are assigned woodland suitability ratings in the Benton County Soil Survey.

A clearcut harvest of the trees on the site would have a short-term negative impact on the wetland's wildlife habitat values. These values are not considered to be significant or unique, however. This impact would be partially offset by the benefits of providing the opportunity for the expansion of the range of the wetland prairie.

The Forest Practices Act (OAR 629-24-448) has jurisdiction over the commercial harvest of forestry resources within a wetland. The Department of Forestry, in consultation with the Department of Fish and Wildlife, makes a determination and is able to restrict the harvest of trees within the wetland. The Department of Forestry has the jurisdiction and authority to control whether a harvest would be permitted, and if permitted, the method and timing of the harvest so as to minimize the negative impacts on the environment. The potential conflicts associated with this practice would be controlled by the combination of FPA rules and site conditions.

The harvesting of forest products is a conflicting use, however The Department of Forestry has exclusive jurisdiction over forest harvest on the resource site.

Hunting and Fishing Preserves and Other Recreation Facilities

According to historical accounts the Jackson-Frazier wetland has been used for hunting. A duck blind was observed during an earlier reconnaissance of the site. The potential as sport game hunting preserve is limited however, due to the fact that the 130 acre forested area is isolated from other game habitat by Highway 99W, farm fields and urban development. The Oregon Department of Fish and Wildlife has recognized the potential of the site as a waterfowl hunting preserve. Further flooding of the wetland by constricting existing drainage outlets and removal of trees could possibly further improve the waterfowl habitat and the value of the wetland for this use.

The proximity of adjacent urban development to the south of the wetland presents a conflict for this use of the property. Noise and safety concerns relative to hunting in the wetland could serve to restrict or prohibit this use The use is generally compatible with wetland values, however.

Passive recreational use of the wetland could possibly be compatible use. A public or private park with a resource focus could be developed within the wetland with a series of elevated walkways. Visitor facilities would have to be developed outside of the wetland, possibly on City owned property on Lancaster Avenue. A recreation facility proposal was previously proposed in the 1984 Wetland ESEE Analysis.

Playgrounds and campgrounds are clearly not an appropriate use of the wetland. Since both of these active recreational facilities typically require sewage disposal facilities which cannot be provided on site, it is not feasible that these uses would be developed within the wetland. Small scale neighborhood playground facilities without sewage disposal facilities are often provided by local government on publicly owned land. It is not the County's intention to acquire the wetland property for development of a playground or any other use. There already exists a playground facility approximately 1/4 mile away at the Village Green Park on Conifer Boulevard. This facility adequately meets all the needs for playgrounds in this area.

Golf courses typically contain water hazards as a way of providing for more exciting and challenging play. A golf course contained within a water hazard is clearly not feasible on the site and conflicts with the resource site.

While development of a park facility for wetland wildlife viewing or the operation of a hunting and fishing preserve could be compatible use within the resource, the unrestricted development of a recreational facility could conflict with the wetland resource. Hunting and Fishing Preserves and other recreational and park facilities are therefore considered to be a conflicting use.

ESEE Analysis

Economic Consequences: Permitting recreational facility development, such as a wildlife/wetland viewing area or a hunting preserve, would provide a tangible beneficial use for the public or private owners to offset ongoing maintenance costs. The cost of construction facilities in a manner which does not impact the resource may be higher than other alternatives.

Social Consequences: The development of recreational facilities would expand the utility of the wetland as a recreational resource and a education opportunity for the community. The utilization of the resource as a hunting preserve could likely conflict with nearby residential uses and other recreational use of the resource.

Environmental Consequences: The environmental consequences for the utilization of the resource as a recreational site would vary depending on the level of associated development.

Energy Consequences: The energy consequences of the utilization of the resource as a recreational facility would include a transportation energy savings for wetland wildlife viewing or hunting as compared to other similar sites at more distant locations in the County.

Mining, Exploration Operations

Exploration, mining, aggregate extraction and exploitation of geologic resources under the Jackson-Frazier Wetland would involve significant disturbances to the wetland's hydrology, vegetation and current site conditions. The Department of Geology and Mineral Industries (DOGAMI) has determined that aggregate exists under the wetland.

A permit would be required from the Division of State Lands (DSL) for the removal of soil from the wetland in addition to the DOGAMI permit. DSL would not issue permit approval for an activity which would produce such a drastic impact on the wetland. Because this use would not be allowed by the DSL, the County determines mining to not be a conflicting use. If allowed, however, the County recognizes that this activity would be a conflicting use and also presents an alternative approach which includes DSL's regulatory authority over this use as an element of the County Conservation Program.

ESEE Analysis

Economic Consequences: The property owner would derive an income from the resource use of the property. The cost of extracting aggregate would be higher than other aggregate sources due to the cost of rerouting drainage and disposal of soil and surface material. The value of the property for wetland preservation as described earlier would be lost. The Benton County Tax Assessor values gravel pits between $650 to $870 per acre. This is significantly lower than the value assigned by Marshall. The values are not directly comparable, however.

Environmental Consequences: Mining on the wetland site would devastate wetland values. If mining were to occur, the wetland would very likely cease to exist.

Social Consequences: The community would lose a valuable piece of the natural history of the Willamette Valley if mining was permitted to occur. In addition the impact of a gravel pit adjacent to a residential area would be dramatic and likely generate considerable opposition.

Energy Consequences: The energy costs of extracting aggregate at the wetland site would be higher than the continued and expanded extraction at existing gravel pits.

Public and Commercial utility facilities including sewer, water and power transmission lines and powe generating stations

The location of utility facilities within the wetland could cause a variable degree of impact on the wetland, depending on the intensity of the facility. Sewer, water and power lines could be located within the wetland without incurring a continuing impact to wetland values. The impact resulting from the construction of the utility lines would diminish as a result of natural regeneration. A more intensive utility facility such as a power substation would cause more serious and irreparable conflicts with the wetland values. Utility facilities could cause an impact on the Goal 5 resource.

ESEE Analysis

Economic Consequences: The cost of installing utility facilities within the wetland may be lower than routing utility lines around the wetland.

Social Consequences: Installing above ground utility facilities within the wetland would be a diminish the resources visual qualities.

Environmental Consequences: The long term environmental consequences of installing underground utility lines is unknown, but it is believed to be minimal. The method of installation may affect of such a facility's impact on area hydrology. Short term disturbance of vegetation would also result. Failure to remove excess overburden would cause a loss of wetland area. Above ground utility facilities could result in the loss of the timing of installation would also determine the impact of construction activity on the resource.

Conclusion

The County finds that all uses which are allowed either outright or subject to review as a conditional use "could negatively impact" the wetland. The degree of negative effect on the wetland resulting from various uses and associated activities and practices is variable and strongly dependent upon the management objectives towards which the use or activity is directed. The County identifies all uses and activities permitted under the Exclusive Farm Use zone as conflicting uses.

The determination of the ESEE Consequences of the identified conflicting uses provide a basis to demonstrate that the conflicting uses, "if allowed, could negatively impact the Goal 5 resource site." The County has applied a strict standard in determining whether a use is a conflicting use. LCDC's acknowledgement of a previous ESEE Analysis and Protection Program submitted by the County was remanded by the Court of Appeals based upon a determination that the County did not correctly consider uses which the County argued as being prohibited by state and federal wetland permit programs as conflicting uses. In an attempt to remedy the inadequacies of the County's previous ESEE review and follow the instructions of the Court, the County identifies all uses as conflicting uses.

The County finds that a number of uses and activities which are permitted outright or conditionally by the Exclusive Farm Use Zone could have a beneficial result on the protection of the wetland. Potential negative impacts associated with the establishment of these beneficial uses or activities could be offset by specially limiting the activities to the extent that they do not produce an adverse impact.

IV. BENTON COUNTY

Jackson-Frazier Wetland Conservation Program

The proposed Benton County Jackson-Frazier Wetland Conservation Program is based on the determination of the economic, social, environmental and energy consequences of the identified conflicting uses. Benton County's acquisition of 76% of the inventoried wetland resource enhances the County's ability to provide an adequate level of protection of the resource in compliance with the requirements of Statewide Planning Goal 5. County ownership provides the opportunity to control land use activities on the publicly owned acreage to a greater degree possible than a strictly regulatory program would allow.

The Goal 5 administrative rules require the County to "develop a program to achieve the Goal" (OAR 660-16-010). The County is expected to "resolve" conflicts by considering "the nature of conflicting uses and ESEE consequences" in accordance with one of three approaches specified by the rule. The rule states that "compliance with Goal 5 shall be based upon the plan's overall ability to protect and conserve each Goal 5 resource."

The rule provides three approaches for the protection of the wetland resource; (1) protect the resource site, (2) allow conflicting uses fully, and (3) limit conflicting uses. In 1982, the County submitted a Goal 5 program which fully allowed conflicting uses. The program was rejected by the Land Conservation and Development Commission.

The November 1990 proposed ESEE Analysis identified a number of uses that were not conflicting uses; but nevertheless, recognized that these uses should be limited to some degree in order to assure protection of the resource. In response to comments received on the earlier draft, the determination of conflicting uses has been revised to include all uses permitted under the Exclusive Farm Use Zone, including uses which were proposed to be regulated by the previously proposed protection program.

The initial draft of the Wetland Overlay Zone contained in the November 1990 proposed ESEE Analysis could arguably be considered as a "Limit Conflicting Use" protection program. Goal 5 Administrative Rule (OAR 660-16-010 (3)) requires that if the County continues with this approach, that "the Comprehensive Plan, and Plan and Zone designations identify uses and activities which are allow, prohibited or allowed conditionally." The rule requires that the protection program contain "specific standards or limitations" on permitted and conditional uses, and "clear and objective conditions or standards" for uses which are conditionally allowed.

Comments received following the release of the November 1990 ESEE Analysis concerning the proposed Wetland Overlay Zone suggested that proposed Review Criteria (BCC 87.035), which were incorporated from the statutory review criteria for Wetland Conservation Plans and Fill and Removal Permits, were not "Clear and Objective". Neither the Statewide Planning Goals nor the administrative rules provides guidance concerning what constitutes "clear and objective" criteria or standards. Case law is also similarly ambiguous on this matter.

Policy based criteria, such as provided for in state statute, are arguably not clear and objective. Engineering specifications are generally agreed to constitute clear and objective standards. It is beyond the scope of this review to develop engineering standards that minimizes negative impacts for uses and activities which may or may not occur within the Jackson-Frazier Wetland.

Policy bases criteria, such as provided for in the state statute, are arguably not clear and objective. Engineering specifications are generally agreed to constitute clear and objective standards. It is beyond the scope of this review to develop engineering standards which minimize negative impacts for uses and activities which may or may not occur within the Jackson-Frazier Wetland.

The January 1991 ESEE Analysis suggested that due to the inability to prepare an adequate and defensible program for allowing some uses to a limited degree, the site should be provided full protection in accordance with OAR 660-16-010(1). The January 1991 ESEE suggested that possible beneficial uses could be permitted at a later date by processing an amendment to the proposed protection program.

In response to the "3A" program contained in the proposed January 1991 ESEE, Robert and Elizabeth Frenkel and the Nature Conservancy raises objections to such an approach. They were concerned that prohibition against interim management measures would discourage the involvement of natural resource management entities and ultimately result in the loss of many wetland values. In the alternative, the Frenkels recommended that the County adopt a "3C" program which would limit conflicting uses to those activities related to resource management and public recreation, subject to review criteria. The recommended review criteria would require that the permitted uses "utilize the best available management practices and not result in any adverse impact to the inventories resource." The Frenkels have suggested that the proposed permitted uses and criteria meet the standards required by Goal 5 rule. With minor changes, the protection program recommended by the Frenkels was adopted by the County.

The adopted County protection program rezones portions of the wetland under the County's ownership to Open Space. Since this zone can only be applied upon application of the property owner (BCC 61.005), the privately-held 35 acres of inventoried wetland cannot be rezoned to Open Space without the authorization of the two property owners. The County has requested the property owners to authorize such an application, or in the alternative to provide for donation of the wetland portions of their property to the Count, which could in turn provide for the rezoning of the property for Open Space. As of the date of the preparation of this staff report, the affected property owners have not responded to the County's request.

In the absence of the legal ability under the current zoning provision to designate the property under an Open Space Zone, or the ability to acquire the remaining wetland acreage through donation or purchase, the County meets the requirement of Statewide Planning Goal 5 through the adoption and application of a Wetland Overlay Zone to the 147 acres delineated as wetland.

The adopted protection program provides for dual protection under Open Space Zoning and the Wetland Overlay Zone, would effectively limit conflicting uses in accordance with Statewide Planning Goal 5 [OAR 660-16-010(3)]. Map 6 indicates the proposed locations of the Open Space and Wetland Overlay Zoning.

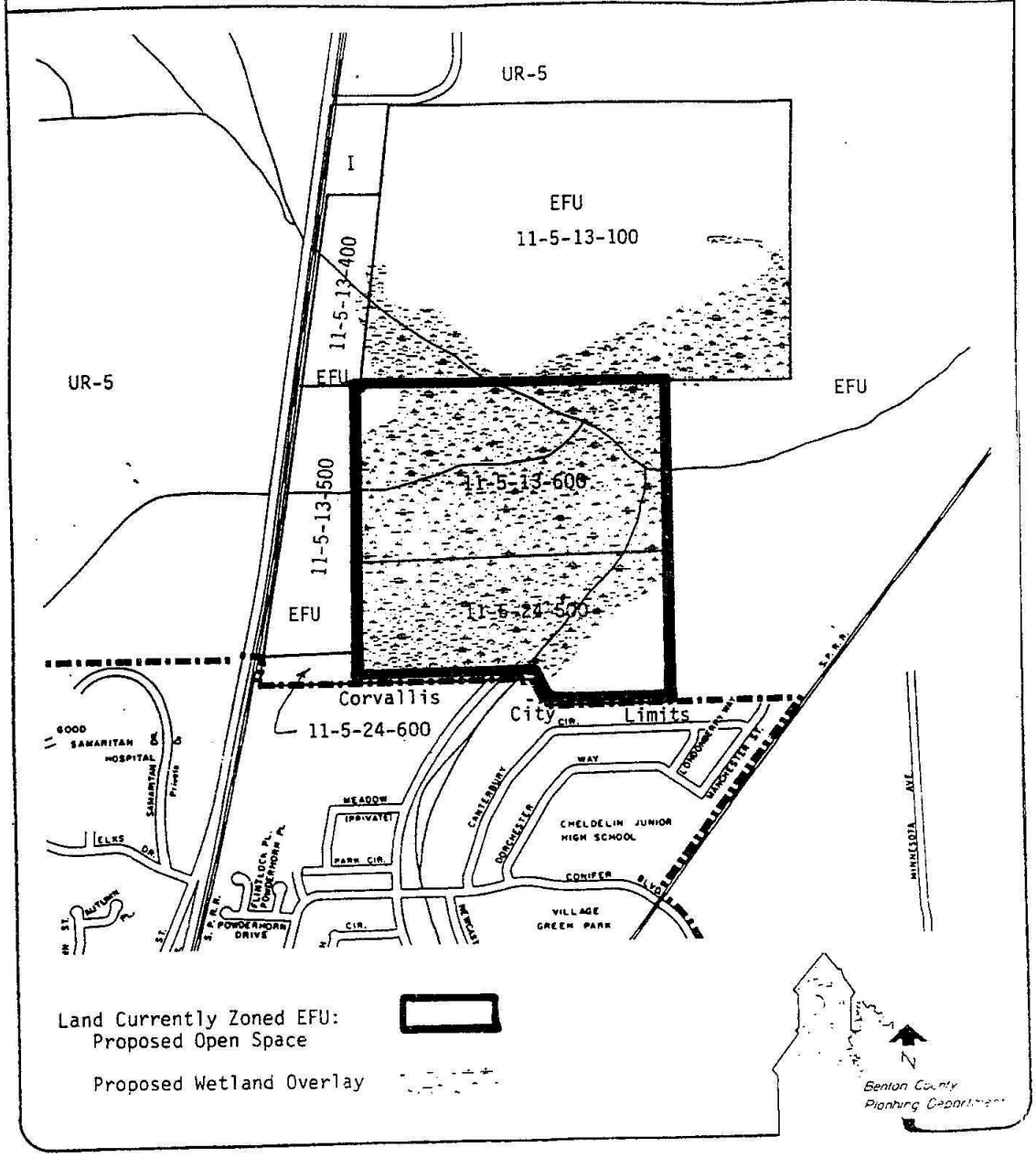
The elements of this section of the report describe the basis and justification for the County's decision to utilize a combination of Open Space Zoning and a Wetland Overlay Zone as the County's Protection Program for the Jackson- Frazier Wetland.

Open Space Zoning

The County Open Space Zone is proposed to be applied to the entire 130.62 acres in County ownership. Approximately 19 acres are upland areas, located outside the area

APPLICANT: Benton County MAP #7 FILE NUMBER: L 90-10

SCALE: 1" = 1,000' **SITE MAP** HEARING DATE:



Land Currently Zoned EFU: Proposed Open Space

Proposed Wetland Overlay

Benton County Planning Department

00033

delineated as wetland. These areas are located in the southeast and northwest quadrants of the county property.

Section 61.010 (1) of the County Development Code establishes that Open Space Zone may be applied to "wetlands, as recorded by the U.S. Fish and Wildlife Service National (sic) Wetland Inventory Maps". The County has elected to include the referenced 19 acres of upland area within the Open Space Zone in order to provide for the protection of the adjoining wetland resource and to provide for an approach which would provide for preparation of a detailed Site Management Plan which would integrate the appropriate conservation and development of upland and wetland acreage.

Section 61.105 of the County Code requires the preparation of a Site Management Plan which describes the intent and proposed uses and a description of the resource. The preceding background information adequately assesses the character of the site. The County proposes to adopt an interim management plan which would preserve the existing character of the site. The proposed interim management plan would restrict all management measures to the extent permitted under the adopted Wetland Overlay Zone.

The County would provide permission to access the site for the purposes of scientific investigation and study. The County would permit, but not encourage, more casual passive recreational use for the purpose of nature study. A more detailed access policy will be developed as a part of a Site Management Plan to be prepared at a later date.

The proposed interim management plan would remain in effect for a definite period of time between adoption of the Open Space Zone and the preparation of a more detailed Site Management Plan. The County Budget Committee will consider a budget proposal for the preparation of a detailed Site Management Plan as a part of the FY 91-92 budget process. The process for the preparation of the proposed plan and the scope of the plan's elements will be developed during the budget process. Among the possible elements which could be considered in the proposed management plan is a determination of the significant wetland values which should be protected, management measures needed for the protection of the values, recreation opportunities, management costs, and possible entities for the ownership and/or management of the resource. The relationship of the County owned acreage with other adjoining wetland acreage can also be addressed in the process of preparing the proposed plan.

Upon completion of the Site Management Plan, the County would propose to amend the interim management plan, described above, in accordance with the requirements of Section 61.115 of the Development Code. This section requires that the County adopt amendments to the Management Plan in accordance with the legislative/quasi/judicial process that is provided for during initial adoption of the Open Space Zone.

Section 61.110 of the Development Code specifies the following criteria to be used "to evaluate whether the site management plan is consistent with the nature of the resource that it is designed to protect":

(1) The proposed uses will not result in the loss of rare, irretrievable or irreplaceable natural features, or scientific opportunity;

The proposed interim management plan would preserve the existing character of the · etland resource and as a result would not represent a loss of natural features. The County would provide for scientific inquiry on the site which would provide data for the preparation of the management plan.

(2) The proposed use will not disturb substantially unaltered natural features or areas, or areas possessing natural features;

The intentional absence of management improvements will not create disturbances to the wetland's natural features.

(3) The proposed use will result in a public benefit which would be maximized on the subject site when compared to similar properties not possessing unique features;

The public benefit derived under the interim management plan would be maximized on the wetland site by providing additional opportunity for analysis and review prior to making any decision on the management of the resource. Other properties which do not have the unique feature found on the wetland do not have the opportunity to be preserved or enhanced through additional study.

(4) Adequate buffers shall exist within the proposed open space zone to assure compatibility between the proposed uses and surrounding farming and forestry uses, where applicable;

Since no improved uses are proposed as an element of the interim management plan, the need for buffers between open space uses and adjoining farmland is not applicable.

(5) The site management plan shall be applied along with other standards and requirements to determine if the proposed uses meet the intent of this zone.

The purpose of the Open Space Zone is to "preserve and protect natural, scenic, or recreational resources by managing such resources primarily for open space and recreational purposes". The proposed interim management plan would provide for the protection and preservation of a natural resource. No other standards or requirements in addition to those provided for by Wetland Overlay are determined to be necessary.

The County Comprehensive Plan or Comprehensive Plan Map does not contain a corresponding plan designation for the Open Space Zoning. Other lands which are zoned Open Space include the Corvallis Watershed and the William Finley Wildlife Refuge. Both of these areas represent vast tracts of land and are designated a Significant Public Lands on the County Comprehensive Plan Map. Until a determination is made on the responsible managing entity, it would be inappropriate to provide a similar Comprehensive Plan designation. The Nature Conservancy, a private non-profit organization, had previously expressed interest in the wetland. Other Nature Conservancy holdings in the County maintain the surrounding resource land zoning.

<u>Wetland Overlay Zone</u>

The County proposes to adopt a Wetland Overlay Zone in order to provide for protection for the 35 acre portion of the Jackson-Frazier Wetland in private ownership. The proposed Overlay Zone would be applied to the entire 147 acre Jackson-Frazier wetland, including both the County and private owned portions.

The Overlay Zone would regulate management activities and public recreation uses according to specific review criteria. The following adopted Wetland Overlay Zone provides protection in accordance with the "3C" program:

> **87.005 Purpose.** The Wetland Overlay Zone shall provide for wetland protection in accordance with Statewide Planning Goal 5.

87.010 Application. The Wetland Overlay Zone shall apply to the Jackson-Frazier Wetland as inventoried in the February, 1991 ESEE Analysis adopted into the Natural Resources and Hazards Background Report of the Benton County Comprehensive Plan.

87.020 Uses and Activities. The following uses and activities may be permitted within the Wetland Overlay Zone, subject to the criteria contained in BCC 87.025 and other provisions of this Code:

(1) Conservation or preservation of soil, water, vegetation, fish and other wildlife.

(2) Outdoor recreational activities, such as fishing, bird watching, or hiking.

(3) Management activities to maintain or enhance wetland values, including mowing, spraying, prescribed burning, herbicide application, selective vegetation removal, maintenance of drainage ditches and other drainage controls.

(4) Education and scientific research.

87.025 Review Criteria. The development of facilities or the installation of land improvements related to uses and activities identified in BCC 87.020 shall:

(1) Utilize the best available management practices; and

(2) Not result in any adverse impact to the identified natural values of the wetland which are recognized in the ESEE Analysis.

Comprehensive Plan Amendments

The County Comprehensive Plan contains a number of wetland protection policies pertaining to the Jackson-Frazier Wetland. Policy 94 of the Natural Resources and Hazards Element of the Plan addresses the need for the protection of fresh water marshes by encouraging the prevention of fill and grading operations that decrease the marsh's water source. Policy 95, amended in 1984 as a part of earlier wetland deliberations, expresses the position that wetland prairies should be maintained. Policy 129 requires that County to cooperate with the Division of State Lands in the administration of the fill and removal permit program.

The existing policies establish a general wetland policy direction which assigned the County an advisory and coordination role with respect to wetland protection. The County's previous Goal 5 submittal relied in large part on the extension of this role in the protection of the Jackson-Frazier Wetland to achieve compliance with Statewide Planning Goal 5. The Court of Appeals rejected this approach, interpreting Goal 5 as requiring a more active role in the protection of the resource through regulation or other means.

Several new Comprehensive Plan policies have been adopted as an element of the Wetland's protection program. Policy 156 restates the adopted implementing (zoning) measures which are a part of the Jackson-Frazier Wetland protection program. Policy 57 formalizes the County's commitment to the preparation of a Management Plan. The Frenkels suggested and the County agreed to provide for the preparation of a Management Plan by November 1992.

156. The Jackson-Frazier Wetland and significant natural area shall be protected as a designated Goal 5 resource as documented in the Comprehensive Plan Background

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Report. The protection program shall consist of a Wetland Overlay Zone designation for the 147 acre inventoried wetland and an Open Space Zone designation for the 130.6 acre parcel currently owned by Benton County. The Overlay Zone shall provide for activities which are consistent with the protection and enhancement of the natural area values.

157. The County recognizes the lack of intentional wetland management as a continuing threat to the Jackson-Frazier Wetland. The County commits to the preparation of a Specific Management Plan which prescribes wetland management measures as an element of a Goal 5 Protection Program. The proposed Specific Management Plan shall be completed by November 1, 1992. Upon completion of the proposed Specific Management Plan, the County shall conduct hearings and adopt the Plan in the same manner as a Plan Amendment.

Conclusion

The proposed rezoning of County owned property which contains substantial portions of the Jackson-Frazier Wetland from Exclusive Farm Use to Open Space, in combination with the adoption and application of a Wetland Overlay Zone to the entire wetland acreage as delineated in the ESEE Analysis, provides for an adequate level of wetland protection in accordance with Statewide Planning Goal 5. The proposed additional policy to be included in the County Comprehensive Plan provides an additional statement of policy intent with respect to the protection of the Jackson-Frazier Wetland.

COMMUNITY DEVELOPMENT DEPARTMENT

Planning & Building
360 SW Avery Avenue, Corvallis, Oregon 97333-1192
Phone: (541) 766-6819 Fax: (541) 766-6891
Operations: 8:00 a.m. –5:00 p.m., Monday-Friday

Return to the Development Code Table of Contents

Chapter 61

Open Space (OS)

61.005 Purpose. The Open Space Zone shall preserve and protect natural, scenic, or recreational resources by managing such resources primarily for open space and recreational purposes. The Open Space Zone shall only be applied upon application of the property owner. [Ord 26, Ord 90-0069]

61.010 Standards of Application. The Open Space Zone may be applied to the following types of areas:

(1) Wetlands, as recorded on the U.S. Fish and Wildlife Service National Wetland Inventory Maps.

(2) Privately owned wildlife refuge or sanctuary, as defined in ORS 501.045.

(3) Land approved for open space use assessment under the provisions of ORS 308.740 to 308.790.

(4) Land approved for riparian habitat protection under the provisions of ORS 308.025 and Chapter 720.

(5) Open space area identified by the County or City Comprehensive Plan.

(6) Historical, archaeological or geological sites. [Ord 26, Ord 90-0069, Ord 92-0092]

61.105 Site Management Plan. An application for a zone change to Open Space shall include a site management plan. Such plan shall limit the nature and type of uses allowed in the Open Space Zone consistent with the nature of the resource designed to be protected by the plan. The following information shall be represented on the site management plan:

(1) A brief narrative of intent and proposed uses, including an adequate description of unique natural features or areas that may be located on site.

(2) Site topography, drainage areas, creeks or ponds, and areas of major vegetation types.

(3) Existing structures, improvements, roadway access and utilities, if any.

(4) Existing land uses, ownership, property lines and building locations on adjoining property within 350 feet of the subject property.

(5) Proposed uses for the subject site, including all proposed structures, vehicular and pedestrian circulation patterns and a site drainage plan; and

(6) Any other appropriate information requested by the Planning Official. [Ord 26, Ord 90-0069]

61.110 Criteria for Review of Plan. The following criteria shall be used to evaluate whether the site management plan is consistent with the nature of the resource it is designed to protect:

(1) The proposed uses will not result in the loss of rare, irretrievable, or irreplaceable natural features, or scientific opportunity;

(2) The proposed uses will not disturb substantially unaltered natural features or areas, or areas possessing natural features;

(3) The proposed uses will result in a public benefit which would be maximized on the subject site when compared to similar properties not possessing unique features;

(4) Adequate buffers shall exist within the proposed open space zone to assure compatibility between proposed uses and surrounding farming and forestry uses, where applicable; and

(5) The site management plan shall be applied along with other standards and requirements to determine if the proposed uses meet the intent of this zone. [Ord 26, Ord 90-0069]

61.115 Amendment of an Adopted Plan. Proposed changes to an approved site management plan shall be reviewed by the County in the same manner as the original approval. [Ord 26, Ord 90-0069]

61.205 Permitted Uses. The following uses are allowed in an Open Space Zone, subject to the limitations or requirements of a site management plan approved pursuant to this chapter:

(1) A public or private park, recreation area, or open space use, including a hunting and fishing preserve.

(2) A public campground or picnic sites and public playlot, playground or playfield.

(3) A public boat launching and fishing facility.

(4) A public bicycle and/or pedestrian path or trail system outside a County or public right-of-way.

(5) An equestrian path or trail system.

(6) A golf course, with a minimum of fifty (50) acres, excluding support buildings.

(7) Farm use.

(8) Forest use. [Ord 26, Ord 90-0069]

61.305 Conditional Uses Approved by the Planning Official. The following uses may be allowed in the Open Space Zone by conditional use permit approved by the Planning Official, subject to the site management plan submitted pursuant to this chapter:

(1) One dwelling for a caretaker or watchman, in conjunction with a permitted use.

(2) Temporary structures as may be required during construction of an authorized permanent structure. Such temporary structure shall be removed upon final inspection of the permanent structure by the Building Inspector.

(3) Driving range not in conjunction with a golf course.

(4) Support buildings in conjunction with a golf course. [Ord 26, Ord 90-0069]

61.405 Minimum Parcel or Lot Size. The minimum parcel or lot size shall be consistent with the site management plan. [Ord 26, Ord 90-0069]

61.505 Siting Standards. All structures allowed in the Open Space Zone shall be sited in compliance with BCC Chapter 99 and the following additional standards:

(1) The maximum building height for any dwelling shall be thirty-five (35) feet. Structures such as chimneys, spires, domes, elevator shaft housings, towers, aerials, flagpoles, agricultural buildings, and other similar objects not used for human occupancy are not subject to the building height limitations of this code.

(2) A dwelling located within 200 feet of a forested area shall be provided with a spark arrestor on each chimney and a fire-retardant roof.

3. A structure which is not a water dependent use shall be placed at least fifty (50) feet from the ordinary high water line of any river or major stream. In the case of a creek or minor stream, a structure which is not a water dependent use shall be placed at least twenty-five (25) feet from the ordinary high water line. [Ord 26, Ord 90-0069, Ord 92-0092]

BEFORE THE BOARD OF COUNTY COMMISSIONERS
FOR THE STATE OF OREGON FOR THE COUNTY OF BENTON

An Ordinance Amending the Benton County Comprehensive Plan to Adopt the Jackson-Frazier Wetland Management Plan	)))	ORDINANCE No. 92-0095

WHEREAS, Benton County committed to the preparation of a Specific Management Plan as an element of a Goal 5 Protection Program for the Jackson-Frazier Wetland; and

WHEREAS, the Board of Commissioners appointed a task force to prepare such a Specific Management Plan; and

WHEREAS, the task force prepared a Specific Management Plan, entitled the Jackson-Frazier Wetland Management Plan, which prescribes wetland management measures for the Jackson-Frazier Wetland; and

WHEREAS, the Planning Commission and Board of Commissioners conducted public hearings regarding the Plan.

THE BOARD OF COUNTY COMMISSIONERS OF BENTON COUNTY ORDAINS AS FOLLOWS:

I. SHORT TITLE:

An Amendment to the Benton County Comprehensive Plan to Adopt the Jackson-Frazier Wetland Management Plan.

II. Summary of Amendments:

Section 1. The Jackson-Frazier Wetland Management Plan is incorporated into the Background Report for the Natural Resources and Hazards Element of the Benton County Comprehensive Plan.

Section 2. Amend Policy 159 of the Natural Resources and Hazards Element of the Benton County Comprehensive Plan as follows. (New language is highlighted in **bold** and deleted language is highlighted as ~~strikethrough~~.)

> The County recognizes the lack of intentional wetland management as a continuing threat to the Jackson-Frazier Wetland. The County commits to the **implementation** ~~preparation~~ of a Specific Management Plan which prescribes wetland management measures as an element of a Goal 5 Protection Program. **The Specific Management Plan, entitled the Jackson-Frazier Wetland Management Plan, is incorporated into the Background Report for the Natural Resources and**

Hazards Element of this Plan. The County shall review and update the Management Plan as part of periodic review of the Comprehensive Plan. ~~The proposed Specific Management Plan shall be completed by November 1, 1992. Upon completion of the proposed Specific Management Plan, conduct hearings and adopt the Plan in the same manner as a Plan Amendment.~~

First Reading: October 7, 1992
Second Reading: October 21, 1992
Effective Date: November 20, 1992

Approved as to Form:

BENTON COUNTY BOARD OF COMMISSIONERS

Chair

Commissioner

Commissioner

Approved as to Form:

County Counsel

Recording Secretary

RECEIVED
OCT 24 1992
Benton County Development Dept.

BENTON COUNTY, OREGON 2003-332084
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$5.00 $11.00 $10.00 $15.00 $41.00

00004867200303320840010014

I, James V. Morales, County Clerk for Benton County, Oregon, certify that the instrument identified herein was recorded in the Clerk records.

James V. Morales - County Clerk

Until a change is requested, please send tax statements to:
Benton County

333797

After recording, please return to:
Benton County

BARGAIN AND SALE DEED

GREENBELT LAND TRUST, an Oregon Nonprofit Corporation, Grantor, conveys to BENTON COUNTY, Grantee, the following described real property in Benton County in the State of Oregon:

A tract located in the Government Lot 2, Section 24, Township 11 South, Range 5 West, in the County of Benton and State of Oregon, described as follows: Beginning at a point 39.00 chains East of the Southwest corner of William Knotts Donation Land Claim Number 45, Township 11 South, Range 5 West, Willamette Meridian; thence South 24 degrees West 4.50 chains to the North line of the Archimedes Stewart Donation Land Claim Number 46, Township 11 South, Range 5 West; thence East along the North line of said Stewart claim 850 feet more or less to the Southwest corner of the first tract described in deed recorded in Book G, Page 125, Deed Records; thence North 3.88 chains to the Northeast corner of said tract which is also the South line of the aforesaid Knotts Claim; thence West along the South line of said Knotts Claim 650 feet more or less to the point of beginning.

The true and actual consideration for this transfer stated in terms of dollars is $0.00, the consideration consisting of value wholly other than money.

"THIS INSTRUMENT WILL NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY APPROVED USES AND TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES AS DEFINED IN ORS 30.930."

IN WITNESS WHEREOF, the Grantor has duly executed this instrument this 20th day of December, 2002.

OFFICIAL SEAL
GERYL L McGOWAN
NOTARY PUBLIC - OREGON
COMMISSION NO. 363425
MY COMMISSION EXPIRES NOV. 26, 2006

Greenbelt Land Trust, Inc., an Oregon Nonprofit Corporation

By _____
Cary B. Stephens, President

STATE OF OREGON, County of Benton) ss.

This instrument was acknowledged before me on this 20th day of December, 2002, by CARY B. STEPHENS as President of Greenbelt Land Trust, Inc.

_____
Notary Public for Oregon
My Commission Expires: 11-26-2006

Benton County, Grantee, hereby accepts this Bargain & Sale Deed on this 30th day of December, 2002.

Benton County, Oregon

By _____

STATE OF OREGON, County of Benton) ss.

This instrument was acknowledged before me on this 30th day of December, 2002, by ANNABELLE JARAMILLO as COMMISSIONER of Benton County, Oregon.

OFFICIAL SEAL
MAURINE M. STEINAUER
NOTARY PUBLIC - OREGON
COMMISSION NO. 321610

_____
Notary Public for Oregon
My Commission Expires: March 14, 2005

333798

BEN COUNTY, OREGON 2003-332085
DE-EAS 01/06/2003 12:39:29 PM
Cnt=1 Stn=8 COUNTER1 $116.00
$80.00 $11.00 $10.00 $15.00

I, James V. Morales, County Clerk for Benton County, Oregon, certify that the instrument identified herein was recorded in the Clerk records.

James V. Morales - County Clerk

After Recording Return To:
Cary Stephens
[illegible] 7th Street, Corvallis 97330

Key title Co. 10-36761

JACKSON FRAZIER WETLAND CONSERVATION EASEMENT

Deed of Conservation Easement

THIS GRANT DEED OF CONSERVATION EASEMENT is made this 3rd day of September, 2002, by BENTON COUNTY BOARD OF COMMISSIONERS ("Grantors"), in favor of THE GREENBELT LAND TRUST, an Oregon nonprofit corporation ("Greenbelt").

RECITALS:

A. Grantors are the sole owners in fee simple of certain real property of 4.08 acres, more or less, (T11S, R5W, Section 24, lot 600) in Benton County, Oregon, more particularly described in Exhibit A & B attached hereto and incorporated by this reference ("Property"). Greenbelt is a private, nonprofit organization created and organized to preserve, retain and protect the conservation values of real property, and is qualified to acquire and hold conservation easements as a "holder" defined in ORS 271.715(3).

B. The Property possesses wetland habitat, educational and open-space values (collectively, "conservation values" of great importance to Grantors, the people of Benton County and the people of the State of Oregon). The State of Oregon has recognized the importance of private efforts toward preservation of natural systems in the state by the enactment of ORS 271.715-271.795.

C. The specific conservation values of the Property are documented in an inventory of relevant features of the Property, dated July, 2002, (on file at the office of Greenbelt or attached hereto as Exhibit C) and incorporated by this reference ("Baseline Documentation"), which consists of field reports, maps, photographs and other documentation that the parties agree provide, collectively, an accurate representation of the Property at the time of this grant and which is intended to serve as an objective information baseline for monitoring compliance with the terms of this grant.

D. Grantors intend that the conservation values of the Property be preserved and managed to protect and maintain a typical regional wetland type (palustrine emergent wetland), native plant communities (principally tufted hairgrass community), biological diversity, water quality, and essential habitat for populations of native plants and animals. Existing hydrological conditions will be maintained and if possible, enhanced, to perpetuate and enhance the existing wetland. In order to preserve these wetland characteristics the Grantor shall manage the property using the guidelines contained with the Jackson Frazier Management Plan. The Grantor shall also execute a change in zoning on the property to an Open Space zone consistent with the zoning regulations of Benton County. This change in zoning shall be completed within 6 months of the granting of this easement.

E. Grantors further intend, as owners of the Property, to convey to Greenbelt the right to preserve and protect the conservation values of the Property in perpetuity. Specifically, the purpose of this easement is to protect and maintain a typical regional wetland type, protect or enhance populations of sensitive, threatened or endangered resident species, maintain hydrological conditions to perpetuate the existing wetland, and provide for public education, research and non-intensive recreational use such as nature and bird study.

F. Greenbelt is a publicly supported, tax-exempt nonprofit organization qualified under Section 501(c)(3) and 170(h) of the Internal Revenue Code, whose primary purpose is the preservation, protection or enhancement of land in its natural, scenic, historical, agricultural, forested and/or open space condition.

G. Greenbelt agrees by accepting this grant to honor the intentions of the Grantors stated herein and to preserve and protect in perpetuity the natural resource conservation and enhancement values of the Property for the benefit of this generation and generations to come.

H. To achieve the intention of the parties, Grantors intend to give to Greenbelt a perpetual and irrevocable conservation easement in gross over the property, to create certain restrictive covenants and equitable servitude's for the benefit of Greenbelt in gross which will bind and run with the Property, and to extinguish irrevocably and perpetually the right to develop the Property, except as expressly permitted in this grant.

AGREEMENT:

1. **Grant of Easement**. In consideration of the above and the mutual covenants, terms, conditions and restrictions contained herein, and pursuant to the laws of the State of Oregon and in particular ORS 271.715-271.795, Grantors hereby voluntarily grant and convey to Greenbelt a conservation easement in perpetuity over the Property of the nature and character and to the extent hereinafter set forth ("Easement").

2. **Declaration of Restrictions**. The Grantors hereby declare that the Property shall be held, transferred, sold, conveyed, given, leased, occupied and used subject to all of the restrictions, covenants, easements, equitable servitudes and affirmative obligations set forth in this Easement.

3. **Purpose**. It is the purpose of this Easement to assure that the Property will be retained forever in its natural, wetland and open-space conditions to maintain and enhance a typical regional wetland type, associated native plant communities, biological diversity and essential habitat for populations of native plants and animals. Existing hydrologic conditions shall be maintained to perpetuate the existing wetland. This easement is meant to prevent any use of the Property that will significantly impair or interfere with the

conservation values of the Property. Grantors intend that this Easement will confine the use of the Property to such activities as are consistent with the purpose of this Easement. The Grantor and Grantee shall work together to ensure that the property is managed under the guidelines of the Jackson Frazier Management Plan. This plan shall guide all activities on the property.

4. **Rights of Greenbelt**. To accomplish the purpose of the Easement, the following rights are expressly conveyed to Greenbelt by this Easement:

(a) To preserve and protect the natural resource, wetland and open space conservation values of the Property;

(b) To enter upon the Property at reasonable times in order to monitor Grantors' compliance with and otherwise enforce the terms of this Easement; provided that such entry shall be upon prior reasonable notice to Grantors, and Greenbelt shall not unreasonably interfere with Grantors' use and enjoyment of the Property;

(c) To enjoin any activity on or use of the Property inconsistent with the purpose of this Easement and to require the restoration of such areas or features of the Property that may be damaged by any inconsistent activity or use, pursuant to paragraph 8; and

(d) To enter upon the Property to collect data, monitor, study and make scientific observations of its natural elements and ecosystems for scientific and educational purposes.

(e) To participate in the development of management plans for the property and to review any proposed changes to the plan to determine their impacts on the conservation values of the property.

5. **Prohibited Uses**. Any activity on or use of the Property inconsistent with the purpose of this Easement is prohibited. Without limiting the generality of the foregoing, the following activities and uses are expressly prohibited:

A. No residence or associated building capable of being used for permanent human habitation will be constructed on-site at any time.

B. The change, disturbance, major alteration or impairment of the significant relatively natural ecological features and values or the destruction of other significant conservation interests on the Property identified by this Conservation Easement.

C. The removal, cutting or destruction of native vegetation except for the purposes of natural resource habitat enhancement. Vegetation

management activities shall be consistent with the adopted Jackson-Frazier Management Plan.

D. Alterations to the existing hydrologic conditions of the property, except if such alterations enhance the conservation values of the property.

E. The introduction of non-native plant or animal species.

F. The division, subdivision or de facto subdivision of the Property.

G. The establishment of any commercial or industrial uses.

H. The construction or placing of buildings, commercial camping accommodations, mobile homes, sports facilities, trailers, billboards or other advertising material.

I. The filling, dumping, excavating, draining, dredging, mining, drilling, removing, or the exploring for or extracting of, minerals, hydrocarbons, soils, sands, gravel, rock or any other material on or below the surface of the property. Placement of gravel or other materials for trail construction are allowed provided the placement of said materials is in compliance with the Jackson Frazier Wetland Management Plan.

J. The dumping or other disposal of non-compostable refuse, trash, unsightly or toxic materials or agri-chemicals.

K. Construction of any new roads, bridges or vehicle trails. A recreational path and boardwalk may be constructed in such a manner as to allow for public access while minimizing the damage to wetland resources.

L. The changing of the topography of the Property by placing on it any soil, dredging spoils, land fill or other material.

M. Limited public access is allowed as long as it is consistent with the adopted management plan for the Jackson-Frazier wetland.

N. No camping is allowed on site.

No dogs allowed except on leash.

Except for access by management personnel, all motorized equipment, including recreational vehicles are prohibited.

Use of fireworks are prohibited.

6. **Reserved Rights**. Grantors reserve to themselves, and to their personal representatives, heirs, successors and assigns, all rights accruing from their ownership of the Property, including the right to engage in or permit or invite others to engage in all uses of the Property that are not expressly prohibited herein or are not inconsistent with the purpose of this Easement and the adopted Jackson Frazier Wetland Management Plan, provided any applicable government permit is properly obtained.

7. **Request by Grantors of Intentions to Undertake Certain Permitted Actions**. The purpose of requiring Grantors to notify Greenbelt prior to undertaking certain permitted activities is to afford Greenbelt an opportunity to ensure that the activities in question are designed and carried out in a manner consistent with the purpose of this Easement. Grantors shall provide the Greenbelt Land Trust with a current copy of the adopted Jackson Frazier Management Plan. This plan shall guide all actions on the property and any activities undertaken on the property. Actions must be consistent with this plan. The Grantor shall include the Greenbelt Land Trust on the mailing list of the Jackson Frazier management committee and the GLT shall receive notifications of committee meetings and actions. The GLT shall receive a written description of any proposed actions that affect this property. Said description shall contain the nature, scope, design, location, timetable and any other material aspect of the proposed activity in sufficient detail to permit Greenbelt to make an informed judgment as to its consistency with the purpose of the Easement.

   7.1 **Approval Criteria**. Greenbelt's approval shall be based upon compliance with provisions of the Easement, the adopted Jackson Frazier Management Plan, the capability of the proposed action to preserve and enhance the conservation values protected by this Easement, the manner in which the proposed action is carried out, and the likely effect of the proposed action upon the conservation values of the Property. The Grantor and Grantee shall strive to work cooperatively to fulfill the goals and objectives of the Jackson Frazier Management Plan for activities on this site.

   7.2 **Approval Process**. Greenbelt shall review proposed actions and issue a comment letter within (30) calendar days of the receipt of Grantors' written request, provided Grantors' request was submitted in a form acceptable to Greenbelt as provided in paragraph 7. Greenbelt shall state their approval or issue comments that outline their concerns with the proposed actions and suggested remedies. Failure to respond within 30 days of receipt of information shall be deemed approval of Grantor's intentions to undertake certain permitted activities and shall waive any right Greenbelt may have to later object to (or seek enforcement of provisions) subject to the changes contained in the notice. Upon completion of any such action on the Property, Greenbelt shall inspect the Property and, if the action was performed in accordance with the terms of the Easement, issue a letter to that effect, dated at the time of inspection.

8. **Compliance & Enforcement**. Greenbelt's Remedies. If Greenbelt determines that Grantors are in violation of the terms of this Easement or that a violation is imminent, Greenbelt shall give written notice to Grantors of such violation and demand corrective action sufficient to cure the violation and, where the violation involves injury to the Property, resulting from any use or activity inconsistent with the purpose of this Easement, to restore the portion of the Property so injured. If Grantors fail to cure the violation within thirty (30) days of receipt of the notice, fail to begin curing such violation with the thirty (30) day period, or fail to continue diligently to cure such violation until finally cured, Greenbelt may bring action at law or in equity in a court of competent jurisdiction to enforce the terms of this Easement, to enjoin the violation, by temporary or permanent injunction, to recover damages to which it may be entitled for violation of the terms of this Easement or injury to any conservation values protected by this Easement, including damages for the loss of scenic, aesthetic, or environmental values, and to require the restoration of the Property to the condition that existed prior to such injury. Without limiting Grantors' liability therefore, Greenbelt, in its sole discretion, may apply damages recovered to the cost of undertaking any corrective action on the Property. Grantors and Greenbelt expressly agree that the Property, by virtue of its protected features, is unique and that the violation of this Easement and any ensuing harm or alteration of the Property will result in damages which are irremediable and not subject to quantification. Accordingly, Grantors agree that Greenbelt's remedies at law for any violation of the terms of this Easement are inadequate and that Greenbelt shall pursue the injunctive relief described in this paragraph, both prohibitive and mandatory, in addition to such other relief to which Greenbelt may be entitled, including specific performance of the terms of this Easement, without the necessity or proving either actual damages or the inadequacy of otherwise available legal remedies. Greenbelt's remedies described in this paragraph shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or equity.

   8.1. **Costs of Enforcement**. In the event either party brings any action or suit against the other party by reason of any breach of the covenants, agreements or provisions on the part of the other party arising out of this easement, then in that event the prevailing party shall be entitled to have and recover from the other party all costs and expenses of the action or suit, including actual attorney's fees, at trial and on appeal.

   8.2 **Waiver of Certain Defenses**. No delay or omission by Greenbelt in the exercise of any right or remedy upon any breach by Grantors shall impair such right or remedy or be construed as a waiver.

9. **Public Access**. Limited public access is granted provided that said public access is consistent with the goals of the adopted Jackson Frazier Wetland Management Plan.

10. **Costs & Liabilities**. Grantors retain all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep and maintenance of the

Property. Greenbelt shall participate with Grantor in finding sources of funding for stewardship of the property and shall participate in joint stewardship projects, where appropriate.

10.1 **Taxes**. Grantors shall pay before delinquency all taxes, assessments, fees and charges of whatever description levied on or assessed against the Property by competent authority (collectively "taxes"), including any taxes imposed upon, or incurred as a result of, this Easement, and shall furnish Greenbelt with satisfactory evidence of payment upon request.

10.2 **Insurance**. Grantor, upon request shall furnish grantee with evidence of general liability insurance within the limits of tort liability required by the State of Oregon.

11. **Extinguishment**. If circumstances arise in the future such as render the purpose of this Easement impossible to accomplish, this Easement can only be terminated or extinguished, whether in whole or in part, by judicial proceedings in a court of competent jurisdiction, and the amount of the proceeds to which Greenbelt shall be entitled, after the satisfaction of prior claims, from any sale, exchange or involuntary conversion of all or any portion of the Property subsequent to such termination or extinguishment, shall be determined, unless otherwise provided by the laws of the State of Oregon at the time, in accordance with paragraph 11.1. Greenbelt shall use all such proceeds in a manner consistent with the conservation purposes of this grant.

11.1 **Proceeds**. This Easement constitutes a real property interest immediately vested in Greenbelt, which for the purposes of paragraph 11, the parties stipulate to have a fair market value determined by multiplying the fair market value of the Property unencumbered by the Easement (minus any increase in value after the date of this grant attributable to improvements) by the ratio of the value of the Easement at the time of this grant to the value of the Property, without deduction for the value of the Easement, at the time of this grant. The values at the time of this grant shall be those values used to calculate the deduction for federal income tax purposes allowable by the reason of this grant, pursuant to Section 170(h) of the Internal Revenue Code of 1954, as amended. For the purposes of this paragraph, the ratio of the value of the Easement to the value of the Property unencumbered by the Easement shall remain constant.

11.2 **Condemnation**. If the Easement is taken, in whole or in part, by exercise of the power of eminent domain, Greenbelt shall be entitled to compensation as provided in paragraph 11.1 unless otherwise required in accordance with applicable law.

12. **Assignment**. This Easement is transferable by Greenbelt, with prior written approval from the County, and Greenbelt may assign its rights and obligations under this Easement only to an organization that is a qualified organization at the time of transfer under Section 170(h) of the Internal Revenue Code of 1954, as amended (or any successor provisions then applicable). As a condition of such transfer, Greenbelt shall require that the conservation purposes that this grant is intended to advance continue to be carried out.

13. **Subsequent transfers**. Grantors agree to incorporate the term of this Easement in any deed or other legal instrument by which they transfer or divest themselves of any interest in all or a portion of the Property, including, without limitation, a leasehold interest. Grantors further agree to give written notice to Greenbelt of the transfer of any such interest at least thirty (30) days prior to the date of such transfer. The failure of the Grantors to perform any act required by this paragraph shall not impair the validity of this Easement or limit its enforceability in any way.

14. **Estoppel Certificates**. Upon request by the Grantors, Greenbelt shall within thirty (30) days execute and deliver to the Grantors any document, including an estoppel certificate, which certifies Grantors' compliance with any obligation of Grantors contained in this Easement and otherwise evidences the status of this Easement as may be reasonably requested by Grantors.

15. **Notices**. Any notice, demand, request, consent, approval or communication that either party desires or is required to give to the other shall be in writing and either served personally or sent by first class mail, postage prepaid, addresses as follows:

To Grantors:	To Greenbelt:
Benton County Board of Commissioners	Greenbelt Land Trust, Inc
PO Box 3020	P.O. Box 1721
Corvallis, OR 97339	Corvallis, OR 97339

or to such addresses as either party from time to time shall designate by written notice to the other.

16. **Recordation**. Greenbelt shall record this instrument in a timely fashion in the official records of Benton County, Oregon, and may re-record it at any time as may be required to preserve its rights in this Easement.

17. **General Provisions**.

    (a) **Controlling Law**. The interpretation and performance of this Easement shall be governed by the laws of the State of Oregon.

(b) **Liberal Construction**. Any general rule of construction to the contrary notwithstanding, this Easement shall be liberally construed in favor of the grant to effect the purpose of this Easement and the policy and purpose of ORS 271.715-271.795. If any provision in this instrument is found to be ambiguous, an interpretation consistent with the purpose of this Easement that would render the provision valid shall be favored over any interpretation that would render it invalid.

(c) **Severability**. If any provision of this Easement, or the application thereof to any person or circumstance, is found to be invalid, the remainder of the provisions of this Easement, or the application of such provisions to persons or circumstances other than those to which it is found to be invalid, as the case may be, shall not be affected thereby.

(d) **Entire Agreement**. This agreement sets forth the entire agreement of the parties with respect to the Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Easement, all of which are merged herein.

(e) **No Forfeiture**. Nothing contained herein will result in a forfeiture or reversion of the Grantors' title in any respect.

(f) **Joint Obligation**. The obligations imposed by this Easement upon Grantors shall be joint and several.

(g) **Successors**. The covenants, terms, conditions and restrictions of this Easement shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall continue as servitude running in perpetuity with the Property.

(h) **Termination of Rights & Obligations**. A party's rights and obligations under this Easement terminate upon transfer of the party's interest in the Easement or the Property, except the liability for acts or omissions occurring prior to the transfer shall survive transfer.

(i) **Captions**. The captions in this instrument have been inserted solely for convenience of reference and are not part of this instrument and shall have no effect upon construction or interpretation.

TO HAVE AND TO HOLD unto Greenbelt, its successors and assigns, forever.

WITNESS the following signatures.

Date: October 4, 2002.

GRANTOR:
Benton County Board of Commissioners

By [signature]

Its Chairperson

GREENBELT:

By [signature]
Cary Stephens

Its President

STATE OF OREGON)
) ss.
County of Benton)

This instrument was acknowledged before me on the 4th day of October, 2002 by Anna Helen Jaramillo, Chairperson as of Benton County Board of Commissioners.

OFFICIAL SEAL
BELINDA R WALKER
NOTARY PUBLIC - OREGON
COMMISSION NO. 352453
MY COMMISSION EXPIRES FEB. 9, 2006

[signature]
Notary Public for Oregon
My Commission Expires: 2/9/06

STATE OF OREGON)
) ss.
County of Benton)

This instrument was acknowledged before me on the 9th day of October, 2002 by Cary Stephens, President of THE GREENBELT LAND TRUST.

OFFICIAL SEAL
TINA LUNDIN
NOTARY PUBLIC - OREGON
COMMISSION NO. 357345
MY COMMISSION EXPIRES JUL. 7, 2006

[signature]
Notary Public for Oregon
My Commission Expires: 7-7-06

Page 10 - Jackson Frazier Wetland Conservation Easement

Title No. 10-30896 Escrow No. 10-30896

EXHIBIT 'A'

Legal Description:
A tract located in the Government Lot 2, Section 24, Township 11 South, Range 5 West, in the County of Benton and State of Oregon, described as follows: Beginning at a point 39.00 chains East of the Southwest corner of William Knotts Donation Land Claim Number 45, Township 11 South, Range 5 West, Willamette Meridian; thence South 24 degrees West 4.50 chains to the North line of the Archimedes Stewart Donation Land Claim Number 46, Township 11 South, Range 5 West; thence East along the North line of said Stewart claim 850 feet more or less to the Southwest corner of the first tract described in deed recorded in Book G, Page 125, Deed Records; thence North 3.88 chains to the Northeast corner of said tract which is also the South line of the aforesaid Knotts Claim; thence West along the South line of said Knotts Claim 650 feet more or less to the point of beginning.

Subject to:
None

STATE OF OREGON } ss.
County of Benton } 273821
I hereby certify that the within instrument was received for record

'99DEC30 PM 3:19

AND ASSIGNED M278460 1999
In the microfilm records of said county

Witness My Hand and Seal of County Affixed
JOHN K. ANDERSON
County Administrative Officer
By [illegible]

Page 2 of 2

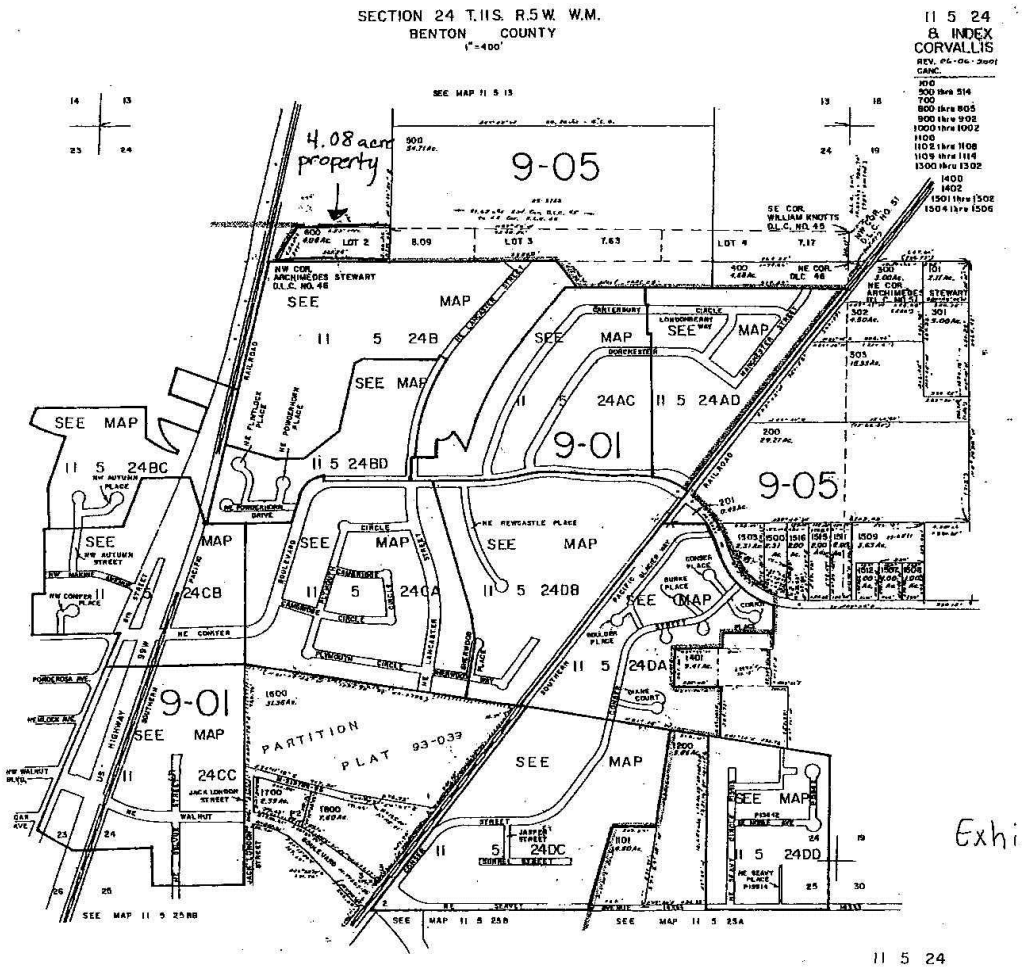

SECTION 24 T.11S. R.5W. W.M.
BENTON COUNTY
1"=400'
11 5 24
& INDEX
CORVALLIS
4.08 acre property
9-05
9-01
PARTITION PLAT 93-039
SEE MAP 11 5 13
SEE MAP 11 5 25BB
SEE MAP 11 5 25B
SEE MAP 11 5 25A
11 5 24

Exhibit B

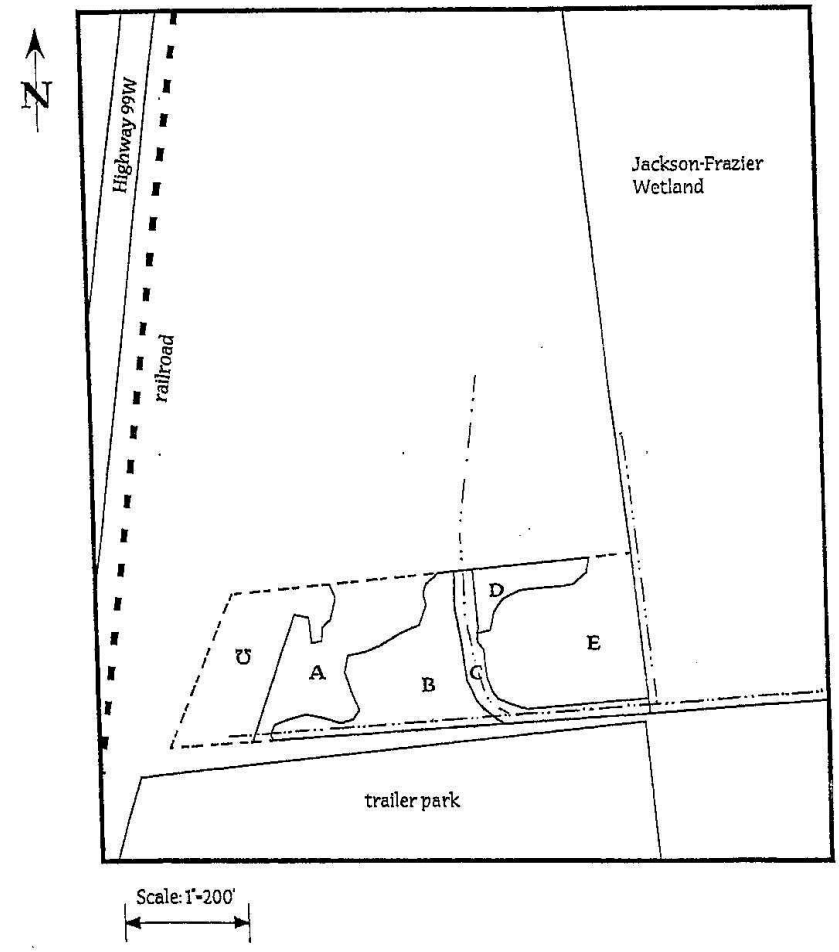


Figure 5.

Wetland Map

---Study area boundary

Jackson-Frazier Wetland Addition
Tax Lot 600 Tax Map 11 05 24 (4.08 acres)
Wetland Area Estimate, 3.32 acres
29 January 2000

Exhibit C

Site Description and Baseline Documentation
For 4 acre addition to Jackson Frazier Wetland
Prepared July 2002
By Greenbelt Land Trust

Background: This property was donated to the Greenbelt Land Trust in December 1999. GLT accepted the donation because the 4 acre parcel was a logical addition to the Jackson Frazier Wetland, owned by Benton County and the property had a mix of wetland types. Acquisition of the property also was consistent with the GLT's 1998 Open Space Plan that identified the Jackson Frazier Wetland and surrounding lands as a priority acquisition area in North Corvallis. The GLT Board of Directors made the decision to deed this property over to Benton County to add to the Jackson Frazier Wetland provided the GLT retained a conservation easement on the land. The County and GLT agreed that the property would be managed consistent with the goals and objectives of the Jackson Frazier Wetland Management Plan.

Property Description: This 4.08 acre property is located at T11S, R5W, Section 24, lot 600 in Benton County, Oregon. The property is located just east of Highway 99 in North Corvallis. The property is bordered by a mobile home park to the south, the Jackson Frazier Wetland to the east, City of Corvallis owned property to the north and Good Samaritan Hospital property to the west. The attached map, Exhibit B, shows the property location. Exhibit A gives the legal description of the property.

A large diameter sewer pipe is present just east of the southeastern property boundary. It is our understanding that this is the stub out for a future sewer extension to North Corvallis. City of Corvallis wastewater improvement plans show that this line will be extended to the north and west at some point in the future.

Wetland Determination- The majority of this site is classified as wetlands. A wetland determination was done for the site in March 2000 by Loverna Wilson and Scott Craig. A copy of the determination is on file with the Greenbelt Land Trust. The approximate wetland/upland boundary shown on the attached map indicates that there are 3.32 acres of wetland on the site and .76 acres of upland next to the abandoned road bed.

Historical Use-. According to Thomas Owens, owner of adjacent property, the site was farmed from the 1960's until the mid 1970's. It was his recollection that it became to wet to farm and farming of the site was abandoned. The wetland determination done in 2000 found three drainage ditches on the site which are probably associated with the former farming activities. One flows east along the southern boundary of the property. A second ditch flows along the east boundary. The third ditch flows south across the middle of the site. The two south flowing ditches empty into this third ditch, which eventually flows into Stewart Slough near Lancaster Street. The slough eventually empties into the Willamette River approximately ¾ mile to the east.

BEFORE THE BOARD OF COMMISSIONERS OF BENTON COUNTY
STATE OF OREGON

In the Matter of Amending the Benton County Comprehensive Plan Map and Zoning Map and adoption of the revised Jackson-Frazier Wetland Management Plan as a background document to the Comprehensive Plan.	))))	**ORDINANCE** **No. 2005-0208**

WHEREAS, on February 8, 2005, the Benton County Board of Commissioners directed staff to initiate Zone Change and Comprehensive Plan Amendment proceedings for two properties adjacent to the Benton County Jackson-Frazier Wetland, which have recently come into Benton County ownership. The affected properties are identified as Township 11 South, Range 5 West, Section 13, Tax Lot 102 and Section 24, Tax Lot 600; and

WHEREAS, the requested action would change the properties' designation on the Benton County Comprehensive Plan Map from Agriculture to Significant Public Lands, and would change the properties' designation on the Benton County Zoning Map from Exclusive Farm Use to Open Space; and

WHEREAS, the Benton County Planning Commission held a duly advertised public hearing on March 15, 2005, and voted to recommend that the Board of Commissioners approve the Zoning Map Amendment and Comprehensive Plan Map Amendment and adopt the revised Jackson-Frazier Wetland Management Plan as a background document to the Comprehensive Plan; and

WHEREAS, the Benton County Board of Commissioners held a duly advertised public hearing on April 5, 2005, to consider the Comprehensive Plan and Zoning Map Amendments; and

WHEREAS, the Board of County Commissioners finds that the proposed Map Amendments comply with the criteria of Benton County Code 53.505 through 53.525 and Oregon Administrative Rules 660-004-0018, 660-004-0028 and 660-012-0060, and are consistent with the applicable policies and procedures of the Comprehensive Plan; and

WHEREAS, the Benton County Board of Commissioners has considered the staff report, the application materials, the testimony of witnesses, the recommendation of the Benton County Planning Commission, and the record as a whole. The Board of Commissioners deliberated and approved the application for a Comprehensive Plan Map and Zoning Map Amendment and adoption of the revised Jackson-Frazier Wetland Management Plan as a background document to the Comprehensive Plan, and conducted the First Reading of the proposed Ordinance on April 5, 2005; and

WHEREAS, the Benton County Board of Commissioners held the Second Reading of the proposed Ordinance on April 19, 2005.

NOW THEREFORE, THE BOARD OF COUNTY COMMISSIONERS OF BENTON COUNTY ORDAINS AS FOLLOWS:

PART I: Short Title. Amendments to the Zoning Map and Comprehensive Plan Map and adoption of the revised Jackson-Frazier Wetland Management Plan as a background document to the Comprehensive Plan.

PART II: Authority. The Board of County Commissioners of Benton County has authority to amend the Zoning Map and Comprehensive Plan Map pursuant to ORS Chapter 215 and the Benton County Charter.

PART III. The Zone Change Application No. LU-05-005 is hereby approved, based on the Findings and Conclusions contained in the attached "Exhibit 3" and hereby adopted and incorporated herein.

PART IV. Benton County Comprehensive Plan Map is hereby amended to identify as "Significant Public Lands" the parcel described on the attached "Exhibit 1". This parcel is also shown on the map in "Exhibit 2".

PART V. Benton County Zoning Map is hereby amended to identify the parcel described on the attached "Exhibit 1" as "Open Space". This parcel is also shown on the map in "Exhibit 2".

PART VI. The revised Jackson-Frazier Wetland Management Plan attached as "Exhibit 4" is hereby adopted as a background document to the Benton County Comprehensive Plan.

PART VII. The effective date for these amendments to the Benton County Comprehensive Plan Map and Zoning Map will be:

First Reading: April 5, 2005

Second Reading: April 19, 2005

Effective Date: May 19, 2005

BENTON COUNTY BOARD OF COMMISSIONERS

Chair

Commissioner

Commissioner

Approved as to Form:

3-28-05

County Counsel

Recording Secretary

Exhibit 1

Legal Description of Zone Change Areas
Jackson-Frazier Zone Change; File No. LU-05-005

Property 1:

A tract located in the Government Lot 2, Section 24, Township 11 South, Range 5 West, in the County of Benton and State of Oregon, described as follows: Beginning at a point 39.00 chains East of the Southwest corner of William Knotts Donation Land Claim Number 45, Township 11 South, Range 5 West, Willamette Meridian; thence South 24 degrees West 4.50 chains to the North line of the Archimedes Stewart Donation Land Claim Number 46, Township 11 South, Range 5 West; thence East along the North line of said Stewart claim 850 feet more or less to the Southwest corner of the first tract described in deed recorded in Book G, Page 125, Deed Records; thence North 3.88 chains to the Northeast corner of said tract which is also the South line of the aforesaid Knotts Claim; thence West along the South line of said Knotts Claim 650 feet more or less to the point of beginning.

Property 2:

COMMENCING AT A 3-1/4 INCH BRASS CAP AT THE SOUTHEAST CORNER OF THE ABRAM N. LOCKE DONATION LAND CLAIM No. 41 IN TOWNSHIP 11 SOUTH, RANGE 5 WEST, SECTION 13 OF THE WILLAMETTE MERIDIAN, BENTON COUNTY, OREGON, SAID BRASS CAP BEING ON THE NORTH LINE OF THE WILLIAM KNOTTS DONATION LAND CLAIM No. 45; THENCE ALONG SAID KNOTTS NORTH LINE NORTH 89°14'52" WEST 556.03 FEET TO A 5/8 INCH IRON ROD AT THE NORTHWEST CORNER OF THAT PROPERTY CONVEYED TO KYLE L. DUNNING AND HOLLY J. DUNNING AS DESCRIBED IN BENTON COUNTY DEED RECORD M-236078-97; THENCE ALONG SAID DUNNING WEST LINE SOUTH 6°04'29" WEST 1468.78 FEET TO A 5/8 INCH IRON ROD AT THE TRUE POINT OF BEGINNING; THENCE CONTINUING ALONG SAID WEST LINE SOUTH 6°04'29" WEST 702.00 FEET TO A 5/8 INCH IRON ROD ON THE NORTH LINE OF THE SOUTH HALF OF THE EAST HALF OF THE KNOTTS CLAIM; THENCE ALONG SAID NORTH LINE SOUTH 89°30'33" EAST 910.60 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 36°00'33" WEST 79.91 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 23°33'00" WEST 250.00 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 44°01'00" WEST 107.50 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 36°14'00" WEST 276.00 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 85°54'30" WEST 230.50 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 72°40'00" WEST 161.50 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 40°00'00" WEST 105.00 FEET TO THE TRUE POINT OF BEGINNING.

Exhibit 2

Map of Zone Change Areas

Jackson-Frazier Zone Change; File No. LU-05-005

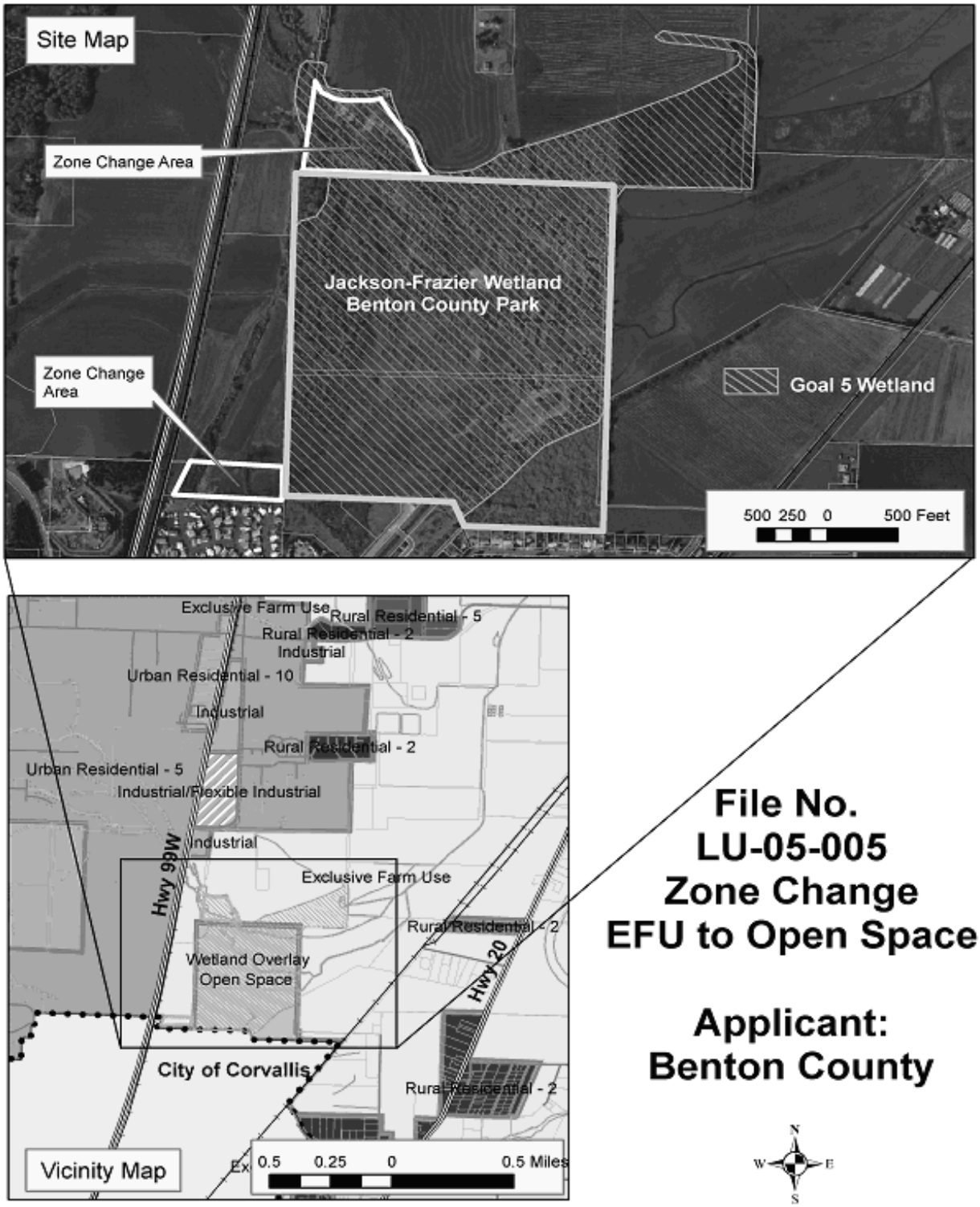


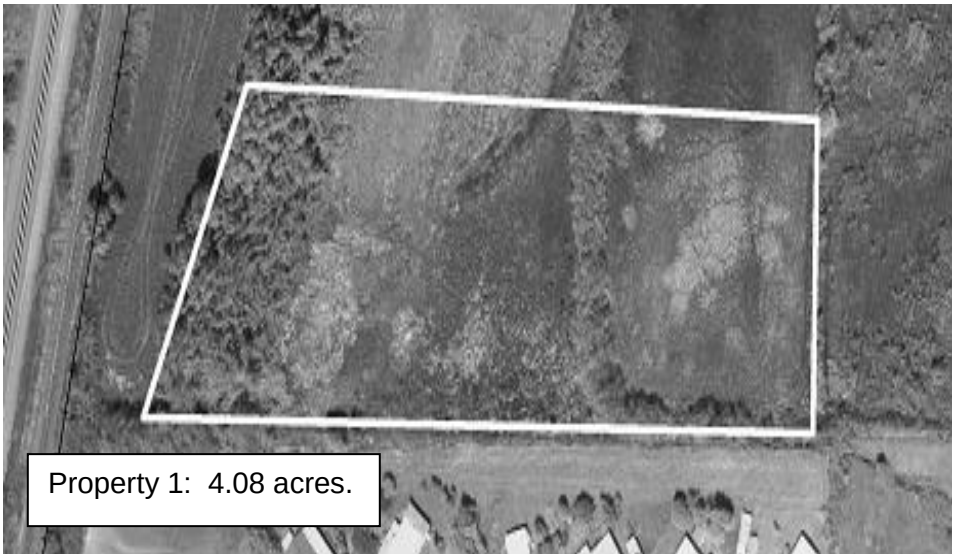
Exhibit 3

Findings of Fact and Conclusions of Law
Jackson-Frazier Zone Change; File No. LU-05-005

A. GENERAL FINDINGS

1. The proposed zone change involves two areas of land directly adjacent to the current Open Space zoning of Jackson-Frazier wetland. The two areas were acquired by Benton County after 1991, which is when the Open Space zone was applied to the County-owned portion of the Jackson-Frazier wetland.

2. Property 1 (4.08 acres) is located directly west of the southwest corner of the current Open Space zoning. This property was acquired by Benton County in 2003 from the Greenbelt Land Trust. The property is zoned Exclusive Farm Use, does not have the Goal 5 Wetland Overlay, and is encumbered by a conservation easement in favor of the Greenbelt Land Trust. The easement prohibits: alteration of vegetation (except for habitat enhancement), hydrology or topography; development, construction or land division; filling; and many other activities that could impact the wetland. The property was donated to the Greenbelt Land Trust in 1999.



3. A 2002 wetland delineation of Property 1 identified 3.32 acres of wetland (81% of the property). The property is located directly north of a mobile home park inside Corvallis city limits. To the north and west is land owned by the City of Corvallis and zoned Exclusive Farm Use.

4. Property 2 (9.60 acres) is located north of the northwest corner of the current Open Space zoning. This property was acquired by Benton County in 2001 through a property line adjustment. The property was gifted to Benton County by Kyle and Holly Dunning in exchange for a density bonus (an increase in the allowable number of lots) for their subdivision (Pinot Gris subdivision, located approximately one-half mile to the north). Property 2 is zoned Exclusive Farm Use. It also has been designated with the Goal 5 Wetland Overlay that applies to the County-owned portion of the Jackson-Frazier wetland.

5. Property 2 is largely or completely wetland (staff is not aware of a delineation for the property). It was included in the significance determination and ESEE analysis adopted

in 1991, which resulted in the establishment of the Goal 5 Wetland Overlay on this property. To the north and east is land zoned EFU and owned by the Dunnings. To the west is land zoned EFU and owned by the Greenbelt Land Trust.

6. The Jackson-Frazier Management Plan was developed by a task force and adopted by Benton County in 1992. A refinement of that management plan has now been prepared by Dr. Robert Frenkel (chair of the Jackson-Frazier Wetland Technical Advisory Committee) and David Reed (planning consultant). The refined management plan was developed with input from the Jackson-Frazier Wetland Technical Advisory Committee, Benton County staff, the Greenbelt Land Trust, and other interested persons and organizations.

7. The objectives of the revised management plan are to:

- Provide policies and associated implementation recommendation guiding public use of the wetland for education, recreation, and research without damaging the resources.
- Identify acceptable and feasible management practices for restoration.
- Direct Benton County's relationship with neighboring property owners in protecting resources upon which Jackson-Frazier Wetland is dependent.
- Coordinate with the City of Corvallis and public groups in furthering a comprehensive parks and open space network.

8. The management plan identifies eleven policy areas that will guide management decisions, covering in general terms issues including: protection, restoration, management, personal well-being, recreation, education, research, connectivity, off-site partnering, volunteers, and land acquisition. (see pages 39-42) Twenty-four implementation measures are specified (pages 43-47).

9. The management plan proposes no major changes in public use, or in development of the site beyond the existing gateway, boardwalk, and interpretive signs. Under the management plan, the area zoned as Open Space will remain in an essentially undeveloped state.

B. FINDINGS APPLYING DEVELOPMENT CODE CRITERIA and COMPREHENSIVE PLAN POLICIES

Statewide Planning Goal 3 (Agricultural Lands) and its implementing administrative rule (OAR 660-033) identify uses, which can be allowed on land meeting the goal's definition of agricultural land. The proposed zone (Open Space) allows some uses that are not allowed on high-value farmland under Goal 3: golf courses; private parks, recreation areas, hunting or fishing preserve, campground or playground. The Jackson-Frazier site contains approximately 86 acres of high-value soils and 57 acres of non-high-value soils; therefore, the site is considered high-value farmland. Thus, many of the uses allowed in the Open Space zone are not consistent with Goal 3. However, when the Open Space zone is applied to a property, a management plan for the property is adopted simultaneously. The list of uses allowed in that Open Space zone is then further limited to the uses contained in the adopted management plan for the site. Therefore, if the proposed management plan limits uses to uses allowed under Goal 3, then the Open Space zoning is consistent with Goal 3 and no goal exception is necessary.

Findings: The Jackson-Frazier Management Plan proposes passive, day-use recreation activities limited to walking the boardwalk, photography, nature study, bird watching and similar activities. Picnic facilities are not provided, nor are sports facilities. Hunting, trapping and firearm use are prohibited. Off-boardwalk use is only allowed through a special use permit for purposes such as supervised field trips, professional training, educational and management activities. The management plan authorizes none of the uses allowed under the Open Space zone but not allowed under Goal 3. In the future, a change to the management plan requires adoption of the revised plan through a zone change procedure; if a use then proposed were to be inconsistent with Goal 3, an exception would be required at that time.

Conclusion: The proposed use is consistent with Goal 3. **No goal exception is necessary.**

53.505 Zone Change Criteria. The Official Zoning Map may be amended if:

(1) The proposed zoning for the property is more appropriate than the current zoning, when considering existing uses, changes in circumstances since the current zoning was applied, or information that indicates that the current zoning was not properly applied;

Findings: The current zoning of these two properties is Exclusive Farm Use (EFU). Property 2 also has a Goal 5 Wetland Overlay zone applied to it. The EFU zoning restricts many forms of intensive development; however, a wide range of uses is potentially allowed within the EFU zone, some of which would be incompatible with preservation and management of a sensitive natural resource like Jackson-Frazier Wetland.

The proposed Open Space zone[1] further restricts the uses allowed, by limiting them to uses authorized by both the Open Space zone description and the management plan for the site. The management plan has been developed specifically to preserve and manage the sensitive natural resource found here.

The circumstances that have changed since the EFU zoning was applied in 1982 is that the two properties have come into public ownership. Prior to that happening, the private owners were apparently not interested in re-zoning the land. Now, the owner (Benton County) desires the land to be re-zoned.

Analysis and conclusion: The Open Space zoning designation will distinguish this property from the neighboring areas, and draw attention to the fact that it will be managed differently from those other lands. Furthermore, this zone change provides a formal process for review and adoption of the management plan for the property, and makes that plan binding. The management plan is essential for preservation of the wetland resource. **The Board of Commissioners concludes Open Space is a more appropriate zoning designation than Exclusive Farm Use for the subject property. This criterion is met.**

(2) The impact on adjacent properties will be minimal;

Findings: The proposed zone will result in a more limited set of possible uses than is currently allowed under the EFU zoning. The allowed uses are designed toward appropriate management of the natural resource. Public access to the proposed zone change properties will be very limited – by special use permit only. Existing public access to the Jackson-Frazier boardwalk area will continue; the proposed zone changes are not anticipated to affect the level of use of the park. The management plan has been presented at a public meeting to which neighboring property owners were invited. Those same people were provided notice of the Planning Commission hearing, and to date no comments have been received.

Conclusion: The proposed re-zoning subject to the management plan will result in minimal negative impacts to neighboring property owners. **The Board of Commissioners concludes this criterion has been met.**

(3) Any significant increase in the level of public services which would be demanded as a result of the proposed zone change can be made available to the area; and

Findings: The proposed zone change areas will not require any public services. For the existing Open Space zoning, the proposed management plan does not call for changes in management that would require additional public services.

Conclusion: This criterion is met.

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[1] The purpose of the Open Space zone is as follows: *The Open Space Zone shall preserve and protect natural, scenic, or recreational resources by managing such resources primarily for open space and recreational purposes. The Open Space Zone shall only be applied upon application of the property owner.* [BCC 61.005]

(4) The proposed zone change is consistent with the policies of the Comprehensive Plan.

Findings: The Board of Commissioners has identified the following Comprehensive Plan policies as relating to the proposed zone change.

Fresh Water Marshlands:

97. This once abundant habitat is now rare in the Willamette Valley and requires protection where it occurs in its natural condition. Fill or grading operations within or near a marsh, or activities that decrease the source water to the marsh, should be prevented.

Findings: The proposed Management Plan, and the zone changes that will bring additional land under the management plan, will increase protection for freshwater marshlands and the source water for the marsh. This will occur both through on-site management as well as collaborative efforts with watershed property owners as called for in the plan.

Significant Natural Areas Policies

115. Benton County shall cooperate with other agencies and organizations to identify and protect natural areas recognized for significant scientific or educational purposes.

Findings: Jackson-Frazier Wetland has been identified as having significant scientific and educations value. The proposed zone changes and management plan protect the site as a natural area.

121. Benton County shall limit uncontrolled access to, and use of, natural areas as necessary to preserve valued character. For detailed policies see the Parks and Recreation and Open Space sections of the Comprehensive Plan.

Findings: The management plan limits public access to Jackson-Frazier wetland to the boardwalk section, except by special use permit for supervised educational or scientific purposes.

122. The County shall use zoning or other techniques to provide adequate buffer areas as needed around natural areas.

Findings: The lands adjacent to the proposed zone change areas are either zoned Exclusive Farm Use or are located inside the city limits of Corvallis. The EFU zoning is an appropriate buffer zone for this natural area. The County does not have zoning authority over the land inside city limits.

123. With a well-planned Natural Area Program underway, Benton County Parks or a land trust should provide environmental education services, make these lands available for (non-destructive) scientific research, and provide passive recreation opportunities.

Findings: The Jackson-Frazier Wetland management plan provides for educational and scientific research opportunities. Passive recreation is also allowed. However, these activities are limited as necessary to preserve the integrity of the natural area.

158. The Jackson Frazier Wetland and significant natural area shall be protected as a designated Goal 5 resource as documented in the Comprehensive Plan Background Report. The protection program shall consist of a Wetland Overlay Zone designation for the 147 acre inventoried wetland and a Open Space Zone designation for the 130.6 acre parcel currently owned by Benton County. The Overlay zone shall provide for activities which are consistent with the protection and enhancement of the natural area values. [Ord 91-0083]

Findings: Property 2 is designated with the Goal 5 Wetland Overlay, while Property 1 is not. However, both will be protected pursuant to the management plan. The management plan specifies protection and enhancement methods.

159. The County recognizes the lack of intentional wetland management as a continuing threat to the Jackson-Frazier Wetland. The County commits to the implementation of a Specific Management Plan which prescribes wetland management measures as an element of a Goal 5 Protection Program. The Specific Management Plan, entitled the Jackson-Frazier Wetland Management Plan, is incorporated into the Background Report for the Natural Resources and Hazards Element of this Plan. The County shall review and update the Management Plan as part of periodic review of the Comprehensive Plan. [Ord 91-0083, 92-0095]

Findings: The proposed management plan is an update of the original, and prescribes wetland management measures.

Conclusion: The Board of Commissioners concludes that the proposed zone changes and management plan are consistent with Benton County Comprehensive Plan policies. **This criterion is met.**

C. FINDINGS FOR AMENDING THE COMPREHENSIVE PLAN MAP

Benton County Comprehensive Plan, Chapter V, Criteria for Amendments:
Map amendments may be considered when compliance with all elements of the Comprehensive Plan and with statewide land use planning goals can be shown and a public need exists for the proposed amendment.

Findings: The proposed Comprehensive Plan Map amendment would change the designations of Property 1 and Property 2 from Agriculture to Significant Public Lands. The previous sections of the staff report have shown that these changes comply with applicable Comprehensive Plan policies and statewide planning goals. Preservation and enhancement of Jackson-Frazier Wetland provides several public benefits, including water quality, recreation, education, and aesthetics.

The Board of Commissioners concludes this criterion has been met.

D. FINDINGS APPLYING TRANSPORTATION PLANNING RULE

OAR 660-012-0060
Plan and Land Use Regulation Amendments

(1) Amendments to functional plans, acknowledged comprehensive plans, and land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and performance standards (e.g. level of service, volume to capacity ratio, etc.) of the facility. This shall be accomplished by either:

(a) Limiting allowed land uses to be consistent with the planned function, capacity, and performance standards of the transportation facility;
(b) Amending the TSP to provide transportation facilities adequate to support the proposed land uses consistent with the requirements of this division;
(c) Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes; or
(d) Amending the TSP to modify the planned function, capacity and performance standards, as needed, to accept greater motor vehicle congestion to promote mixed use, pedestrian friendly development where multimodal travel choices are provided.

(2) A plan or land use regulation amendment significantly affects a transportation facility if it:

(a) Changes the functional classification of an existing or planned transportation facility;
(b) Changes standards implementing a functional classification system;
(c) Allows types or levels of land uses which would result in levels of travel or access which are inconsistent with the functional classification of a transportation facility; or
(d) Would reduce the performance standards of the facility below the minimum acceptable level identified in the TSP.

Findings: The proposed zone changes, Comprehensive Plan Map changes, and management plan are not anticipated to result in increased traffic.

Conclusion: These criteria do not apply.

E. SUMMARY AND CONCLUSION

The Board of Commissioners' findings and conclusions are:

1: The proposed zone changes and management plan are consistent with Goal 3 (Agricultural Lands); therefore, no goal exception is required.

2: The proposed zone changes are consistent with the applicable Development Code criteria and Comprehensive Plan policies.

3: The proposed amendment to the Comprehensive Plan Map is consistent with the criteria from the Comprehensive Plan.

4: The criteria of the Transportation Planning Rule (OAR 660-012-0060) do not apply.

The criteria for Zoning Map and Comprehensive Plan Map amendments are met. Therefore, the Board of Commissioners approves the request.

An abandoned county roadway is located along the western property boundary.

Soils and Vegetation- According to soil maps (SCS 1975) the majority of the site contains Dayton and Bradshaw soils. Both of these soils are classified as hydric. Dayton soils predominate on the west portion of the property and Bradshaw soils predominate on the east. A small area of Amity soils may intrude on the western edge of the property near the uplands. Amity soils are not considered hydric but may have hydric soil inclusions.

A mixture of wetland types are present on the property. The predominant wetland type is palustrine emergent wetland with a smaller area of palustrine scrub-shrub wetland present along the central south flowing ditch across the property. These wetland areas are detailed in the Wetland Determination on file with the GLT and Benton County.

Loverna Wilson, wetland ecologist noted that the five different wetland areas present on site contain a mixture of plant species. The 3 emergent wetland areas contain rushes, sedges, and a mixture of grass species including tall fescue, slough grass, meadow foxtail and reed canary grass. An area in the center of the property contains a large cattail marsh. During a GLT site visit in late spring 2002 it was observed that this area also had quite a few iris plants mixed in with the cattails.

Tufted hairgrass was observed along the eastern portion of the site and a large depression along the northeast edge of site contains creeping bulrush. A willow dominated shrub scrub community follows the central south flowing ditch across the property. There was also a dense population of mountain tarweed in the southeast corner of the site.

There is a small area of upland contained within the old county roadway and adjacent land. This area contains a mixture of grasses that were different than the adjacent lower areas. The area also contains poison oak, Oregon ash, scattered apple trees, and blackberry.

In general the soils, vegetation, and hydrology appear to be similar to the adjacent emergent wetland in the Jackson Frazier Wetland.

BEFORE THE BOARD OF COMMISSIONERS
FOR THE STATE OF OREGON, FOR THE COUNTY OF BENTON

In the Matter of Naming the Bob Frenkel Boardwalk at the Jackson-Frazier Wetland	)))	**ORDER# D2005-033**

THE ABOVE ENTITLED MATTER COMING NOW FOR THE

CONSIDERATION OF THE BOARD AND,

IT APPEARING TO THE BOARD

THAT Benton County constructed a boardwalk at Jackson-Frazier Wetland; and

THAT Bob Frenkel has been the foremost, tireless, dedicated, sustaining leader and advocate for Jackson-Frazier Wetland through many years; and

THAT the Benton County Natural Areas and Parks Advisory Board was consulted, and by consensus, recommends that the County name the boardwalk the "Bob Frenkel Boardwalk;" and

THAT the County is the appropriate agency to formally establish a name for the facility.

NOW, THEREFORE, IT IS HEREBY ORDERED that the Benton County constructed boardwalk at Jackson-Frazier Wetland, be named the "Bob Frenkel Boardwalk."

Adopted this **5th** day of **April, 2005.**

Signed this **5th** day of **April, 2005.**

BENTON COUNTY
BOARD OF COMMISSIONERS

Annabelle Jaramillo, Chair

Jay Dixon, Commissioner

Linda Modrell, Commissioner

APPENDIX 2
Management Issues

Issues addressed in the management plan were identified by the 1992 Task Force, input during a May 4, 1992 public meeting, Benton County Natural Area & Parks Department staff, and Jackson-Frazier Wetland Technical Advisory Committee members. Many issues listed in the 1992 plan have already been addressed and are no longer relevant. Listed below are selected issues, grouped by topic, that are pertinent to the management of Jackson-Frazier Wetland.

Management Goals

- ♦ Degree/intensity of management
- ♦ Type and intensity of allowable public uses
- ♦ Conflicting goals
- ♦ Preferred management concept
- ♦ Determination of management units

Administrative Structure

- ♦ Relation of Technical Advisory Committee to the Benton County Natural Areas & Parks Department

Vegetation Management

- ♦ Delineate management units
- ♦ Control of non-native invasive species
- ♦ Management of invading native trees and shrubs (natural succession)
- ♦ Restoration of historically disturbed plant communities toward target communities
- ♦ Best and most feasible management techniques to meet vegetation management objectives

Restoration

- ♦ Determine the restoration goal
- ♦ Determine what, where, and how to restore wetland resources
- ♦ Determine the most appropriate restoration techniques
- ♦ Determine priorities for restoration
- ♦ Monitor restoration
- ♦ Involve public and students in restoration efforts
- ♦ Publicize restoration activities

Hydrology

- ♦ Upstream watershed land uses that affect site hydrology
- ♦ External watershed hydrology
- ♦ Internal hydrology
- ♦ Monitoring and management of internal wetland hydrology
- ♦ Restoration of "pre-disturbance" hydrology in the wetland

Public Use

- ♦ Range of permitted and restricted uses
- ♦ Appropriate recreational uses and facilities
- ♦ Appropriate educational activities and facilities
- ♦ Research activities
- ♦ Level of public use that is consistent with wetland protection
- ♦ Limits on active recreation as a public use
- ♦ Linkages to other County/City trails
- ♦ Monitoring human use impacts
- ♦ Public use conflicts with other management goals
- ♦ Access point(s)
- ♦ Parking

Wildlife Management

- ♦ Information and research needs
- ♦ Control of potential "pest" species
- ♦ Dogs and dog waste

Adjoining Land Uses, Connectivity, Adjacent Ownerships, and Partnering

- ♦ Geographic scope of management plan, including recommendations related to adjoining land and watershed
- ♦ Adjacent and upstream land uses affecting wetland management options and decisions
- ♦ Effect of wetland management options on adjacent landowners
- ♦ Partnering with adjacent land owners (City, **Greenbelt Land Trust**, private owners)
- ♦ Working with W&P Railroad and Oregon Department of Transportation to secure a linkage to the west

Other

- ♦ Information and research needs
- ♦ Information-based management decisions
- ♦ Monitoring wetland and adjusting management if needed
- ♦ Experimental approach to management where information lacking

Recommended Implementation Measures

With reference to Policy 3. *Management* and Policy 6. *Education*

Implementation Measure 1

Prepare, condense, and publicize information in this revised management plan in the form of a public information brochure brief that can be circulated and displayed on the Jackson-Frazier Wetland website.

Implementation Measure 2

Jackson-Frazier Wetland shall be managed by an integrated management strategy incorporating a variety of methods meeting a variety of objectives.

Relates to Policies 1. *Protection*, 2. *Restoration*, and 3. *Management*

Implementation Measure 3

Jackson-Frazier Wetland shall be stratified into management units, each reflecting relatively similar ecological environment, restoration potential, and public use characteristics.

Relates to Policies 3. *Management* and 2. *Restoration*

Implementation Measure 4

Manage boardwalk and trailside vegetation by following the standard operating procedure in Appendix 10.

Relates to Policies 1. *Protection*, 2. *Restoration*, 4. *Personal Well-Being*, and 10. *Volunteers*

APPENDIX 3
Restoration

The idea of restoring damaged landscapes and ecosystems dates to ancient times and today is closely associated with landscape protection and conservation programs, typically focusing on repair and renovation of damaged ecosystems, natural processes, and even entire landscapes. It is an accepted premise that restoration does not mean that one can restore an ecosystem or landscape to its former characteristics. Restored systems almost *always bear a legacy of the past*. One can never get back to pristine conditions.

The following steps are common in restoration programs:

1. Identifying the restoration target; its condition and desired outcome
2. Determining feasibility of restoration
3. Identifying steps needed for restoration
4. Implementing restoration
5. Monitoring restoration

Need to Restore Jackson-Frazier Wetland
Through agricultural drainage, alteration, dam building, and urbanization, the Willamette Valley watershed has lost about 57 percent of its historic wetlands. Some wetland plant communities, such as the tufted hairgrass community, have been diminished by more than 90 percent. Most remnant wetlands have been fragmented and/or isolated from their water source. Few relatively large intact wetlands remain. Jackson-Frazier Wetland is an exception, yet it too has been greatly modified over 170 years of Euro-American exploration and settlement.

Although the wetland appears relatively intact to most visitors, almost every aspect of Jackson-Frazier Wetland has changed over the years, some aspects profoundly:

- Hydrological changes (ditching, diking, drainage modification, shallow pond excavation, altered water inflow)
- Vegetation changes (loss or reduced rare plant populations, alien plant introductions including invasives, altered plant communities)
- Major changes in animal assemblages through habitat change, local loss, or diminished populations
- Alterations in critical external ecosystem influences such as fire and grazing, shifts in human use, and climate change

Recognition of these alterations and the need to repair the wetland has led the Technical Advisory Committee to formulate a general restoration policy for Jackson-Frazier Wetland to:

> ***…restore damaged wetland resources to an historically documented state prevailing at Euro-American settlement time where technically and economically feasible using the least intrusive methods available and serving as a model project.***

The Natural Area & Parks Department and Technical Advisory Committee, in preparing the management plan, are aware that many important external and deleterious influences are beyond Benton County's control. Also, it is apparent that several wetland elements cannot feasibly be restored. Major elements for restoration activity are addressed below.

Prairie Restoration

The 1853 Township and Range survey shows that almost all of Jackson-Frazier Wetland was open wet prairie. Currently, 75 percent of the area, although still wetland, is either covered by young ash forest or tall shrub vegetation (Jones 1999). Because the area is the potential habitat for populations of listed Bradshaw's lomatium and Nelson's sidalcea, and because native wet prairie is quite rare, about 30 acres of Jackson-Frazier Wetland in the southwest quadrant have been designated for prairie restoration (Map 6).

Several restoration strategies were considered. Among these strategies was to return this management unit to open wet prairie by:

1. repetitive mowing and spot herbicide application to simulate periodic Native American burning and wild animal grazing
2. repetitive broadcast (open field) burning
3. combined periodic mowing and burning
4. deadening existing invasive and native vegetation, grading, and replanting with native wet prairie species
5. introducing disturbance by grazing, possibly combined with mowing and/or burning

The reasons for these strategies are that the historic Willamette Valley wet prairie was an unstable vegetation type and depended on periodic disturbance for its perpetuation. Aboriginal occupants burned prairies at an undetermined frequency and intensity to favor their food sources. In the absence of this disturbance, prairie undergoes natural succession to ash forest; apparently the regionally stable vegetation (i.e., "climax"). Prairie restoration necessarily requires some form of periodic disturbance.

Mixed Wetland Forest-Shrub Restoration and Protection

Most of the Jackson-Frazier Wetland is "Mixed Wetland Forest-Shrub," a complex of maturing Oregon ash woodland interspersed by dense successional scrub dominated by willow, hawthorn, and rose (Map 6). Natural Areas & Parks staff and the Technical Advisory Committee judged returning the entire 100-acre area to open wet prairie as impractical. Instead, the staff and committee recommend allowing natural succession to

proceed toward an ash forest. Within this vegetation mix, however, there are several patches of open herbaceous plant covers, some dominated by slough sedge and others covered by dense stands of water parsley. These small open patches of native vegetation are valuable and deserve protection and restoration. In this instance, selective removal of trees and shrubs by cutting and applying herbicide to prevent regrowth may be locally required.

Public Use Unit Management

The Public Use Unit encompasses approximately 13 acres within and surrounding the boardwalk loop that effectively displays different wetland types (Map 6). Management of this unit will be focused on highlighting habitat diversity and providing the visitor an attractive, interesting educational experience. Both restoration and management activities will be aimed at resource enhancement, as well as protecting and displaying different wetland types. Consideration will be devoted to providing privacy and interest for visitors as they circulate along the boardwalk. Visual quality is a key element of this zone requiring trimming and mowing of boardwalk margin vegetation at least twice a year. This is important for safety reasons as well as for aesthetic considerations. Attention will also be paid to careful removal of isolated trees in order to open up views of the adjoining prairie. Consideration will be paid to the disposal of removed vegetation debris following protocol outline in Appendix 10. Wet prairie vegetation within this zone will be restored using the same strategies identified for the larger adjacent prairie. Shrub and forest vegetation will be managed to allow natural succession to take place. Alien reed canarygrass that dominates the large area within the boardwalk loop will be targeted for removal or control.

County Reserve Unit

The 13-acre triangular upland parcel southeast of the wetland was farmed until the 1970s and has since reverted to blackberry thickets surrounded by a narrow fringe of invasive trees that grow along a former fence line (Map 6). Further to the southeast a single row of private residences line Canterbury Drive. The reserve unit buffers the wetland and the private properties. A 20-foot mowed strip adjacent to the rear yards of the residences serves as a firebreak.

Recommended Implementation Measures

With reference to Policies 2. *Restoration* and 6. *Education*

Implementation Measure 5

Prepare and publicize information on restoration activities.

Implementation Measure 6

Restore the *Wetland Prairie Management Unit* to wet prairie dominated by native graminoid (grass-like) species by treating existing tree-invaded, shrubby, and graminoid vegetation using a combination of mowing, herbicide application, and burning.

Implementation Measure 7

Protect vegetation within the *Mixed Wetland Forest-Shrub Management Unit* and restore isolated patches of native open wetland vegetation by selective removal of nearby trees and shrubs by cutting and/or herbicide application.

Implementation Measure 8

Manage vegetation within the *Public Use Management Unit* for protection to provide the visitor with a diverse and educationally rewarding and satisfying experience. Methods will include selective removal of trees and shrubs for aesthetic reasons, mowing boardwalk edge vegetation, removal of hazard trees, careful disposal of removed debris, and an active program to control reed canarygrass within the boardwalk loop.

Implementation Measure 9

Maintain vegetation within the *County Reserve Management Unit* as a buffer separating private land from the County wetland. Treatment of the parcel near the residences shall focus on protecting adjacent property by regular fire line mowing. For the time being, no management will take place for the rest of the area, which serves to protect the adjacent wetland.

APPENDIX 4
Vegetation

Vegetation Pattern

Jackson-Frazier Wetland embraces five vegetation types: forested wetland, emergent wetland (sedge-rush prairie), shrub-scrub wetland, seasonally open water, and forested non-wetland. All are characteristic of the central Willamette Valley. These and more specific plant communities at Jackson-Frazier have been mapped by Marshall (1985).

Forested Wetland

Vegetation is dominated by Oregon ash (*Fraxinus latifolia*), a stable vegetation type in the Willamette Valley. Several ash-dominated communities in the Willamette Valley have been described by Frenkel and Heinitz (1988). Besides Oregon ash, other prominent species include Douglas hawthorn (*Crataegus douglasii)* and Piper willow (*Salix piperi)*. Historically, ash forest was well represented close to the Frazier Creek drainage in 1936, if not earlier (Jones 1998, Oregon Natural Heritage Program 2003).

Emergent Wetland

Particularly important is the emergent wetland (prairie) type, including a tufted hairgrass (*Deschampsia cespitosa*) plant community that is in very poor condition. Much of the type includes stands of sedge and rush. A small population of federally endangered Bradshaw lomatium (*Lomatium bradshawii*) is also found in the prairie. Vegetation cover has changed markedly over the past 170 years. At settlement time, Jackson-Frazier Wetland was primarily open prairie, reputedly dominated by tufted hairgrass (Oregon Natural Heritage Program 2003). In the absence of aboriginal burning followed by historical livestock grazing, forest and shrub-scrub have rapidly replaced prairie by natural plant succession (Jones 1998), a process accelerated by partial drainage in the 1920-30s. Lacking management intervention, much of Jackson-Frazier will probably become forested. The open herbaceous wetland vegetation west of the boardwalk was altered in 1985 by scraping by a prior owner, and in 2003 by mowing as a restoration measure.

Shrub-Scrub Wetland

This large area of successional vegetation is rapidly trending to ash forest but includes willow, hawthorn, and patches of wet prairie and is very diverse. Difficult to get around in, the type includes a number of plant communities and contains dense monotypic stands of slough sedge (*Carex obnupta)* (Marshall 1985).

Seasonally Open Water

Emergent wetland vegetation dominated by cattail and spike rush had dominated these very wet areas, but reed canarygrass recently invaded these shallow seasonal ponds. Some ponds were excavated as duck ponds in the 1930s. Seasonal beaver ponds occur in the northwest of the wetland.

Forested Non-Wetland
A very small hillock in the northwest part of the ownership is covered by upland vegetation dominated by large maple trees.

Management Alternatives
As early as 1992, the Jackson-Frazier Wetland Taskforce considered vegetation management in the wetland. Various options were considered then and these alternatives have been reassessed for this plan refinement. These are discussed below:

Manage the Wetland by Doing Nothing
Meeting objectives of a diversity of wetland vegetation types and meeting educational and public use objectives would be very low. By doing nothing (status quo), the vegetation trend toward an ash forest with various plant communities marking the understory would be very high. Jones' (1998) research supports this conclusion. From a Benton County Natural Area & Parks Department perspective, benefits would be minimal, but management costs would also be minimal other than protecting the wetland unit from fire. Public use would be difficult to achieve because of impeded access.

Periodically Open Burn Entire Wetland
Probability of meeting vegetative goals for all the management units is moderate, but probability of achieving some kind of spatial mosaic of vegetation types is high. The area naturally burns in a patchy manner. Arrangement of patches would be unpredictable. Burn frequency would have to depend on resulting vegetative and weather pattern. An advantage includes little internal disturbance to site. Open burning is the most natural and the best approach to achieve the natural area goals set for the wetland. Disadvantages include problems in conducting open field burning, air pollution, risk to surrounding property, high cost of conducting burns, and adverse public reaction.

Periodically Open Burn Just the Prairie Unit
Probability of meeting vegetative objectives is high. Burn frequency would be much lower for shrubby areas (10 years) vs. higher for prairie area (1-3 years). Advantage is gaining vegetative goals. Disadvantages including logistic complexity, high cost, high risk to surrounding property, difficulty in meeting air pollution requirements, site disturbance by fire lines and heavy fire fighting equipment, and adverse public reaction still exist but are fewer than with burning the entire site. From a management standpoint, this would be the most appropriate strategy toward achieving the goals, but the above disadvantages are substantial.

Selectively Mow 20 Acres in the Southwest Quadrant of the Wetland
Probability of long-term success of maintaining Forest-Shrub Unit is high, shrub-scrub low, and prairie moderately high, particularly if there were selective hand cutting of trees and stem application of herbicide. Advantages include achieving vegetative goals and reduced danger to property. Disadvantages include the possibility that mowing might not meet the ecological goals and/or needs of the species; the experimental nature of practice; site disturbance by equipment; cost, disposal of harvested material; and need for monitoring to assess efficacy of the method.

Selectively Graze about 70 Acres
Probability of maintaining forested sub area is high, shrub-scrub moderate, and prairie moderate, particularly if grazing were to be accompanied by selective hand cutting of trees and stem application of herbicide. Advantages include possibly achieving vegetative goals and less potential damage to surrounding property. Disadvantages include the possibility of not meeting ecological goals and/or ecological needs of the species and system; site disturbance by livestock such as introduction of aliens; soil compaction; fecal matter with water contamination; cost involved (problematic); need for intense monitoring; fencing costs; and the need to experiment with livestock selection – cattle, goats, sheep – and timing; logistic complexity (i.e., grazing contracts); and adverse public reaction.

Integrated Management
Given that the management of Jackson-Frazier Wetland is designed to meet multiple objectives, namely protecting the wetland and threatened and endangered plant species as well as maintaining public use (including passive recreation, education, research, and aesthetic enjoyment), a vegetation management program is needed that transcends the broad prescriptions described above. An *integrated management strategy* incorporating a variety of methods meeting a variety of objectives in different management units is called for. Such an integrated implementation was implied by the management perspective in the 1992 management plan and continues to be the present management perspective for the wetland.

APPENDIX 5
Threatened and Endangered Species

Background
Jackson-Frazier vascular flora was resurveyed in 1997-1998 by Richard Halse who identified 253 taxa (Appendix 12). Of these, 72 percent are native which is a large percentage of indigenous species but not surprising given this is mostly a wetland. Three species are federally and state listed as Threatened or Endangered – Bradshaw's lomatium (*Lomatium bradshawii*), Nelson's checkermallow (*Sidalcea nelsoniana*) and Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*). Since Jackson-Frazier Wetland is public land, special responsibility must be taken by the County to protect the species. The U.S. Fish and Wildlife Service has published recovery plans for Bradshaw's lomatium (Parenti et al. 1993), and for Nelson's checkermallow (U.S. Fish and Wildlife Service 1998). Kincaid's lupine, the host plant for the endangered Fender's blue butterfly, was listed as Threatened on January 25, 2000, together with the endangered butterfly and two other plant species. No recovery plan has been published. All of these species are also state-listed by Oregon Department of Agriculture Plant Conservation and Biology Program.

Bradshaw's Lomatium
Bradshaw's lomatium occurs in Jackson-Frazier Wetland in several small-scattered patches at the drier portions of the southern boundary of the wetland. Regionally, the species is restricted to seasonally wet areas and their immediate margins, in areas of shallow stream covered basalt, and along stream edges in the central and southern portion of the Willamette Valley and across the Columbia River. Throughout its range, it is known from only about two dozen sites, some of which are in public ownership and for which management plans can be, or have been, developed. Many sites and their populations have different characteristics. The habitat has been seriously depleted by agricultural, commercial and housing development over 150 years of settlement and continues to be so threatened. To maintain the species genetic pool, it is important to protect geographically and ecologically separated populations. For long-term population stability, it is regarded that at least ten separate populations of 2,000 flowering plants occupying at least 20 acres must be maintained. The Jackson-Frazier population, although very small and not vigorous, is a critical population to protect because of its geographic location (Parenti et al. 1993).

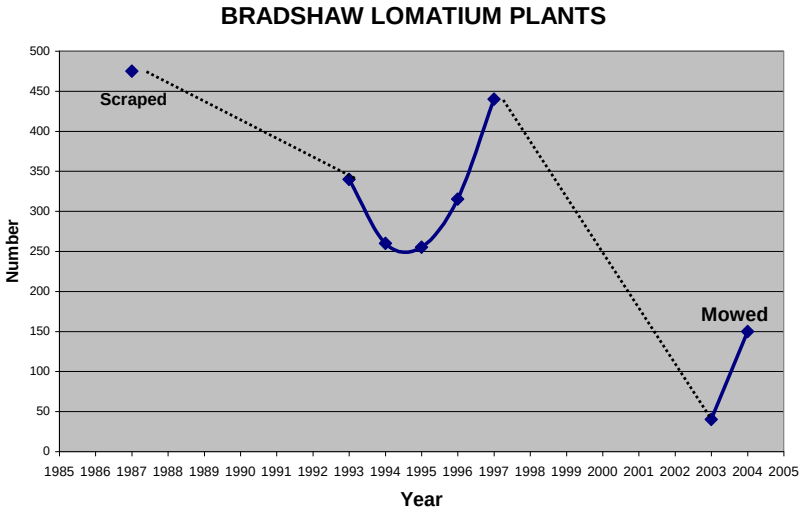
Principal threats are: (1) habitat destruction due to agricultural and urban development, (2) secondary succession in which competing herbs, shrubs, and trees shade and compete with lomatium, and (3) hydrological alteration. The two latter threats are present or potentially present at the Jackson-Frazier Wetland. Lomatium grows poorly in shade, producing fewer flowers and fruits than in sun, and therefore populations are threatened as grassland succeeds to shrub and forest. The species produces many more non-flowering individuals than flowering individuals, making inventories difficult and much variation in flowering from year to year. The species flowers in early April and senesces in late May. Considerable research has been conducted over the past decade on the best management practices for recovering Bradshaw's lomatium (Connelly and Kauffman 1991, Kaye 1992, Finley and Kauffman 1992, Pendergrass et al. 1999). All of these research projects suggest that

prescribed open burning improves the size and reproductive vigor of the populations. Mowing of competing herbaceous species may also enhance populations temporarily.

Monitoring at Jackson-Frazier Wetland

Jimmy Kagan of the TNC Natural Heritage Program was one of the first to observe lomatium at Jackson-Frazier Wetland. He counted the number of flowering plants in the year after the area was scraped. Tom Kaye, Institute for Applied Ecology, resurveyed the population from 1993 to 2003 (Kaye 2003), and the Technical Advisory Committee continue the resurvey in 2004 (see Figure below). Kagan and others reported that surface scalping in 1985 apparently increased number and vigor of plants but no inventory was carried out prior to 1987. From 1987 to 1994, the population diminished and then recovered to about 460 plants in 1997. Population then dropped to 40 plants in 2003. After mowing of the site in 2003, there was some recovery to about 150 plants in 2004. Apparently disturbance (i.e., scraping and mowing) enhanced the population. In 1997, the small population was fenced, eliminating pedestrian disturbance. This may have caused the drop in number of plants from 1997 to 2003.

Recovery



The U.S. Fish and Wildlife Service identified four actions:

1. set up a seed bank,
2. establish management areas,
3. enhance populations, and
4. monitor populations.

The last three actions can be taken at Jackson-Frazier Wetland. Parenti et al. (1993) in the U.S. Fish and Wildlife Service Recovery Plan, estimated 350 plants at Jackson-Frazier, with a target of 2000 plants occupying 20 acres. A site specific management plan is called for (Task 263 in Parenti et al. (1993)) and the current refinement of the 1992 Management Plan and this appendix addresses the issues raised USFWS Recovery Plan.

Recovery will, or has already, involved the following steps:

1. The 17 acre Wetland Prairie Management Unit is the identified management area (Task 242) and has been delineated.
2. Removal of the series of parallel tractor tracks created in 1985 is not feasible. The effect of tracks is to provide wetter depressions (often with standing water all winter and early spring) alternating with drier inter track linear habitat. The latter habitat appears suitable for Bradshaw's lomatium.
3. In preparation for a prescribed burn of this management unit in 2004, the area was mowed in 2003 by a rotary brush cutter at 3-4 inches (conducted by the U.S. Fish and Wildlife Service and by an outside contractor) under Oregon Partners for Fish and Wildlife Program 1448-13590-3-J067A. The three-fold increase in Bradshaw's

lomatium 2003-2004 may be attributed to this disturbance and/or less shading and competition.

4. A prescribed burn is scheduled for September 2004 under the direction of the Oregon Department of Forestry.
5. Mowing and prescribed burning should help remove debris and competing vegetation and give a competitive edge to the deeply tap-rooted and early flowering lomatium and together constitute enhancement action.
6. If the ongoing monitoring program that is being supervised by Tom Kaye shows improved population, the possibility of expanding the population in the management area will be explored.
7. The recovery area has already been protected from casual entry by a wire fence (erected in 1996) and rerouting all pedestrian traffic to the boardwalk. A special use permit controls school and researcher off-boardwalk entry, and all users are informed about the recovery program and are directed away from the high density lomatium areas.
8. The adjacent area of historic growth of lomatium is owned by the City of Corvallis. These external small populations are also monitored as part of the Benton County program. The City areas are mitigation sites and therefore not subject to development. Large areas of these sites are mowed in late June well after the lomatium senesces. The areas receive some light pedestrian traffic and much of the area is somewhat wetter than previously because grading in the attempt to create wet prairie.
9. Critical to a recovery plan is to continue the effort of locating new populations and documenting the with GPS locations that can be mapped. This has not been done to date.

Part 3 of the Parenti et al. 1993 Bradshaw's Lomatium Recovery Plan identifies the Implementation Schedule and the Responsible Party. Benton County is called upon to carry out the following tasks:

1. Task 2616, Determine human impact. This has been done but the *results have been negative*. All human traffic has been removed from the high density areas with the result of these not being impacted by casual pedestrian traffic. Competing and shading vegetation has gained the competitive edge, which has caused fewer flowering plants.
2. Task 263, Write a site specific management plan for each management area. With the completion of the recent refinement of the 1992 plan, this task is accomplished in the current plan, although only the Wetland Prairie Management Unit has a potential to recover Bradshaw's lomatium.
3. Task 264,Implement site specific management plan. The current Appendix 5 is the site specific plan called for in this plan and will be submitted as a separate document to the U.S. Fish and Wildlife Service Region One office.
4. Task 271, Establish permanent monitoring plots, photo plots, and sampling techniques. Kaye established permanent plots and a monitoring protocol in the early 1990s, but photo plots have not been established. The latter task will be carried out in spring 2005.
5. Task 272, Conduct periodic monitoring. Monitoring has been conducted since 1993.

From the above tabulation, the recovery plan appears to be substantially complete following the guidelines in Parenti et al. (1993), but the population has not recovered to any degree.

Nelson's Checkermallow

Although Nelson's checkermallow (*Sidalcea nelsoniana*), has been known to grow in a few scattered sites in Jackson-Frazier Wetland since the 1970s, it was not until 1993 that the plant was listed as a threatened species, and until 1998, when a recovery plan was published (U.S. Fish and Wildlife Service 1998). The plant is also listed as Threatened by the Oregon Department of Agriculture. Today, there are probably well over 70 population occurrences in the Willamette Valley and Oregon's northern Coast Range. The species is threatened throughout its range by encroaching successional species, largely because of fire suppression. It also is threatened by agricultural and urban development in lowland locations. Frequently, it is seen growing on road right-of-ways where it is threatened by road maintenance activities.

General objectives for delisting is to establish more than18 managed "reserves" with at least 0.12 acre occupied by a population. Jackson-Frazier Wetland (Map code 18) is identified as a population site with 3 m^2 occupied by the plant. Though Jackson-Frazier Wetland is a protected site, it does not yet qualify in any way as a managed reserve for the species because of the plant's local scarcity; nonetheless, Benton County must protect, and if possible, enhance, the plant at the wetland. Two reports discuss the status of Nelson's sidalcea at Jackson-Frazier Wetland, Kaye and Kirkland (1994) and Kaye (2003).

The plant produces a tall and showy spike, 1.6-5 feet tall with lavender to deep pink flowers (ca. 3/4 inch in diameter) on short stalks. Flowers may be female or perfect (male *and* female). Upper leaves are deeply divided, and basal leaves are shallowly palmate. Hairs on the stem and lower leaves are straight (*not forked or stellate*), an important distinguishing feature. Two other species may be locally confused with *Sidalcea nelsoniana* (i.e., *S. virgata* and *S. campestris*), but both have forked or stellate hairs.

Sexual reproduction is mostly accomplished by insects; self-pollination is not common. The fairly heavy seeds drop near the parent plant, but the plant is a sparse seeder. Asexual spread may occur from rhizomes. Plants at Jackson-Frazier Wetland mostly flower from mid June to mid July and do not survive well in wet soils or soils that remain flooded/fully saturated through April or very early May. The plant grows best in *open habitats* at the margins of streams and edges of woodland, in open woodlands, and along roadside embankments; however, weedy vegetation dominated by aliens often choke out sidalcea, an obvious problem at Jackson-Frazier Wetland. Opening up unshaded areas bare of competitive herbs may be critical for increasing the populations.

In a general survey of rare plants in Jackson-Frazier Wetland in 2003, Kay located only two populations in Jackson-Frazier Wetland and two additional plants on adjacent City properties. Frenkel had earlier, during 1998-2003, located four other populations that Kaye either missed or did not find because the populations had been extirpated. O'Malley, and later Frenkel, observed a population in the area that was mowed in 2003.

Recovery

Following the recommendations by the U.S. Fish and Wildlife Service (1998), major steps to be taken at Jackson-Frazier Wetland to protect and enhance Nelson's sidalcea are:

1. control encroaching trees and shrubs that shade existing sidalcea populations
2. reduce the effects of grasses and other competing herbs in order to enhance germination and growth
3. augment the seed bank by introducing seeds from nearby locations within several miles of Jackson Frazier Wetland
4. grow out and transplant plants from nearby locations paying close attention to plant sex to assure cross-pollination
5. avoid planting or seeding in sites that remain wet after mid April
6. initiate a survey to locate old populations and discover new populations and GPS locations

The Implementation Schedule of the U.S. Fish and Wildlife Service 1998 Recovery Plan for Nelson's sidalcea identifies "Implementation Tasks and the Responsible Parties" for carrying them out (see page 45 of the Recovery Plan). Benton County is called upon to carry out a number of tasks; however, there are four sites listed for which Benton County is responsible, one of which is Jackson-Frazier Wetland. For the purposes of this refined plan, it is assumed that Benton County Natural Areas & Parks Department is responsible for all listed tasks for the Jackson-Frazier site:

1. Task 1.2, Select a reserve site. Although Jackson-Frazier Wetland is unlikely to qualify as a reserve site, Jackson-Frazier Wetland is the only listed site that is protected and will be considered a potential reserve site.
2. Task 1.3, Delineate the reserve site. Although the Wetland Prairie Management Unit is managed by mowing and burning, it probably is not the most appropriate site. Selection and delineation of a reserve site will depend on the completion of an inventory for Nelson's sidalcea.
3. Task 1.51, Conduct a census. An initial inventory and census was conducted by Kaye (2004) but was incomplete. A more complete inventory is planned for the spring 2005.
4. Task 1.61, Reduce succession and competition threat. This will be initiated in 2004 and continued in 2005 for all populations.
5. Task 1.631, Procure seed. Discussions with the City of Corvallis, Institute for Applied Ecology, and Greenbelt Land Trust have already taken place to determine if seeds could be purchased.

At present time the major effort for recovery of Nelson's checkermallow at Jackson-Frazier Wetland has been in locating new populations and securing them by appropriate habitat modification, i.e., reducing shading and competition.

Kincaid's Lupine

In 1997 Dr. Richard Halse of Oregon State University reported a small population of Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*) established in a small area of upland in a fragment of remnant prairie at the northwestern edge of Jackson-Frazier Wetland, an elevated area sparsely wooded with oak and maple. Dr. Thomas Kaye revisited the site in 2003 and reported "a total of 28 clumps of plants with a total of 450 leaves and 3 inflorescences." Apparent threats include deer bedding down in the area, expansion of a nearby population of false brome (*Brachypodium sylvaticum*), an aggressive weed along with Himalayan blackberry. Other successional plants also threaten to over grow the population and/or shade it, thereby eliminating the population. Kincaid's lupine is the host for Federally endangered Fender's blue butterfly, which has not been observed on site (Kaye 2003).

Recovery

A recovery plan for this threatened plant has not yet been prepared by the U.S. Fish and Wildlife Service; however, management recommendations have been suggested by Kaye (2003) as follows:

- The prairie remnant habitat should be mowed and/or burned in the near future to improve species diversity and benefit Kincaid's lupine.
- The surrounding shrubs and adjacent trees should be removed to expand the potential prairie habitat, and increase light to the existing prairie patch.
- Noxious weeds (including false-brome and Himalayan blackberry) should be controlled immediately. Herbicides may be the most effective tool for reducing or eliminating false-brome. We suggest glyphosate be applied before seed maturation, or if application is delayed to after seed development, Fusilade should be considered. Two applications may be required. Note that mowing and burning do not appear to be useful methods of controlling this grass, as it resprouts vigorously. Himalayan blackberry may be controlled with frequent mowing, but application of Crossbow (or late summer use of glyphosate) may be less expensive and more effective.
- Seed collection at this site for Kincaid's lupine is not possible at this time due to the small size of the population and reproductive failure of the flowering stalks.
- Population augmentation with seeds or plants grown from seeds from nearby populations of Kincaid's lupine (for example, West Hills Road near Philomath, Benton County, Oregon) should be considered for this site, but only after vegetation management successfully expands the available habitat.
- Annual population monitoring of Kincaid's lupine should be initiated at this site to document population trends after habitat management begins.

The Benton County Natural Areas & Parks Department staff, with the advice of the Jackson-Frazier Wetland Technical Advisory Committee, plans to implement these measures in late 2004.

Recommended Implementation Measures

With reference to Policy 1. *Protection* and Policy 2. *Restoration*

Implementation Measure 10

Develop and implement a recovery plan for federal and state endangered Bradshaw's lomatium (*Lomatium bradshawii*) at Jackson-Frazier Wetland following tasks laid out by the U.S. Fish and Wildlife Service Recovery Plan for that species published in 1993.

Implementation Measure 11

Develop and implement a recovery plan for federal and state threatened Nelson's sidalcea (*Sidalcea nelsoniana*) at Jackson-Frazier Wetland following tasks laid out by the U.S. Fish and Wildlife Service Recovery Plan for that species published in 1998.

Implementation Measure 12

Implement the recovery plan recommended by Kaye (2003) for Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*) and identified in this Appendix 5 of the current management plan refinement.

APPENDIX 6
Alien and Invasive Plant Management

Background

Jackson-Frazier Wetland flora has a relatively low proportion of alien (or non-native) species. This is because wetlands are specialized habitats, and Jackson-Frazier Wetland has escaped major disturbance. Of 253 vascular species (trees, shrubs, and herbs) in the natural area, as described in Appendix 4, 30 percent are alien. This is quite a low percentage compared with Willamette Valley grasslands and open areas that commonly have 80 percent to 90 percent aliens. Only a few of these non-natives are regarded as "invasive," meaning that they aggressively replace other, often native, species. Three invasive species in particular – reed canarygrass (*Phalaris arundinacea*), False brome (*Brachypodium sylvaticum*), and Eglantine rose (*Rosa eglanteria)* – pose a danger to the wetland. Other important alien species are listed in Table 7. A brief discussion of the three most aggressive invasive plants follows.

Table 7.
Selected Alien Plants Posing Risk to Jackson-Frazier Wetland Flora

Species	*Common Name*	*Growth Form*	*Control Priority*
Brachypodium sylvaticum	False brome	Grass-like	High
Dipsacus sylvestris	Teasel	Forb	Low
Phalaris arundinacea	Reed canarygrass	Grass-like	High
Rosa eglanteria	Sweetbrier rose	Shrub	Medium-high
Solanum dulcamara	Bitter nightshade	Shrub	Medium

A potential invasive alien species, purple loosestrife (*Lythrum salicaria*), is known from a nearby site but has not been observed in the Jackson-Frazier Wetland. Visitors should be aware of this attractive tall purple forb and report any suspicious occurrence to the Benton Country Natural Areas & Parks Department.

Reed Canarygrass

This robust grass was once widely planted as a pasture grass and for stream bank stabilization in the early 20th century; however, there is no record of it being planted in the Jackson-Frazier Wetland. In 1978, field and air photo surveys show a few patches, each less than 20 m^2, scattered in open and shrubby areas, as well as a small monotypic area in the ephemeral pond. The pond, at that time, was dominated by cattail, mint, spike rush, and open water (Boss 1983). By 2004, about two to four acres are dominated by this invasive grass. The largest patch is in the ephemeral pond bordered by the boardwalk where the grass covers about 1.5 acres, its invasion furthered by a localized wildfire in 1987. Trevor Sleeman, a Philomath High School student, inventoried the larger patches of reed canarygrass in 2001 employing a field survey, GPS measurements, and air photo analysis.

Apfelbaum and Sams (1987) comprehensively reviewed the ecology and control of reed canarygrass, and more recently, Mandy Tu (2004), working with The Nature Conservancy, developed protocols for dealing with this aggressive species. The following is drawn from their work.

Establishing rapidly from a very large persistent seed bank, the grass grows vigorously early in the season from strong perennial rhizomes. It easily out competes other herbaceous species, ultimately forming very dense monocultures with a thick mat of litter. Seed germination is high. Most biomass is produced vegetatively from rhizomes. Because of the large seed bank and thick litter and rhizomatous mat, mechanical removal is often ineffective. Without additional control, mowing often increases production. Burning has been used to suppress reed canarygrass but will not eliminate it. Chemical (herbicide) control has been attempted. Herbicides, however, suppress native species too. Glyphosate (Rodeo) has been used successfully and when "…applied at five week intervals, Glyphosate had inconsequential effects on co-occurring species..." (Apfelbaum and Sams 1987). Biological control has not been developed.

The most comprehensive reed canarygrass control project being undertaken now in the Willamette Valley is by Mandy Tu (2004) in cooperation with the U.S. Army Corps of Engineers and The Nature Conservancy at Fern Ridge Reservoir (see http://tncweeds.ucdavis.edu/moredocs/phaaru 01.pdf). Tu tested response of the grass to combinations of mowing, tilling, shading, burning, flooding, and herbicide application. Preliminary treatment emphasizes removal of thatch, application of several control treatments, repeated applications, and concurrent seeding with natives. Best Management Practices suggested in 2004 are as follows:

Scattered Individuals

1. Dig out with trowel
2. Spot spray or wick herbicide
3. Spot flame with propane for seedlings

Distinct Patches

1. Dig out
2. Cover with shade cloth (preceded by mowing)
3. Mow (to eliminate seeds), spot spray, or wick herbicide

Large Patches (up to several acres) with Scattered Natives (method depends on desired level of native vegetation retained)

1. Mow then cover with shade cloth
2. Mow then wick, spot spray, or boom spray
3. Herbicide using appropriate application technique
4. Spot burn then spot burn regrowth
5. Cover with shade cloth (may be preceded by a mow treatment)

In 2004, Benton County staff, after consultation with the Technical Advisory Committee, mowed several large monotypic patches of reed canarygrass under contract. In the fall of 2004, these areas were treated for the first time by spraying or spot spraying herbicide.

False Brome

First reported in Oregon in 1935, *Brachypodium sylvaticum* is an extremely aggressive, prolifically seeding perennial grass invader of forest understory, open areas, and wetlands (personal communication Tom Kaye) in western Oregon. The most thorough documentation of this invader has been prepared by Mandy Tu of The Nature Conservancy Wildland Invasive Species Team. 2002. Much of the following discussion is drawn from Tu (2002).

The center of spread for false brome is in Benton County, especially in the vicinity of McDonald Forest, the watershed of Jackson-Frazier Wetland. The grass was first reported in Jackson-Frazier Wetland in 1994 by Richard Halse in the small area of *upland* at the northwest edge of Jackson-Frazier Wetland. In his T&E species survey, Tom Kaye confirmed this sighting in 2003. He also identified a small patch in the north central portion of Jackson-Frazier Wetland established in a *wetland* area and noted that false brome has the potential to spread in wetlands.

Fortunately, from the perspective of controlling this invader, false brome is currently highly localized. However, *B. sylvaticum* can become dominant in the understory of forests and wetlands that it invades, forming nearly monospecific stands that appear to out compete and completely exclude native forbs and grasses. *B. sylvaticum* is listed on the Pacific Northwest Exotic Pest Plant Council list B, indicating that it is a wildland weed of lesser invasiveness (PNW-EPPC 1997). This classification, however, may underestimate the threat it poses to native vegetation from the perspective of Jackson-Frazier Wetland. Immediate control is a high priority.

According to Tu (2002), repeated mowing, grazing, or burning treatments that are carried out *before seed set* may benefit control efforts by eliminating seed production each year. These methods may also increase the efficacy of subsequent herbicide treatments by forcing the plants to produce new shoots that are more likely to take up and be killed by contact herbicides.

Herbicide applications are currently the most effective technique known for controlling *B. sylvaticum*. Attempts to control this species with hexazinone (trade name Velpar®) and a glyphosate formulation (trade name Accord®) were effective. According to Tom Kaye, application of Accord® at a rate of 2 quarts/acre (with surfactant Activar 90®), followed a year later by Velpar® at 1 gallon/acre, provided good control; however, proper formulation and application of glyphosate herbicides has not yet been codified.

Recommended Implementation Measures

With reference to Policy 1. *Protection* and Policy 2. *Restoration*

Implementation Measure 13

Implement the recommended protocols for control of reed canarygrass in the Public Use Management Unit, Wetland Prairie Management Unit, and selectively in the Mixed Wetland Forest-Shrub Management Unit. Implement recommended protocol for control of false brome in the Upland Management Unit.

APPENDIX 7
Hydrology

Background

Jackson-Frazier Wetland hydrology relates to: (1) climate, (2) watershed surface and ground water inputs, and (3) hydrological disturbance within the wetland. In general, hydrology depends on the interaction of precipitation with watershed topography, geology, and land use. Many external factors are beyond the purview of this management plan; however, because wetlands are absolutely dependent on water input and its quality, hydrological recommendations in the plan will necessarily touch on watershed land use.

Jackson and Frazier Creeks join at the Highway 99W bridge and provide the major surface water input to the wetland. A few very small seasonal channels enter from the west. Stewart Slough (Village Green Ditch), Frazier Creek Ditch, and two ditches exiting the eastern edge of the wetland are the principal outflows (Map 2). Internal surface drainage was mapped and approximate flows graphed by Scientific Resources, Inc. (1986). Knowledge about groundwater is from d'Amore, et al. (2000); however, neither Jackson nor Frazier Creeks are gauged. The original Corvallis Drainage Master Plan, based on modeling, considered Jackson and Frazier Creek basins and recommended waterway preservation and maintenance of natural drainage using nonstructural management with setbacks (CH2M-Hill 1981). The plan provided simulated hydrographs for Jackson and Frazier Creeks with inputs into Jackson-Frazier Wetland of 1220 cfs at 100 year flows assuming projected year 2000 land use conditions; however, the expected level of development has not been reached (CH2M-Hill 1981). The 2003 Corvallis Drainage Master Plan does not analyze watershed flow regimes (City of Corvallis 2003) nor does the North Corvallis Area Plan (City of Corvallis 2002).

Most of the Jackson-Frazier Wetland is within the 100-year Willamette River floodplain and major floodwaters have been reported to backup Stewart Slough (CH2M-Hill 1981). The central and southern portions of the wetland at 217 feet MSL or below are subject to shallow flooding at depths of 1-2 feet under a 100-year flood. Normally, much of the wetland is flooded by several inches of water from mid-December through mid-May

Hydrological study within the wetland has been fragmentary. Drost (1985) measured hydrological flow into the wetland from November 1983 to February 1984 at Jackson-Frazier Creek and outflow at Stewart Slough. With limited sampling, she found no clear relationship between rainfall and wetland runoff.

In 1979-80, the Environmental Protection Agency measured water tables and soil moisture in the vicinity of the ephemeral pond near the present boardwalk. Surface soil was inundated from autumn rains through late spring. Away from the pond, in a rose-dominated wetland plant community, flooding terminated in late April but soil remained saturated until mid June (Boss 1983).

A major hydrological and stratigraphic study was undertaken by d'Amore, et al. (2000) and corroborated earlier hydrologic observations. The wetland is integrally linked to its watershed for surface stream water *and* for groundwater. Together, they provide the essential hydrological inputs to the wetland. Jackson-Frazier Wetland is underlain by a 3-7 foot shrink-swell clay layer that overlays another thinner clay layer and a thick layer of coarser silt that was laid down when glacial lakes briefly flooded the Willamette Valley. In fall, the porous cracked surface clay layer takes in rain and slowly becomes a thick impermeable clay layer that "perches" winter rains above the deeper more permeable silts. Groundwater becomes the major water input into the deep soils, independent of the surface water, and keeps the wetland moist into late spring.

Hydrological Alterations in Jackson-Frazier Wetland

Prior to the excavation of Stewart Slough in the early 1930s, apparently Jackson-Frazier Wetland drained mostly to the northeast into Frazier Creek Ditch. Aerial photographs from 1936 show a few shallow drainage ditches and the newly excavated Stewart Slough Ditch, but no historical study of the wetland has been conducted. In an attempt to damage the site in November 1985, the landowner altered 13.2 acres in the southern portion of the wetland by scraping woody vegetation, *compacting* soils in parallel 2-foot-wide tractor tracks about 4 feet apart, damaging soft vegetation, excavating new ditches, and reexcavating older ditches elsewhere in the wetland. The alteration was the subject of a report prepared by Scientific Resources, Inc. (1986), which concluded that "[t]he ultimate effect of recent alterations will be to facilitate a rapid transition from wetland to upland vegetation as soils are dewatered from ditching and draining." In the summer of 1987, the Division of State Lands attempted to place a number of shallow dirt check "dams" in the main excavated channels (personal communication with Ken Bierly). Flow quickly reestablished around these diversions. The "rapid transition" projected by SRI has not occurred, but site hydrology has probably changed because of this damage 20 years ago.

Restoration of Damages

Hydrological management of the damage could be achieved by: (1) placement of weirs at Stewart Slough and Frazier Ditch in order to increase overall ponding within the wetland; (2) filling shallow interior ditches with less erodable material; (3) creating small check dams or weirs within the wetland. Without further knowledge of the desired hydrological status, initiating one of these actions or others would not be prudent. An experimental approach might be appropriate in which case a weir or two could be built, and effects of ponding on wetland vegetation assessed. However, in the absence of adequate hydrological data, it is essential for the long-term management of the wetland that a careful and consistent hydrological monitoring project be initiated with the aim of relating wetland vegetation to hydrology.

Water Quality

Referring to nutrients, temperature, pollutants, and sediments, water quality has a reciprocal relationship to wetlands – wetlands may be harmed by poor water quality and wetlands may improve downstream water quality. Little is known of the water quality in Jackson-Frazier Wetland. Certainly, future urbanization in the wetland watershed will alter the flow regime of streams creating more flashy winter flows and diminishing summer flows. Water quality

also will be altered – summer water temperatures will be higher, and nutrients such as nitrogen compounds and phosphates will increase as will heavy metal and organic pollutants.

In a preliminary study, students at Crescent Valley High School, under the supervision of Bob Madar (Prows and Donaldson 1999), examined nitrate, ammonium, and oxygen in water samples in the creek water input upstream of Jackson-Frazier Wetland and compared this with water samples taken within the wetland. The students found:

1. watershed water quality dissolved oxygen was within EPA healthy watershed standards
2. nitrates in watershed input were slightly elevated, but ammonium concentration was lower
3. nitrates, ammonium ions, and dissolved oxygen were all lower in samples taken within the wetland than in the samples taken upstream
4. nitrogen and ammonium ion concentrations were elevated with fall rain inputs

Hydrological Issues in the Watershed
Both watershed surface water and groundwater are critical to the future survival of Jackson-Frazier Wetland. This concern relates to water quality, quantity, and seasonal flow pattern. Recognized in the 1991 ESSE, and in the 1992 Jackson-Frazier Wetland Management Plan, this issue remains paramount to the present refinement. The North Corvallis Area Plan (1999), the City of Corvallis Stormwater Master Plan (2003), and the Owens Farm Open Space Plan (2004) all make note of this concern. Fears that surround this issue are inadequacy of riparian management protocol with regard to setbacks, inadequate riparian corridor width, stormwater utilities, roads and road location, utility right-of-ways, extent of impervious surfaces, and density and intensity of urbanization. The Jackson-Frazier Wetland Technical Advisory Committee, with recommendation to the Benton Country Natural Area & Parks Director, has addressed all these concerns at every opportunity to date. *Often, the steps taken by the City of Corvallis have not been sufficient to adequately protect the wetland*.

Recommended Implementation Measures

With reference to Policies 1. *Protection*, 5. *Education*, 7. *Connectivity*, and 8. *Off-site Partnering*

Implementation Measure 14

At every public opportunity, express concern for managing the Jackson-Frazier Wetland watershed to maintain or improve the current hydrological regime and water quality, suggest alternatives to damaging proposals, and publicize the concerns of Benton County toward maintaining a healthy wetland.

APPENDIX 8
Public Use Management

Background
The primary LCDC charge to Benton County is to protect Jackson-Frazier Wetland. In responding to this responsibility, the Benton County Board of Commissioners established the wetland as a park unit, thereby allowing public uses that would not damage the wetland. Among these uses have been: (1) general passive recreation, (2) education, and (3) research.

Access
As a Benton County natural area and park, access to Jackson-Frazier Wetland is free. Getting to the wetland from Corvallis and surroundings is relatively straight forward (Map 1 and Map 3).

- The only public access is from the City of Corvallis street system that starts immediately south of the wetland. Car access is from NE Lancaster Street cu-de-sac where a short paved path leads to the wetland and from NE Canterbury Circle where a paved path also leads west to the wetland.
- On-site parking is available for about six cars or one small bus at the cul-de-sac and for a number of vehicles along nearby streets; no adequate large bus turn-around is available. Handicap parking and wheelchair curb access is located at the cul-de-sac for two vehicles. There is a constraint on expanding parking without full cooperation of the neighborhood and the City of Corvallis. This also would involve a major expense.
- Access to the wetland using public transportation is by Corvallis Transit System Route 7, which has two bus stops along Conifer Blvd. (no service on holidays and Sundays). From the bus stops, accessing the wetland requires a 1/3 mile walk north along Lancaster Street sidewalk.
- Bikeway access from Conifer Blvd. is via Highway 99W, 9th Street, or Conser Street, but not all streets have marked on-street bicycle lanes.
- Pedestrian access is by sidewalk along the street system.
- Within the wetland, a four-foot wide boardwalk loop allows the public, including disabled visitors, easy access; total distance is more than 2/3 of a mile.

Public Uses
Major public uses of Jackson-Frazier Wetland include recreation, education, and research, covered under general Policies 5, 6, and 7.

Recreation
Appropriate passive recreation includes a variety of enjoyable activities that neither damage the wetland nor interfere with other persons. *Passive* recreation includes, but is not limited to, casual walking, walking for exercise, relaxation, photography, dog

walking, strolling, casual nature study such as, bird watching, plant identification, and other observational activities, contemplation, informal learning, etc. Recreational activity is *confined to the boardwalk*. Informational displays along the boardwalk have been developed to enhance the visitor's appreciation of the wetland. Five benches have been installed. The boardwalk meets ADA requirements and disabled citizens are welcome to use the wetland.

Inappropriate recreational activities include field sports, races, picnicking with formal facilities (such as picnic tables, garbage disposal units, and grills), boom boxes, bicycling, skateboards, scooters, roller blades, pogo sticks, motorized locomotion of all types (except for disabled persons and maintenance), horseback riding, and fireworks of all types (fire danger). Hunting, trapping, firearm and bow and arrow use, traditional recreational activities, are prohibited as matter of park policy.

Some public uses require constant monitoring and regulation:

1. Dogs are allowed on the boardwalk on a short lead and owners are asked to provide sanitation. A "doggie bags" station is available at the entry kiosk.
2. Leaders of large public outings are asked to fill out a special use permit available at the Benton County Natural Areas & Parks Department
3. Off-boardwalk recreational use is discouraged, and such use requires a special use permit available at the Benton County Natural Areas & Parks Department
4. Collection of plant or other biotic specimens is prohibited without a special use permit available at the Benton County Natural Areas & Parks Department

Educational Use

The proximity of Jackson-Frazier Wetland to Cheldelin Middle School and Crescent Valley High School makes it an ideal "outdoor classroom" facility. Life science and earth science classes have been using the site since the early development phases of the natural area. Because of heavy traffic by middle school classes, the necessity of building the boardwalk became an immediate issue. Today, both "look see" and research-oriented activities are conducted. Students are kept apprised of management and restoration efforts, and where feasible, contribute through data collection and other activities. A handicapped student from Cheldelin was engaged in determining the appropriateness of the width of a sample section of the boardwalk, and his recommendations for boardwalk design were heeded as final boardwalk plans were implemented. Other local education groups such as 4-H, the Environmental Center, and other public school groups have visited Jackson-Frazier Wetland to learn about wetland functions and resources and, from time to time, they have used the facility for educational purposes..

Management of educational use will continue to follow a number of guidelines. Jackson-Frazier Wetland provides a rich resource for informal and formal education. A number of activities under appropriate recreational use are also important informal public educational uses, i.e., nature study and birding, Formal educational uses

include: (1) supervised field trips; (2) supervised class projects, both supportive of the school curriculum at various educational levels from grade school through college; (3) “walk through” and “look see” field trips often at the elementary level; (4) professional training or demonstration, such as wetland identification courses for resource professionals; and (5) educational and management oriented activities and assistance involving students in the Benton County Natural Areas & Parks restoration programs or monitoring.

Except for “walk through” and “look see” field trips along the boardwalk, for which special use permits are not needed, other trip leaders or teachers must apply for a special use permit. This will help avoid conflict between users, assure protection of wetland resources, and help collection of data for management of the wetland. Supervisors of formal educational projects can obtain this permit at the Benton County Natural Areas & Parks Department. Limited resources to assist teachers are also available, such as plant and bird lists and brochures. A special brochure suggesting educational field activities will be prepared in the future.

Research

Jackson-Frazier Wetland has been a frequent site for research since the 1980s, and many research projects have focused on the wetland or used the wetland together with other sites. Supervised research projects conducted by high school students are encouraged. At least eleven theses or dissertations have used the wetland as a research site. Several peer-review studies have been published and university and federal agency researchers have established Jackson-Frazier as a research site. The Department of State Lands has validated wetland assessment methods at Jackson-Frazier and the U.S. Fish and Wildlife Service has tested their mitigation protocol and monitoring system using the wetland. Benton County Natural Areas & Parks Department attempts to keep track of the various projects and maintains a file of all reports, publications, or theses. The scope of research activity at the wetland is tabulated in Appendix 11

Research work that assists Benton County Natural Areas & Parks staff to manage and restore the wetland are especially important, and priority is given to such projects. Managing research involves a number of concerns that are tabulated below:

- Research supervisors must obtain a special use permit identifying the project, its purpose, specific location, duration, equipment, etc. from the Benton County Natural Areas & Parks Department. This information will help avoid conflict with other users and assure protection of research equipment, plots, etc.
- People wishing to conduct research should first contact and Technical Management Advisory Committee. The committee maintains records of research projects (type, location, timing, contact person, etc.) and can ensure that research activities do not conflict. The committee also monitors individual and cumulative wetland impacts resulting from research activities, and can provide useful information.
- Manipulative research that might impair the resources is generally not allowed

- Nature and extent of specimen collection must be described on the permit

Recommended Implementation Measures

With reference to Policy 1. *Protection*, Policy 5. *Recreation*, Policy 6. *Education*, and Policy 7. *Research*

Implementation Measure 15 (Recreation)

Recreational activity at Jackson–Frazier Wetland shall be carried out in such a manner that wetland resources are not damaged or altered. The following guidelines will ensure resource protection:

- limited passive recreation is confined to the boardwalk for casual walking, light exercise, walking dogs on leash, photography, nature study, bird watching, etc.
- place displays along the boardwalk as educational aids
- inappropriate recreational activities include, but are not limited to, field sports, races, formal picnicking, bicycling, skate boards, scooters, roller blades, motorized locomotion (except for disabled persons), hunting, trapping, and firearm use
- selected recreational activities will be monitored, including dog use, boardwalk condition, and other facility damage, etc.
- off-boardwalk use is discouraged and will only be allowed with a special use permit available at the Benton County Natural Areas & Parks Department.

Implementation Measure 16 (Education)

Educational use of Jackson-Frazier Wetland is encouraged and management will focus on formal education, including:

- off-boardwalk supervised field trips and class projects, professional training, educational and management activities require a special use permit available at the Benton County Natural Areas & Parks Department
- “walk through” field trips using the boardwalk do not require a permit
- displays along the boardwalk will be part of the educational program for the wetland
- encouraged discussion of educational needs with the Jackson-Frazier Wetland Technical Advisory Committee

Implementation Measure 17 (Research)

Research use is encouraged at Jackson-Frazier Wetland and should conform to the following guidelines:

- research that will help in the management and restoration of the wetland is encouraged and will be given priority
- special use permits are required to prevent conflict among researchers, minimize damage to the wetland, and assure collection of data useful for management
- helpful information for researchers is available from the Benton County Natural Areas & Parks staff and the Technical Management Advisory Committee, and both should be contacted
- manipulative research that might impair the resources is not allowed
- special use permits are required for collection of plants and animals

APPENDIX 9
Connectivity

Background
"Connectivity" refers to the linkages between the wetland and surrounding landscape that involve movement of people and animals as well as features such as trails that connect landscape units. For planning purposes, we distinguish between two types of connectivity: (1) connections related to human activities, and (2) interconnections among natural elements such as hydrological connectivity and movement of biota along corridors. These two different types of connectivity, of course, are impossible to separate. For example, a riparian corridor relates strongly to water movement and animal migration, but it also relates to opportunities for trail connections and open space networks.

Connections Related To Human Activities
Increased connectivity between the wetland and its surrounding lands is stressed in the Vision Statement. Linkage, external to the wetland boundaries is possible through a combination of protected riparian corridors along Jackson and Frazier Creeks and a network of public trails and bikeways between Jackson-Frazier Wetland and surrounding lands (Map 2 and Map 5). For example, a trail linking Jackson-Frazier Wetland with Chip Ross Park and McDonald State Forest would help fulfill the visions of both the City of Corvallis and Benton County Natural Areas & Parks. Such a trail would also enhance intervening residential property values. Other connectivity opportunities include linking the wetland to the Corvallis multimodal bikeway system along Highway 99W and partnering with the W&P Railroad to create a Rails-*with*-Trails (RWT) route paralleling Highway 99W or with the proposed Corvallis-Albany RWT route.

Trail Linkage to the Jackson and Frazier Creek Watersheds
Recent public acquisition of Owens Farm Natural Area and the associated purchase by Greenbelt Land Trust of land west of Jackson-Frazier Wetland together with the adoption by the City and County of the North Corvallis Area Plan (NCAP) in 2001 provide the opportunity to plan a trail/bike/equestrian connection between Jackson-Frazier Wetland, Chip Ross Park, and McDonald Forest (Map 5). The NCAP, with a 50 to 80-year planning horizon, presents a conceptual plan for this connection, as does the Benton County Parks System Trails Plan (2003). On the positive side, there has been much public discussion of this opportunity.

Land Between Jackson-Frazier Wetland and W&P Railroad
Acquisition and management of Owens Farm properties *east* of the W&P Railroad by Greenbelt Land Trust and City of Corvallis, will greatly enhance the possibilities of trail connection across the railroad and highway and protect the wetland. Benton County Natural Areas & Parks Department has informally proposed this transfer to both parties.

Constraints to a Regional Trail Connection
Serious constraints block the visualized trail/bike/equestrian connection, primarily the presence of the W&P Railroad and Highway 99W. Currently, the only feasible at-grade crossings for the W&P Railroad are at Conifer Blvd., Elliott Circle, and Granger Road. The only safe highway crossing is at the Conifer Blvd. and Granger/Lewisburg Road. A safe highway crossing at Elliott Circle would require installing a stop light on Highway 99W. A track *and* highway crossing would have to be coordinated with the W&P Railroad Company, the Oregon Department of Transportation, the City of Corvallis, and Benton County. If such a crossing were planned at Elliott Circle, it would require pedestrian bridges spanning Jackson and Frazier Creeks on both sides of the W&P Railroad/Highway 99W route, as well as short lengths of boardwalk. Use of existing railroad and highway crossings is possible, but feasibility would depend on the City of Corvallis, Benton County, and several private landowners working out acceptable routes on both sides of the W&P Railroad and Highway 99W. A second constraint relates to locating a trail *within* the Jackson-Frazier Wetland that would require a lengthy elevated walkway or elevated segments.

The third constraint to a trail/bike/equestrian linkage is crossing a number of private ownerships west of Owens Farm. Recent joint efforts involving County, City, and private groups produced the Benton County Trail Plan (2003). Public and private parties are talking and view positively a regional network of trails. This is an excellent sign in overcoming these constraints.

Other Trail Connections
The existing pedestrian link between Jackson-Frazier Wetland and Cheldelin Middle School is much used by teachers, students, and the general public. It is a safe walk of only a few minutes along a paved walkway from the school to the wetland. An extended linkage with the proposed Rails-with-trails Albany to Corvallis segment is very feasible. A similar linkage to Crescent Valley High School awaits solving the crossing of the railway and highway.

Currently, no specific pedestrian or bicycle connection exists between the City of Corvallis core and the wetland, other than the existing system of multi-modal bikeways, roads, and sidewalks. However, a formal northward extension of the recently completed bikeway paralleling Highway 99W to Circle Blvd. is desirable, but no plans have been initiated for this connection.

Connection Related to Railroads
Jackson-Frazier Wetland lies between two operating rail lines. The Benton County Board of Commissioners and the Benton County Natural Areas & Parks Department have been meeting with other interested parties about establishing to the east a Rails-*with*-trails program along low-traffic tracks in the Benton County area (Bastain and Hoppe 2003). Also, with the abandonment of any local rail lines, the County could take advantage of the situation and help establish a Rails-*to*-Trails program. In this regard, the wetland is situated

between two relatively low traffic railroad lines that could in the future accommodate City or County trail partnerships.

Wildlife Corridors and Connections
A tenet of natural area management is to maintain protected corridors between natural area units to facilitate movement of biota. These all-important linkages help break down landscape fragmentation that so often leads to diminished local and regional biodiversity and extinctions. Attention to corridor protection is especially important in urbanizing landscapes like that surrounding Jackson-Frazier Wetland. The obvious local intact corridors are the riparian zones along inflowing and out flowing stream and ditch systems.

Recommended Implementation Measures

With reference to Policies 1. *Protection*, 8. *Connectivity*, and 9. *Off-site Partnering*

Implementation Measure 18

Benton County Natural Areas & Parks Department should be alert to removal-fill applications and developments that might hydrologically compromise stream flow, the riparian corridor, and groundwater infiltration in the Jackson-Frazier Wetland watershed, and should comment accordingly to the City, County, or state authorities with respect to wetland protection and connectivity concerns.

Implementation Measure 19

Explore options for acquiring and managing public lands adjacent to and west of the wetland.

Relates to Policies 1. *Protection* and 9. *Off-site Partnering*

Implementation Measure 20

Benton County Natural Areas & Parks Department shall work with the Corvallis Community Development Department and Corvallis Parks and Recreation Department in securing protection of the hydrological features in the wetland watershed.

Relates to Policies 1. *Protection*, 8. *Connectivity*, and 9. *Off-site Partnering*

Implementation Measure 21

Benton County Natural Areas & Parks Department shall actively promote and participate with City, County, state, and private organization efforts to develop a trail/bikeway connection between the wetland and parks and open spaces in and beyond, the wetland watershed, with priority given to crossing the W&P Railroad and Highway 99W.

Relates to Policies 5. *Recreation*, 8. *Connectivity*, and 9. *Off-site Partnering*

Implementation Measure 22

Benton County Natural Areas & Parks Department shall take initiative in rezoning newly acquired Jackson-Frazier Wetland areas in accordance with their wetland and protection status, and encourage the City and Greenbelt Land Trust to do likewise.

Relates to Policies 1. *Protection*, 3. *Management*, and *Off-site Partnering*

Implementation Measure 23

Benton County Natural Areas & Parks Department shall work with the City of Corvallis and Greenbelt Land Trust in developing a trail or bikeway route from the Lancaster cul-de-sac parking area to land east of Highway 99W minimizing damage to the wetland resources yet providing potential connection across the railroad and highway.

Relates to Policies 5. *Recreation*, 8. *Connectivity*, and 9. *Off-site Partnering*

Implementation Measure 24

Benton County Natural Areas & Parks Department should be alert to participating in any adjacent rails-*with*-trails or rails-*to*-trails efforts.

Relates to Policies 5. *Recreation*, 8. *Connectivity*, and 9. *Off-site Partnering*

APPENDIX 10
Vegetation Debris Removal Procedures

Overview
These operating procedures for vegetation control have been developed by Benton County Natural Areas & Parks staff and approved by the Jackson-Frazier Wetland Technical Advisory Committee in April 2001. The purpose of the procedures is to provide standard guidelines for anyone performing vegetation control. The goal is to achieve consistent results and to provide a safe, aesthetically pleasing, natural looking environment and to do so in an efficient, economical manner.

Grass and Brush Control

When:
Approximately 3-4 times per year. Once after spring flush (mid May); after late spring growth (late June-early July); after early fall growth (late Sept.-early Oct); possibly late fall (end of Nov.). Typically when grass averages 12 inches tall or when brush and grass are growing within the plane of traffic along sidewalk and boardwalk.

Where:
Wooden fence: 1 foot each side
Large bridge: 2 feet each side
Boardwalk: 3 feet each side
Cul-de-sac: grass strip between curb and fence
Sidewalk: from cul-de-sac to bridge, 18” from edge

Cut Standards:
Grass, 2 inches high
Brush, round off the upper edge of brush so it tends to feather into taller background vegetation and not look flat sided.

Removal:
Cut all brush and grass in small increments so it lies close to the ground. It can remain in place, but blow off any vegetation on hard surfaces.

Tree and Limb Control

When:
Perform as needed, with weekly and bi-weekly inspection. Staff should carry a pruning saw to resolve problems identified below.

Where:
Special removals as directed by Benton County Natural Areas & Parks staff or other authorized agent. As a maintenance item, where branch or tree breaks the edge plane of sidewalk or boardwalk and where any material overhangs these surfaces and is

within 8 inches of surface. Wherever there are poor quality cuts or broken limbs. Foliage archways of vegetation over the boardwalk are encouraged where practical.

Cut Standards:
Trees: cut flush with typical grade
Limbs: cut back to a strong lateral that is at least half the diameter or greater of the branch being removed. Cuts are to be clean and flush to the branch collar. *No stubs, please*! If cuts cannot be made back to a strong lateral, make cut flush with typical grade.

Removal (or the art of disposal so the site retains a natural look):
Recycle the vegetation on site to the greatest extent possible.

Trails
Unauthorized trails can be discouraged by putting cut limbs on them to curtail use. Do not do this for open trails in low vegetation. People will just walk around. Only use where trails go through brush or trees. Plug openings with vegetation that looks similar and blends well with existing vegetation. Have cut ends facing away from the primary view. Discourage only human trails that are having a significant negative impact to the site. Game trails should be left. It is advised to consult with a Benton County Natural Areas & Parks representative if in doubt about which trails need to be discouraged.

Blend cut vegetation with existing vegetation so it cannot be seen from boardwalk or sidewalk. If vegetation is small and far enough from vision, it can be cut up into small pieces and left where it is; if left in contact with the ground it will soon decompose. If vegetation is larger, drag to a brushy area well away from view, cut up into small pieces, and insert into brush so it lies close to the ground. Perform this method of disposal over a broad area so it does not look obvious. Insert cut end into brush first.

In the past, cut vegetation was thrown on top of other vegetation; however, this method should no longer be used because the cut ends were often in full view, or it was not thrown far enough to remove it from view. In addition, it often remained on the existing vegetation for years, unable to decompose quickly, and looking artificially placed.
As a general rule, dispose of material on site in such a way that looks as natural as possible.

APPENDIX 11
Research Projects at Jackson-Frazier Wetland

The compilation below includes major publications, theses, and reports that are either focused exclusively on Jackson-Frazier Wetland or have substantial research completed at the wetland.

Adamus, P.R. 1999. Association of winter avian communities with landscape and local characteristics of riparian and wetland habitats of the Willamette Valley, Oregon. Ph.D. dissertation, Department of Fisheries and Wildlife, Oregon State Univ., Corvallis.

Boss, T.R. 1983. Vegetation ecology and net primary productivity of selected freshwater wetlands in Oregon. Ph.D. dissertation, Oregon State Univ., Corvallis. (part of the EPA's research effort in developing methods for delineating wetlands 1979-82).

D'Amore, D.V. 1995. The stratigraphy, hydrology, redoximorphic character of the Jackson-Frazier Wetland. M.S. thesis, Oregon State Univ., Corvallis.

D'Amore, D.V., et al. 2000. Stratigraphy and hydrology of the Jackson-Frazier Wetland, Oregon. Soil Sci. Soc. Am. J. 64: 1535-1543.

D'Amore, D.V., et al. 2004. Saturation, reduction, and the formation of iron-manganese concretions on Jackson-Frazier Wetland, Oregon Soil Sci. Soc. Am. J. 68:1012 - 1022.

Drost, M. B. 1985. Preliminary investigation into the hydrology of Jackson-Frazier Wetland. M.S. research paper, Department of Geography. Oregon State Univ., Corvallis.

Griffith, J.A. 1989. A land use planning application of the Wetland Evaluation Technique (WET) to Jackson-Frazier Wetland, Benton County, Oregon. M.S. research paper, Department Geography, Oregon State Univ., Corvallis.

Halse, R.R. and K.L. Chambers. 1978. Vascular plants of Jackson-Frazier Wetland: An annotated list. Department Botany and Plant Pathology, Oregon State Univ., Corvallis.

Halse, R.R 1998. Jackson-Frazier Wetland Vascular Plants – Alphabetical. Unpublished report, Department Botany and Plant Pathology, Oregon State Univ., Corvallis (working list under development).

Huddleston, J.H. 1993-present. Assessment of hydric soils, a program related to the National Technical Committee for Hydric Soils, U.S.D.A, Natural Resource Conservation Service. Jackson-Frazier is one of the study sites for this committee. Department Soils, Oregon State Univ., Corvallis.

Jones, L.D. 1998. A resource classification and vegetation change analysis of the Jackson-Frazier Wetland, Benton County Oregon. M.S. research paper, Department of Geosciences. Oregon State Univ., Corvallis.

Kaye, T.N. and M. Kirkland. 1994. Status of Bradshaw's Lomatium at the Jackson-Frazier Wetland. Unpublished report funded by the U.S. Fish and Wildlife Service and Oregon Department of Agriculture, Plant Conservation Program, Salem, Oregon. On file at the Benton County Natural Areas & Parks Department.

Kaye, T.N. 2003. Rare plant survey of Jackson-Frazier Wetland. Unpublished report Institute for Applied Ecology, Corvallis, Oregon.

Lattin, J.D. and M.D. Schwartz, 1986. A review of *Acetropis americana* Knight in North America (Hemiptera: Miridae: Stenomedini). J. New York Entomol. Soc.94: 32-38.

Marshall, J.L. 1985. Value assessment of Jackson-Frazier Wetland, Benton County Oregon: A Case Study. M.S. thesis, Oregon State Univ., Corvallis.

Morell, J.J. and R. Rhatigan. 2000. Preservative movement from Douglas-fir decking and timbers treated with ammoniacal copper zinc arsenate using best management practices. Forest Products J.50: 54-58.

Roth, E.M. 1993. A test of the Oregon freshwater wetland assessment methodology. Oregon Division of State Lands, Salem.

Slane, L.B. 2001. Small mammal assemblages in natural and restored wet prairies: an evaluation of habitat in Oregon's Willamette Valley. Unpublished M.S. paper on file in the Geosciences Department, Oregon State Univ., Corvallis.

Staley, A. 2003. Thirteen ways of looking at a wetland. Oregon Parks and Recreation. Article published for the ORPA, Ashland, Oregon.

Stewart, S. 1997. Origin and age of Fe-Mn-P concretions and nodules in an Oregon wetland. Ph.D dissertation, Oregon State Univ., Corvallis.

APPENDIX 12
Plant List

PROVISIONAL JACKSON-FRAZIER WETLAND VASCULAR PLANT LIST

I/N	BOTANICAL NAME	AUTHOR	FAMILY	COMMON NAME
	Acer macrophyllum	Pursh	ACERACEAE	bigleaf maple
	Achillea millefolium		ASTERACEAE	yarrow
	Agoseris grandiflora		ASTERACEAE	bigflower agoseris
	Agrostis exarata		POACEAE	spike bentgrass
*	Agrostis tenuis	Sibth.	POACEAE	colonial bentgrass
*	Aira caryophyllea		POACEAE	silver hairgrass
*	Aira elegans		POACEAE	elegant hairgrass
	Alisma plantago-aquatica		ALISMATACEAE	American waterplantain
	Allium amplectens		LILACEAE	slimleaf onion
	Alopecurus geniculatus		POACEAE	water foxtail
	Alopecurus pratensis		POACEAE	meadow foxtail
	Amaranthus powellii	Wats.	AMARANTHACEAE	
	Amelanchier alnifolia		ROSACEAE	saskatoon serviceberry
*	Anthemis cotula		ASTERACEAE	dog fennel
*	Anthriscus scandicina		UMBELLIFEREAE	chervil
	Aquilegia formosa	Fisch.	RANUNCULACEAE	columbine
*	Arrhenatherum elatius		POACEAE	oatgrass
	Asclepias fascicularis		ASCLEPIACEAE	Mexican milkweed
	Aster chilensis var. hallii		ASTERACEAE	Pacific aster
	Aster subspicatus		ASTERACEAE	Douglas aster
*	Avena sativa	L.	POACEAE	common oats
	Barbarea orthoceras		BRASSICACEAE	wintercress
	Beckmannia syzigachne		POACEAE	sloughgrass
	Berberis aquifolium		BERBERIDACEAE	Oregon grape
	Bidens cernua		ASTERACEAE	nodding beggars-ticks
	Bidens frondosa		ASTERACEAE	beggars-ticks
	Boisduvalia densiflora		ONAGRACEAE	dense spikeprimrose
*	Brachypodium sylvaticum	(Huds.) Beauv.	POACEAE	
*	Briza minor	L.	POACEAE	little quaking grass
	Brodiaea congesta		LILACEAE	bluedicks brodIaea
	Brodiaea elegans	Hoover	LILACEAE	bluedicks brodiaea
	Brodiaea hyacinthina		LILACEAE	hyacinth brodiaea
	Bromus carinatus		POACEAE	California brome
*	Bromus japonicus		POACEAE	Japanese brome
*	Bromus rigidus		POACEAE	ripgut brome
*	Bromus secalinus		POACEAE	chess brome
*	Bromus sterilis	L.	POACEAE	
	Bromus vulgaris	(Hook.) Shear	POACEAE	
	Callitriche palustris		CALLITRICHACEAE	water starwort
	Callitriche stagnalis	Scop.	CALLITRICHACEAE	pond starwort

	Camassia quamash		LILACEAE	camas
	Cardamine oligosperma		BRASSICACEAE	bittercress
	Cardamine penduliflora	Schulz	BRASSICACEAE	Willamette Valley bittercress
	Carex densa		CYPERACEAE	dense sedge
	Carex deweyana	Schw.	CYPERACEAE	Dewey's sedge
	Carex lanuginosa		CYPERACEAE	wooly sedge
	Carex leporina		CYPERACEAE	sedge
	Carex obnupta		CYPERACEAE	slough sedge
	Carex stipata		CYPERACEAE	sawbeak sedge
	Carex tumulicola	Mack,	CYPERACEAE	foothills sedge
	Carex unilateralis		CYPERACEAE	sedge
*	Centaurium umbellatum		GENTIANACEAE	centaury
*	Cerastium viscosum		CARYOPHYLLACEAE	sticky cerastium
*	Chrysanthemum leucanthemum		ASTERACEAE	oxeye daisy
	Cicuta douglasii		UMBELLIFEREAE	western waterhemlock
	Circaea alpina	L.	ONAGRACEAE	enchanter's nightshade
*	Cirsium arvensis	L.	ASTERACEAE	Canada thistle
*	Cirsium vulgare		ASTERACEAE	bull thistle
	Clarkia amoena ssp. lindleyi		ONAGRACEAE	godetia
	Claytonia parviflora	Dougl. Ex Hook.	PORTULACACEAE	
	Claytonia sibirica	L.	PORTULACACEAE	
	Convolvulus nyctagineus	Greene	CONVOLVULACEAE	
	Cornus stolonifera		CORNACEAE	red-osier dogwood
	Corylus cornuta		BETULACEAE	California hazel
	Crataegus douglasii	Lindl.	ROSACEAE	black hawthorn
*	Crataegus monogyna		ROSACEAE	English hawthorn
	Crataegus oxyacantha		ROSACEAE	Douglas hawthorn
	Crepis capillaris	L. Wallr.	ASTERACEAE	
	Crepis setosa		ASTERACEAE	hairy hawksbeard
*	Cynosurus echinatus		POACEAE	dogtail grass
*	Cytisus scoparius	(L.) Link	FABACEAE	Scot's broom
	Dactylis glomerata		POACEAE	orchard grass
	Danthonia californica		POACEAE	California oatgrass
*	Daucus carota		UMBELLIFEREAE	Queen Anne's lace
	Delphinium menziesii		RANUNCULACEAE	Menzies larkspur
	Deschampsia cespitosa		POACEAE	tufted hairgrass
	Deschampsia elongata	(Hook.) Monro	POACEAE	
*	Dipsacus sylvestris		DIPSACACEAE	teasel
	Downingia yina		SCROPHULARIACEAE	downingia
	Eleocharis acicularis	(L.) R. &. S.	CYPERACEAE	needle spikerush
	Eleocharis palustris		CYPERACEAE	common spikerush
*	Elymus caput-medusae		POACEAE	Medusahead wildrye
	Elymus glaucus var. glaucus	Buckl. *	POACEAE	
	Epilobium paniculatum		ONAGRACEAE	autumn willowweed
	Epilobium watsonii		ONAGRACEAE	watson willowweed
	Eriophyllum lanatum		ASTERACEAE	wooly eriophyllum
	Eryngium petiolatum		UMBELLIFEREAE	coyote thistle
*	Festuca arundinacea		POACEAE	reed fescue
	Festuca microstachys		POACEAE	small fescue
	Fragaria virginiana		ROSACEAE	strawberry

	Fraxinus latifolia		OLEACEAE	Oregon ash
*	Galium aparine		RUBIACEAE	catchweed bedstraw
*	Galium cymosum		RUBIACEAE	bedstraw
	Galium trifidum	L.	RUBIACEAE	small bedstraw
	Galium triflorum	Michx.	RUBIACEAE	sweetscented bedstraw
*	Geranium carolinianum		GERIANIACEAE	Carolina geranium
*	Geranium dissectum		GERIANIACEAE	cutleaf geranium
	Geranium oreganum		GERIANIACEAE	Oregon geranium
	Geum macrophyllum		ROSACEAE	largeleaf avens
	Glyceria occidentalis		POACEAE	mannagrass
	Gnaphalium palustre		ASTERACEAE	mud cudweed
	Gratiola ebracteata		SCROPHULARIACEAE	bractless hedge-hyssup
	Grindelia integrifolia		ASTERACEAE	gumweed
*	Hedera helix	L.	ARALIACEAE	English ivy
	Heracleum lanatum		UMBELLIFEREAE	cow parsnip
	Hordeum brachyantherum		POACEAE	northern meadow barley
*	Holcus lanatus		POACEAE	velvet grass
*	Hypericum perforatum		HYPERICACEAE	Klamath weed
*	Hypochaeris radicata		ASTERACEAE	cats ear
*	Ilex aquifolium	L.	AQUIFOLIACEAE	English holly
	Iris tenax		IRIDACEAE	Oregon iris
	Juncus balticus		JUNCACEAE	Baltic rush
	Juncus bufonius		JUNCACEAE	toad rush
	Juncus confusus		JUNCACEAE	Colorado rush
	Juncus effusus var. pacificus		JUNCACEAE	common rush
	Juncus ensifolius		JUNCACEAE	swordleaf rush
	Juncus oxymeris		JUNCACEAE	irisleaf rush
	Juncus patens		JUNCACEAE	rush
*	Kickxia elatine	(L.) Dumort.	SCROPHULARIACEAE	
*	Lactuca serriola		ASTERACEAE	prickly lettuce
	Lathyrus angulatus	L.	FABACEAE	peavine
	Lathyrus sphaericus		FABACEAE	grass pea
*	Leontodon nudicaulis		ASTERACEAE	hawkbit
	Linanthus bicolor		POLEMONIACEAE	linathus
*	Ligustrum vulgare	L.	OLEACEAE	common privet
	Lithophragma parviflora	(Hook.) Nutt.	SAXIFRAGACEAE	
*	Lolium multiflorum		POACEAE	Italian ryegrass
*	Lolium perenne		POACEAE	perennial ryegrass
	Lomatium bradshawii		UMBELLIFEREAE	Bradshaw desert parsley
	Lomatium dissectum		UMBELLIFEREAE	dissected desert parsley
	Lomatium nudicaule		UMBELLIFEREAE	barestem desert parsley
	Lonicera involucrata		CAPRIFOLIACEAE	bearberry honeysuckle
*	Lotus corniculatus		FABACEAE	birdsfoot lotus
	Lotus purshianus		FABACEAE	Pursh lotus
	Ludwigia palustris		ONAGRACEAE	false loosestrife
	Lupinus micranthus		FABACEAE	field lupine
	Lupinus sulphureus var. kincaidii	Dougl. * (Smith) Hitchc.	FABACEAE	
	Luzula campestris		JUNCACEAE	field woodrush
	Madia glomerata		ASTERACEAE	cluster tarweed

	Madia sativa		ASTERACEAE	tarweed
	Marah oreganus	(T. & G.) Howell	CONVOLVULACEAE	Oregon bigroot
*	Melissa officinalis	L.	LAMIACEAE	
	Mentha arvensis		LAMIACEAE	field mint
*	Mentha citrata		LAMIACEAE	lemon mint
*	Mentha pulegium		LAMIACEAE	mint
	Microseris laciniata		ASTERACEAE	microseris
	Microsteris gracilis		POLEMONIACEAE	microsteris
	Montia fontana		PORTULACACEAE	water indianlettuce
	Montia linearis		PORTULACACEAE	lineleaf indianlettuce
	Montia perfoliata		PORTULACACEAE	miners lettuce
	Myosotis discolor		BORAGINACEAE	forgetmenot
	Myosotis laxa		BORAGINACEAE	bay forgetmenot
	Myosurus minimus		RANUNCULACEAE	tiny mousetail
	Navarretia intertexta		POLEMONIACEAE	navarretia
	Navarretia minima		POLEMONIACEAE	navarretia
	Navarretia squarrosa		POLEMONIACEAE	navaretia
	Nemophila parviflora	Dougl.	HYDROPHYLLACEAE	
	Omeleria cerasiformis		ROSACEAE	Indian plum
	Oenanthe sarmentosa		UMBELLIFEREAE	Pacific waterdropwort
	Orthocarpus bracteosus		SCROPHULARIACEAE	owlclover
	Orthocarpus hispidus		SCROPHULARIACEAE	owlclover
	Osmorhiza chilensis	H. &. A.	UMBELLIFEREAE	mountain sweet cicily
*	Parentucellia viscosa		SCROPHULARIACEAE	parentucellia
	Paspalum distichum		POACEAE	paspaulum
	Perideridia oregana		UMBELLIFEREAE	yampa
*	Phalaris arundinacea		POACEAE	reed canarygrass
*	Phleum pratense		POACEAE	timothy
	Plagiobothrys figuratus		BORAGINACEAE	popcornflower
	Plagiobothrys scouleri		BORAGINACEAE	popcornflower
*	Plantago lanceolata		PLANTAGINACEAE	ribwort plantain
	Poa nervosa		POACEAE	wheeler bluegrass
*	Poa pratensis		POACEAE	Kentucky bluegrass
	Poa scabrella		POACEAE	pine bluegrass
	Poa trivialis	L.	POACEAE	
	Polygonum coccineum		POLYGONACEAE	bistort
	Polygonum douglasii		POLYGONACEAE	douglas knotwort
	Polygonum hydropiperoides		POLYGONACEAE	marshpepper smartweed
	Polystichum munitum	(Kaulf.) Presl.	POLYPODIACEAE	sword fern
	Polypodium glycyrrhiza	D.C. Eat.	POLYPODIACEAE	licorice fern
	Populus trichocarpa		SALICACEAE	black cottonwood
	Potentilla gracilis		ROSACEAE	northwest cinquefoil
	Prunella vulgaris		LAMIACEAE	common selfheal
*	Prunus avium	L.	ROSACEAE	
*	Prunus domestica		ROSACEAE	cherry
*	Pyrus communis		ROSACEAE	wild apple
*	Pyrus malus		ROSACEAE	wild pear
	Ranunculus alismaefolius		RANUNCULACEAE	plantainleaf buttercup
	Ranunculus aquatilis		RANUNCULACEAE	watercrowfoot buttercup
	Ranunculus flammula	L.	RANUNCULACEAE	

	Ranunculus lobbii		RANUNCULACEAE	Lobb buttercup
	Ranunculus occidentalis		RANUNCULACEAE	western buttercup
	Ranunculus orthorhynchus		RANUNCULACEAE	straightbeak buttercup
	Ranunculus uncinatus		RANUNCULACEAE	tiny buttercup
*	Raphanus sativus	L.	BRASSICACEAE	radish
	Rhamnus purshianus		RHAMNACEAE	cascara
	Rhus diversiloba		ANACARDIACEAE	poison oak
	Rorippa curvisiliqua		BRASSICACEAE	cress
	Rosa canina		ROSACEAE	dog rose
*	Rosa eglanteria		ROSACEAE	sweet-brier rose
	Rosa nutkana		ROSACEAE	Nootka rose
	Rosa pisocarpa		ROSACEAE	peafruit rose
*	Rubus laciniatus	Willd.	ROSACEAE	evergreen blackberry
	Rubus procerus		ROSACEAE	Himalaya blackberry
	Rubus ursinus	Cham. & Schlecht.	ROSACEAE	dewberry
*	Rumex acetosella		POLYGONACEAE	sheep sorrel
*	Rumex conglomeratus		POLYGONACEAE	dock
*	Rumex crispus		POLYGONACEAE	curly dock
	Rumex occidentalis	Wats.	POLYGONACEAE	western dock
	Rumex salicifolius		POLYGONACEAE	willow dock
	Sagina decumbens ssp. occidentalis	(Elliot) T.&G. * (S.Wats.) G.Crow	CARYOPHYLLACEAE	western pearlwort
	Salix lasiandra		SALICACEAE	Pacific willow
	Salix mackenzieana		SALICACEAE	Mackenzie willow
	Salix piperi		SALICACEAE	Piper willow
	Salix sessilifolia		SALICACEAE	willow
	Salix sitchensis		SALICACEAE	Sitka willow
	Sambucus cerulea	Raf.	CAPRIFOLIACEAE	blue elderberry
	Sanguisorba occidentalis		ROSACEAE	burnet
	Sanicula crassicaulis		UMBELLIFEREAE	snakeweed
	Saxifraga oregana		SAXIFRAGACEAE	Oregon saxifrage
*	Senecio jacobea		ASTERACEAE	tansy ragwort
*	Senecio vulgaris		ASTERACEAE	common groundsel
	Sidalcea campestris		MALVACEAE	field checkermallow
	Sidalcea nelsoniana		MALVACEAE	Nelsons checkermallow
	Sisyrinchium angustifolium		IRIDACEAE	common blue-eyed grass
*	Solanum dulcamara		SOLANACEAE	bitter nightshade
*	Sonchus asper		ASTERACEAE	sowthistle
	Spiraea douglasii		ROSACEAE	Douglas spiraea
	Stachys rigida		LAMIACEAE	hedgenettle
	Stellaria calycantha		CARYOPHYLLACEAE	starwort
*	Stellaria media		CARYOPHYLLACEAE	chickweed
	Symphoricarpos albus		ASTERACEAE	snowberry
*	Tanacetum vulgare		ASTERACEAE	common tansy
*	Taraxacum officinale		ASTERACEAE	dandelion
	Taxus baccata	L.	TAXACEAE	English yew
	Tellima grandiflora		SAXIFRAGACEAE	fringecup
*	Torilis arvensis	(Hudson) Link	UMBELLIFEREAE	
*	Trifolium dubium		FABACEAE	suckling clover
*	Trifolium pratense		FABACEAE	red clover

*	Trifolium repens		FABACEAE	white clover
	Typha latifolia		TYPHACEAE	cattail
*	Ventenata dubia	(Leers.) Coss. & Dur.	POACEAE	
	Veronica americana		SCROPHULARIACEAE	American speedwell
	Veronica peregrina		SCROPHULARIACEAE	speedwell
	Veronica scutellata		SCROPHULARIACEAE	marsh speedwell
	Veronica serpyllifolia		SCROPHULARIACEAE	thymeleaf speedwell
	Vicia americana	Muhl.	FABACEAE	
*	Vicia hirsuta		FABACEAE	tiny vetch
*	Vicia sativa		FABACEAE	common vetch
*	Vicia villosa		FABACEAE	hairy vetch
	Viola praemorsa	Dougl.	VIOLACEAE	
	Vulpia bromoides	(L.) S.F. Gray	POACEAE	
	Wyethia angustifolia		ASTERACEAE	narrowleaf mules ears
	Zigadenus venenosus		LILACEAE	death camas

List originally complied by Richard Halse and Kenton Chambers, 1978-1980; updated by Richard Halse, 1994-1998

Nomenclature follows Hitchcock and Cronquist Flora of the Pacific Northwest. University of Washington Press, 1973.

Nomenclature will be brought into conformity with the Oregon Flora Project at the time that the check list is completed.

APPENDIX 13
Bird List

Checklist
Birds of Jackson-Frazier Wetland

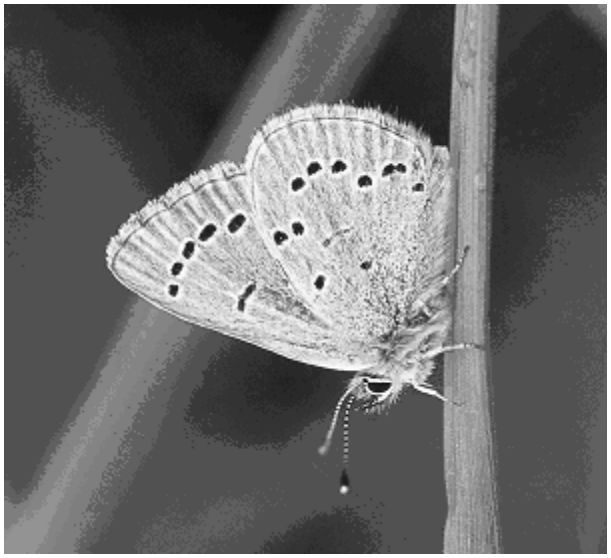
Great Blue Heron—*regular visitor to wet areas and surrounding fields; most common in spring*
Tundra Swan—*winter visitor in large fields NE of wetland*
Wood Duck—*possibly nesting in forested habitat; uncommon visitor at other times*
Mallard—*most common duck; found year-round in emergent and forested areas; possibly nesting*
American Wigeon—*migrant and winter visitor in agricultural field adjacent to wetland*
Turkey Vulture—*common transient from late February to October; often seen flying over wetland*
Northern Harrier—*uncommon transient year-round, seen hunting over emergent and shrub habitats*
Sharp-shinned Hawk—*occasional visitor, seen hunting in forested habitat*
Red-tailed Hawk—*common transient year-round, often seen flying over wetland; may nest in trees*
American Kestrel—*common transient year-round, often seen flying and hunting over wetland*
Merlin—*occasional migrant and winter visitor*
Ring-necked Pheasant—*uncommon resident year-round along shrub wetland edge*
Virginia Rail—*common summer resident in emergent marsh; a few remain in winter*
Sora—*common summer resident in open marsh; less numerous than Virginia Rail*
Killdeer—*common visitor and possible breeder in fields adjacent to wetland*
Dunlin—*winter visitor and possible breeder in open fields adjacent to wetland*
Common Snipe—*common migrant, uncommon winter visitor in wet prairie and open marsh*
Ring-billed Gull—*transient, occasionally seen flying over wetland*
California Gull—*transient, occasionally seen flying over wetland*
Vaux's Swift—*transient, often seen feeding over marsh and shrub habitats late spring and summer*
Rufous Hummingbird—*common spring & summer; perch on small trees & feed on flowering shrubs*
Northern Flicker—*common year-round; large numbers can be found in non-breeding season in trees*
Purple Martin—*rare migrant; male observed April, 1993*
Tree Swallow—*transient; often feeds over marsh and shrub habitats late spring and summer*
Violet-green Swallow—*transient; often feeds over marsh and shrub habitats late spring and summer*
Cliff Swallow—*transient; often feeds over marsh and shrub habitats late spring and summer*
Barn Swallow—*transient; often feeds over marsh and shrub habitats late spring and summer*
Scrub Jay—*common along edge of wetland in shrubs and small trees*
American Crow—*common transient year-round, mostly seen flying overhead*
Black-capped Chickadee—*common year-round resident in larger trees & small shrubs; nests in woods*
Bushtit—*common in forest and shrub habitats; possible nester; flocks roam area in fall and winter*
Bewick's Wren—*common summer resident in drier shrub and woodland; less common in winter*
Winter Wren—*uncommon winter visitor in drier, forested upland areas*

Marsh Wren—*common to abundant resident in open marsh & shrub wetland; less common in winter*
Ruby-crowned Kinglet—*common migrant and winter visitor; shrub and forest habitats*
Golden-crowned Kinglet—*common migrant and winter visitor; shrub and forest habitats*
Swainson's Thrush—*uncommon summer visitor in dense growth of upland forest*
American Robin—*common year-round in all habitats except open marsh*
Varied Thrush—*uncommon to common winter visitor in shrub and forest habitats*
American Pipit—*rare transient; two observed over marsh November, 1993*
Cedar Waxwing—*common summer resident and migrant; found in taller trees*
European Starling—*uncommon visitor found in taller trees*
Hutton's Vireo—*uncommon winter visitor found in taller shrub and forested habitats*
Orange-crowned Warbler—*uncommon summer resident in denser growth areas*
Yellow-rumped Warbler—*common to abundant migrant; scarce winter visitor*
MacGillivray's Warbler—*uncommon summer resident in denser growth areas*
Common Yellowthroat—*common summer resident in open marsh and smaller shrub habitats*
Wilson's Warbler—*uncommon summer resident in denser growth areas*
Black-headed Grosbeak—*common summer resident in larger trees of upland forest area*
Rufous-sided Towhee—*uncommon year-round resident in shrubs and dense overgrowth*
Savannah Sparrow—*uncommon transient along edge of marsh in drier fields*
Fox Sparrow—*common winter visitor in shrub habitat and dense undergrowth*
Song Sparrow—*common year-round resident; abundant winter visitor in shrub and open marsh*
Lincoln's Sparrow—*common migrant and winter resident in shrub and open marsh*
White-crowned Sparrow—*occasional winter visitor in brushy habitat*
Golden-crowned Sparrow—*common migrant and uncommon winter visitor in dense brush, forest*
Dark-eyed Junco—*common migrant and winter visitor in brush and open forest habitats*
Red-winged Blackbird—*common resident found along marsh edges; breeds in wetland*
Brown-headed Cowbird—*common summer resident*
Purple Finch—*uncommon visitor in spring and fall; occasional in winter; may nest in upland forest*
House Finch—*uncommon summer resident; common migrant and winter visitor in and near forest*
Pine Siskin—*transient found in taller trees; abundance varies markedly year to year*
American Goldfinch—*common summer resident; uncommon winter visitor; found in smaller trees*
Evening Grosbeak—*transient found in taller trees; most common mid-to late-April*

Compiled by Hendrik Herlyn
For Benton County Parks
Last revised 1994

APPENDIX 14
Butterflies and Moths of Jackson-Frazier Wetland:

Preliminary Inventory Results From 2003-2004 Surveys



(*Glaucopsyche lygdamus*, male- Photo by Dana Ross)

A Report to Jackson-Frazier Wetland Advisory Committee

By

Dana N. R. Ross, M.S.
(Entomologist/Insect Ecologist)

December 10, 2004

INTRODUCTION

This report presents the results of 2003-2004 surveys for insects at Jackson Frazier Wetland (JFW). This site was one of several chosen for biological inventories of butterflies, moths and dragonflies/damselflies as part of an effort by the author to document these groups throughout Benton County. These concurrent studies are on lands managed by the Natural Areas and Parks Department of Benton County, Oregon. Research activities conducted within Jackson Frazier Wetland must also meet the approval of the Jackson Frazier Wetland Advisory Committee. I thank these organizations for the opportunity to work in one of the few remaining examples of wetland prairie in the Willamette Valley.

Insects make up the largest proportion of animal species within virtually every terrestrial ecosystem. Unfortunately, they are often overlooked in biological inventories as preference is typically given to more charismatic and familiar groups like plants, birds and mammals. In recent years, however, the general popularity of insects, such as butterflies, dragonflies and even moths, has grown to the point where most naturalists and nature watchers are taking notice of them. Furthermore, scientists are now regularly using insects as indicators of environmental health and habitat quality. These trends help to make this study both timely and justified.

Complete inventories of insects usually require many years of sampling effort due to the constant variability in the local abundance and distribution of any single species from year to year. These changes are in response to many physical (e.g. temperature, rainfall) or biological (e.g. predation, competition) variables that are often unpredictable. Also, the distribution of insects across a given landscape is often patchy, with the location of adults coinciding with their larval host plants, preferred nectar plants, or other key resources. The results presented here, therefore, are truly preliminary in nature and represent but a small proportion of the total number of species that call JFW home.

METHODS

Insect surveys began in 2003 upon receipt of collecting permission (by written permit) and are being conducted as time allows on a volunteer, self-funded basis. Most surveys were performed during the 2003 season, although some additional work was carried out in 2004. Initial efforts have focused on moths, as they are the least known and most species-rich of the three groups. Thus far, dragonflies/damselflies have not been specifically targeted.

Daytime surveys for butterflies included walks along the established boardwalk and accessible southern and eastern perimeters, and, to a lesser extent, off-trail meanders within the wet prairie habitat itself. While most species identifications were made by observation, a net was used to catch-and-release specimens of questionable identity. The collection of voucher specimens for each species was undertaken where reasonable and possible. Moths were generally collected at night, by placing battery-operated U.V. light traps in wetland habitat, or, by the individual collection (by hand) of specimens attracted to a white sheet illuminated by U.V. lights at a station located part way out the boardwalk. The latter "sheet collecting" typically took place from late dusk until about midnight, after which all

equipment was removed from the site. Once collected, specimens were placed on insect pins and labeled as a group with the proper collecting data. This form of specimen-based collecting was necessary for definitive species identifications, which were conducted by the author by referencing the Oregon State Arthropod Collection (OSAC) on the OSU campus. Dr. Paul C. Hammond (Oregon State University, Department of Zoology) helped with the particularly difficult moth identifications. Insect records from JFW have been included in the author's Benton County Natural Areas and Parks insect database. This database will be updated annually as new surveys are undertaken and are available to both Benton County and the Jackson Frazier Advisory Committee at their request.

RESULTS & DISCUSSION

Preliminary results from this study include 59 total species for JFW (see Appendix): 7 are butterflies and 52 are moths. It is expected that these species totals will increase substantially as further surveys are undertaken in the coming years.

Butterflies. All observed butterflies (Photo 1) belong to common and widespread species. As such, they will only be briefly discussed here.

Family Hesperiidae- Skippers

1) *Atalopedes campestris* (Sachem) is a small, dull orange to brown species often associated with lawn grasses. There are multiple broods each year. Individuals were observed along the mowed, grassy southeast edge of JFW, directly adjacent to the backyards of several homes.

Family Lycaenidae- Gossamer-wings

2) *Glaucopsyche lygdamus* (Silvery Blue) was observed in the vicinity of lupine, the larval host plant, along the southeast edge of JFW.

Family Lycaenidae- Brushfoots

3) *Limenitis lorquini* (Lorquin's Admiral) is a medium-sized blackish butterfly with large, white bands and rusty-red wingtips. It is a species that is closely associated with willows and was frequently observed perching on the branch-tips of trees and shrubs bordering the raised boardwalk.

4) *Vanessa atalanta* (Red Admiral) is a medium-sized blackish-brown butterfly bearing bold red bands and a few small, white spots. The caterpillars feed on nettles and are associated with moist, riparian environments. The adults, however, are strong flyers and may be found most anywhere. A single adult butterfly was observed visiting tree sap near the beginning of the boardwalk.

5) *Vanessa cardui* (Painted Lady) individuals were observed passing through JFW as part of a mass flight of northward-flying immigrants. This phenomenon occurs periodically when winter/spring rains in the Desert Southwest trigger outbreaks of this very widespread and prolific butterfly.

Family Papilionidae- Swallowtails

6) *Papilio rutulus* (Western Tiger Swallowtail) is a large, yellow and black butterfly commonly associated with willow, alder, ash and maple. It is one of the more

conspicuous summer butterflies of the Corvallis area. It was observed throughout the wetland.

Family Pieridae- Whites & Sulphurs

7) *Pieris rapae* (European Cabbage Butterfly) occurs throughout temperate North America wherever plants of the mustard family occur. The species is most commonly associated with gardens and agricultural fields. It was recorded from the weedy southeast border of JFW.

Moths. The moths of JFW will not be detailed at this time. The majority of moth species are night-active and are rarely seen by most people. Day-flying species are few in number, often brightly colored, and are often mistaken for butterflies. Once inventory efforts are more complete, an analysis of JFW moths will be performed. Photo 2 shows some of the more attractive moths documented to date.

Dragonflies and damselflies. A number of dragonfly and damselfly species may be present on JFW. Some have been observed at a distance, but none have been collected or identified. This group will be more specifically targeted in future surveys.

APPENDIX. *Checklist of insects from Jackson Frazier Wetland, Benton County, Oregon, based on 2003-2004 surveys.*

INSECT TYPE	FAMILY	GENUS & SPECIES
BUTTERFLIES	Hesperiidae	Atalopedes campestris
	Lycaenidae	Glaucopsyche lygdamus
	Nymphalidae	Limenitis lorquini
	Nymphalidae	Vanessa atalanta
	Nymphalidae	Vanessa cardui
	Papilionidae	Papilio rutulus
	Pieridae	Pieris rapae
MOTHS	Arctiidae	Cisseps fulvicollis
	Arctiidae	Clemensia albata
	Arctiidae	Pyrrharctia Isabella
	Arctiidae	Spilosoma virginica
	Geometridae	Campaea perlata
	Geometridae	Cyclophora dataria
	Geometridae	Elpiste lorquinaria
	Geometridae	Euchlaena tigrinaria
	Geometridae	Eulithis xylina
	Geometridae	Eupithecia ravocostaliata
	Geometridae	Gabriola dyari
	Geometridae	Hypagyrtis unipunctata
	Geometridae	Idaea dimidiate
	Geometridae	Orthonama centrostrigaria
	Geometridae	Perizoma costiguttata

	Geometridae	Perizoma curvilinear
	Geometridae	Pero mizon
	Geometridae	Pero morrisonaria
	Geometridae	Protitame matilda
	Geometridae	Sabulodes aegrotata
	Geometridae	Scopula junctaria
	Geometridae	Sicya crocearia
	Geometridae	Synaxis cervinaria
	Geometridae	Xanthorhoe defensaria
	Geometridae	Xanthorhoe munitata
	Geometridae	Xanthorhoe pontiaria
	Lasiocampidae	Malacosoma californicum
	Lasiocampidae	Phyllodesma Americana
	Noctuidae	Agroperina dubitans
INSECT TYPE	**FAMILY**	**GENUS & SPECIES**
MOTHS	Noctuidae	Agrotis ipsilon
	Noctuidae	Agrotis vancouverensis
	Noctuidae	Aletia oxygala
	Noctuidae	Aseptis adnixa
	Noctuidae	Autographa corusca
	Noctuidae	Diarsia Rosaria
	Noctuidae	Egira crucialis
	Noctuidae	Lacinipolia cuneata
	Noctuidae	Leucania anteoclara
	Noctuidae	Leucania farcta
	Noctuidae	Lithacodia albidula
	Noctuidae	Litholomia napaea
	Noctuidae	Palthis angulalis
	Noctuidae	Parabagrotis cupidissima
	Noctuidae	Peridroma saucia
	Noctuidae	Protorthodes smithi
	Noctuidae	Xestia dolosa
	Noctuidae	Zale minerea
	Noctuidae	Zosteropoda hirtipes
	Notodontidae	Clostera apicalis
	Notodontidae	Furcula scolopendrina
	Sphingidae	Smerinthus cerisyi

APPENDIX 15
Communications with Public Agencies

Both the 1992 Management Plan and the present revision of that plan recognized that the health and management of Jackson-Frazier Wetland depended on hydrology and urban development in the watershed. With no jurisdiction over the watershed, the best that Benton County Natural Areas & Parks Department and the Technical Advisory Committee can do is to participate in the planning process and comment on plans that might compromise Jackson-Frazier Wetland water supply. Following established Technical Advisory Committee procedure, the Committee studies and discusses these plans and communicates their recommendations to the Department Director who authorizes Committee participation and communication. **Accordingly, the Advisory Committee has actively commented or participated on the following items, some of which are selected and bolded below and appear in this appendix.**

1. Jackson-Frazier-Sequoia Creek Watershed Council formation
2. City of Corvallis Mitigation sites along Lancaster Drive access to Jackson-Frazier Wetland Committee members continue to be involved with monitoring mitigation sites with help of Cheldelin Middle School students.
3. **North Corvallis Area Plan comments to the NCAP Citizens Advisory Committee**
4. **North Corvallis Area Plan comments to City Council**
5. **Owens Farm Open Space Management Plan**
6. Corvallis Natural Features Inventory
7. Corvallis Drainage Master Plan
8. Frazier Creek Mitigation Bank
9. Albany-Corvallis Rails-with-Trails proposal

Memorandum

January 14, 2002

TO: Jerry Davis, Benton County Parks Department Director
CC Peter Idema, Community Development Department Director:

FROM: Bob Frenkel, Chair Jackson-Frazier Wetland Advisory Committee

TOPIC: North Corvallis Area Plan, City of Corvallis Comprehensive Plan Amendment (CPA01-00004)

Background
The Jackson-Frazier Wetland Advisory Committee discussed the North Corvallis Area Plan (NCAP) a number of times at its 2001 meetings. We prepared detailed comments raising a number of issues relevant to the wetland and attach our comments to this document. These comments were prepared and submitted on June 13, 2001 to the Corvallis Citizens Advisory Committee for the NCAP. We recognize that the current consideration is *de novo.*

As chair of the Jackson-Frazier Wetland Advisory Committee I participated at most of the public workshops and attended several of the Citizens Advisory Committee Meetings. We have reviewed the final plan and proposed changes adopted by the City Planning Commission.

Many of our concerns expressed by memorandum last June persist. We reiterate some of these below. Some of the recommended NCAP policies have been changed, and we believe these changes harm Jackson-Frazier Wetland (JFW).

It is important to realize that all of the water sources feeding JFW emanate or pass through the NCAP area as surface or ground water, and that development of the planning area over the projected 80-year tenure of the plan will affect the health of JFW. The JFW Management Plan addresses the importance of the watershed to JFW with the understanding that the watershed will, over time, be developed. The City of Corvallis needs "…to maintain as near natural drainage in the Jackson-Frazier Creek basins as possible, through setbacks, limiting channelization and reducing, where possible, impervious surfaces." (JFW Management Plan, 1992, page 13) The plan also recommends that the City and County jointly apply for instream water rights to assure future flow to JFW.

Comments on the NCAP as Recommended

- The Jackson-Frazier Wetland Advisory Committee objects to the proposed change "That the Perennial Stream Corridor Overlay (PSC) be applied only to those streams currently identified on the Corvallis Comprehensive Plan Map as Open Space-Conservation (OS-C). Our reasons for objecting are that this change:
  - Potentially threatens the surface water supply upon which JFW depends.
  - Contradicts, in part, the stormwater management techniques that the NCAP adopts.
  - Treats the riparian corridors with the same planning OS-C constraints as open space where as special active management is required to protect and enhance riparian areas in order to reduce sediment load, bank erosion, inappropriate structures, etc.
  - Excludes potential stream corridors from protection by not recognizing the incompleteness of the current inventory. Many of these channels are critical to collecting and conducting surface water upon which the water supply of JFW depends.
- The JFW Advisory Committee regards the setback adopted in the NCAP from the City Comprehensive Plan and Land Use Code is insufficient to adequately protect the water flow into the wetland.
- Planning Alternative Transportation Networks through Owens Farm OS-C portion should give precedence to the City Parks Department so as to develop trail and bike routes that conform to <u>recreation and aesthetic landscape needs</u> not to transportation needs.
    - Highway 99W multimodal trail route that closely parallels the highway (parkway) should be pulled away from the highway and be located in Owens farm in a recreationally more interesting route and link with a yet-to be designated trail from JFW.
- Explicit statements in the NCAP are needed to insure that the trail routes shown on the Alternative Transportation Network map (p. A-63) are conceptual and that actual location will depend on such factors as infrastructure, rights-of-way acquisition, etc. The same principle regarding routes should also be applied to the Transportation Plan map (p. A-51).
- The Recommended North Corvallis Area Plan map shows three "Multi-use trails" in the County JFW. The Advisory Committee and County Parks have not approved of any of these trails.
-
    - These would all be routed through delineated wetland, and extend into private land. Alternative routes would largely avoid the wetland constraints.

- The Infrastructure (Sanitary Sewer and Water) map (p. A-66) shows a line northwesterly through Owens Farm. The JFW Advisory Committee recommends that any plans for having a utility road superimposed on the buried line be surfaced by <u>pervious</u> surface

such as developed by “hollow brick” techniques. The same is true for all infrastructure routes passing though undeveloped land.

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  - JFW depends on ground water as well as surface water and such techniques will help insure round water recharge and diminish erosion, flooding and channel flow.

Attached: Memorandum of June 13, 2001 re. North Corvallis Area Plan (NCAP) from the Jackson-Frazier Wetland Advisory Committee, 6 pages.

PARKS DEPARTMENT
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Memorandum

June 13, 2001

To: **Jerry Davis, Benton County Parks Director**
CC: **North Corvallis Area Plan Citizen's Advisory Committee**
Fred Towne, Plan Coordinator, City of Corvallis
From: **Bob Frenkel, Chair Jackson-Frazier Wetland Advisory Committee**
Topic: **North Corvallis Area Plan (NCAP)**

SUMMARY

This memorandum responds to the NCAP second draft. Jackson-Frazier Wetland Advisory Committee commends the city, its staff, and consultant for the tremendous concentrated effort in producing the NCAP. Following the summary, we discuss in some detail our concerns with the plan.

Planning Process

The NCAP has been weakened by insufficient time to develop the necessary background information, analysis, and full involvement of community.

- **Because of insufficient time, the Jackson-Frazier Wetland Advisory Committee recommends that the deadline for county and city approval of the plan be no earlier than June 30, 2002.**
- Prior to NCAP approval, the county and city need to formalize in a legal MOA regarding how the two bodies will cooperate relative to area plans.
- The Jackson-Frazier Wetland Advisory Committee recommends a schedule for a complete plan review and revision at 10-year intervals.
- Make zone corrections near Owens Farm east and west of Highway 99W.

North Corvallis Area Plan Comments

Hydrology

- Identify on the NCAP maps the county Jackson-Frazier Wetland.
  Jackson-Frazier Wetland Advisory Committee
- Study of the NCAP area prior to plan implementation. Study should focus on groundwater, surface water and water quality.

Transportation and Trail Interconnection

- Delete the "Owens Farm Parkway" route from the northern part of the wetland. The Jackson-Frazier Wetland Advisory Committee opposes through roads across Owens Farm Open Space.
- Our preferred alternative is a road linking Elliott Circle and Highway 99W with Highland Drive, an alternative that avoids Owens Farm.
- Map trail network that interconnects parks, open space, stream corridors and ridges on the NCAP map with associated trail corridors
- Increase width of stream corridors where trails follow streams.

SUPPORTING COMMENTS

Background

Jackson-Frazier Wetland Advisory Committee, a citizen's committee appointed by the Benton County Commissioners, advises the County Parks Director on many aspects of the Jackson-Frazier Wetland. The LCDC mandated Benton County to protect the wetland. On March 8, 1991, the county formally initiated protection by applying Open Space and Wetland Ordinances to the wetland. County Ordinance (91.0083) identifies implementation of zoning regulations to prohibit or limit land uses that conflict with land values for property owned by the county. The Jackson-Frazier-Wetland Management Plan directs the advisory committee to pay particular attention to protection of the wetland water sources.

The advisory committee's perspective is that for the county to protect the wetland, water source integrity must be protected, including ground and surface water supply and quality. By an earlier memorandum dated November 29, 2000, we alerted the NCAP CAC of our concerns and have since participated in the planning process to the extent that we could.

This memorandum responds to the NCAP second draft. It focuses on the planning process, hydrological protection of Jackson-Frazier Wetland, transportation and open space interconnection.

North Corvallis Area Planning Process

- We commend the City of Corvallis for launching the plan process and for their selection of the consultant who has proven to be especially creative and thorough. We appreciate that the consultant's efforts to incorporate a wide range of input received from the CAC, Technical Committee, Community Development staff and public. Particularly noteworthy is the open manner by which the entire public, both city and county were brought into the planning process. Above all, we want to acknowledge the outstanding work of Fred Towne, city staff planner assigned to the project. His handling of public input, maps, e-mail discussion, and web information has been exemplary.

- Despite our genuine praise above, we do have concerns with the North Corvallis Area planning process. There simply was not enough time to allow for necessary background material development, discussion, public, and technical input, and particularly for reflection. The reasons

- For this lie in the terms and timing of the DOT TGM contract. Although budgeted for 24 months, the contract allowed less than 11 months for plan development. This is too brief a time considering the complexity of the issues. Yet, on a positive note, the concentration permitted a focus that has been sustained by all involved parties.

- We are concerned that the public considers the NCAP a "done deal" and therefore feels left out of the process. There have been too many meetings, too close together, with too much material. The public has been deluged with information. The very information load that should keep public involvement open worked against openness. Yes, the public has been able to express ideas but may not believe the ideas were seriously considered.

- Our recommendation to the CAC and city is to regard the consultant's plan as a first step, and to work toward full plan development with the City Council and County Commissioners. Deadline should be no earlier than June 30, 2002. The longer period should accommodate summer schedules. There can be a more careful consideration of public input, additional background development and analysis of alternatives. Having a single plan does not mean that other plan elements should necessarily be rejected. There are many good workable ideas in those other plans that might be useful in the ultimate plan; they should not be discarded.

- A weak element of the planning process was development of assumptions and apparent inability of the public to influence these. Among our concerns are plan area definition, predicted population trends and time frame. There has been little consideration of more realistic time frames, e.g., 10, 20, 30 years, etc. We find a full build out scenario at 50 or 80 years to be not meaningful in the light of almost certain political, technological and social change. There is a time limit to a meaningful plan and this limit has been exceeded with the NCAP.

  The best way to solve this problem is to build into the plan a complete review and revision of the plan at scheduled intervals, e.g., 10-years, 20-years, and 35-years, etc. Without such an update, the plan will become less and less useful as time passes.

- Regarding assumptions, we believe the first assumption should be time frame (now listed third).

- We find the entire planning document as having an unreality because there is insufficient information as to how the county and city will work together. The present interagency agreement is old and not particularly helpful in dealing with how the two governments will work together. Although the county developed an ordinance dealing with "clustering" it is unclear whether this ordinance is enough to guide county development (short of annexation) toward achieving plan goals. Needed for plan implementation is a legal interagency agreement (MOA) furthering county-city coordination toward achieving the plan.

- Although in the 06/09/01 plan map draft shows a partial zone correction east of Highway 99W and south of Elliott Circle, there still are errors. Marys River Lumber should probably be incorporated into the Limited Industrial – Office (LIO) zone. Land immediately south and adjacent to the lumberyard was part of the city acquisition of Owens Farm and is owned by the Greenbelt Land Trust. Ultimately, ownership may pass to the city or county. A more correct zone for this property would be Open Space – Conservation (OS).

- We note the north Owens Farm north boundary is mapped in error. It should not extend north of Jackson Creek (across from Elliott Circle). Correct boundaries are available from the city.

Hydrological Protection of Jackson-Frazier Wetland

- Although not formally in the NCAP study area, Jackson-Frazier Wetland is critical to the plan as borne out by the many references to this county resource.

  We formally request that the county Jackson-Frazier Wetland be outlined and identified by name on the NCAP maps. Benton County Parks can provide the extent of the delineated wetland and the county ownership. Roughly, 130 acres of wetland east of U.S. Highway 99W are currently either under county, city or Greenbelt Land Trust protection. I was surprised to find that many NCAP participants misidentified the county wetland as the undelineated wetlands spanning Jackson and Frazier Creeks west of the highway. The formal name for the county wetland is singular – "Jackson-Frazier Wetland".

  An example of the confusion on Jackson-Frazier Wetland appears under the "Natural Resource Areas 4.2 A) Advisory Constraints" note on wetlands. Our understanding is that all mapped wetlands as shown in the NCAP were not delineated but were mapped by DSL's off-site methodology. Some of these wetlands may have been delineated for other purposes, e.g., the Greenbelt Land Trust Owens Farm wetlands were delineated east and west of Highway 99W.

- Jackson and Frazier Creek hydrology is critical to the continuity and protection of the county wetland. No hydrological study has been conducted for either watershed, no gauging stations have been established. The best available information is from a few modeling studies of surface flow. Some of this general information is incorporated into the Storm Water Master Plan now nearing completion.

  It is well established that development severely impacts seasonal distribution of flow, water quantity and water quality in urbanized watersheds. Changes in these hydrological inputs could adversely impact the county wetland. Our concern is with both surface flow and groundwater.

  David D'Amore's thesis on stratigraphy and hydrology of the Jackson-Frazier Wetland, (D'Amore 1997 and D'Amore et al. 2000) identified groundwater as critical to the saturation of Jackson-Frazier Wetland. Groundwater derived from the watershed flows into the wetland through buried silts 4-5 feet below the surface. Its seasonal pattern differs from surface water. No attention has been paid to groundwater in the NCAP other than indirectly by recommending green infrastructure and associated BMPs.

  In a very preliminary water quality study in 1999, Crescent Valley High School students identified deteriorating water quality in Jackson Creek and the role of the county wetland in improving water quality for selected nutrients.

  Hydrological information will help establish a rationale for riparian buffers (presently based on "seat of the pants" city ordinances). Certain fish-bearing and near-permanent streams probably should have wider buffers than minor ephemeral channels. Hydrological background will assist in ways of maintaining groundwater infiltration. For example, attention might focus on retaining undisturbed soils, altering tree canopy density and implementing mechanisms to enhance groundwater inputs, particularly on soils with high permeability.

- What the forgoing discussion points to is that we know the watershed and watershed processes are critical to the continuity of the wetland but we lack detailed hydrological knowledge of the tributary watersheds. It seems shortsighted on the part of the city to launch a 50- to 80- year plan without the necessary background information. We recommend that the city initiate a hydrological study of the NCAP area before plan implementation.

- The stated probable impacts to Jackson-Frazier Wetland of the "Owens Farm Parkway" (Transportation p. 5, paragraph 1) is in direct conflict with the LCDC mandate to protect the wetland as a Goal 5 resource. A large area of impervious surface will be introduced with questionable functioning of bioswales for poorly drained soils.

Transportation

- The single most important transportation issue before our committee has been the proposed route through Owens Farm Open Space. We do not dispute the need for at least one east-west road connection with Highway 99W and Highland Drive.

- The Jackson-Frazier Wetland Advisory Committee is opposed to a connector road through Owens Farm. The so-called "Owens Farm Parkway" through the northern third of Owens Farm is unacceptable to our committee.
  - Owens Farm forms an extremely attractive visual backdrop for Jackson-Frazier Wetland and is often commented favorably by visitors. The proposed road in the NCAP would visually destroy this amenity value.
  - Although routed to skirt probable wetlands constraint in the NCAP map, the road threatens to thwart county and Greenbelt Land Trust responsibility (obligation with OWEB that provided $25,000 for this purpose) which is to restore the agricultural wetland just down slope of the proposed road. Our concern has to do with blockage of sheet flow and lateral groundwater movement that partly feeds this delineated wetland. It is very unclear how the impervious surface and ditching associated with the Owens Farm Parkway will affect the adjacent restoration project.
  - City staff suggested that one of the reasons for the proposed Owens Farm Parkway route is the easy grade for bicyclists. We find this reason unconvincing given that (a) Highway 99W and Owens Farm Parkway intersection at this location leads nowhere except a busy highway; (b) there are other more desirable alternative routes for cyclists; and (c) the road route will be used mostly by cars and be avoided by cyclists.
  - Voters in the successful Open Space Ballot measure were not told that a road would bisect Owens Farm and destroy a picturesque vista. In fact, one of the main selling points for the open space bond measure was that Owens Farm would provide an unencumbered rural "gateway" to Corvallis. No city bond measure literature gives any sense of an understanding that a road would cross the center of Owens Farm Open Space.
  - Donors to the Greenbelt Land Trust acquisition (almost $1,000,000) were never informed that a road might be placed adjacent to land that they purchased. In fact, the Owens Farm Parkway route shown on the NCAP map now threatens the credibility of the Greenbelt Land Trust and the City of Corvallis in their relation to the public.
  - The NCAP CAC has not made public their reasons for the road location recommendation.
  - Constraints and road route alternatives having less impact on Owens Farm.

- In an earlier plan for Owens Farm (Dunning PUD), a road route was planned to follow the swale south of the open space unit and connect with Satinwood Street, Lester Avenue extension, and Highway 99W. Wetland constraints (hydric soils, NWI, and LWI) would need to be dealt with. Route adjacent to swale, however, would avoid wetlands. The grade could easily be negotiated by cyclists. Highway 99W intersection would be about 2/3 of a mile north of Elks Drive. The Jackson Frazier Wetland Advisory Committee does not favor this route but recognizes it as an alternative.
- Our preferred alternative is a road linking Elliott Circle and Highway 99W with Highland Drive. This route avoids Owens Farm. It follows the proposed N-S proposed road joining Mountain View Drive and Satinwood Street and the existing east-west road near Crescent Valley HS and Shasta Drive. The route could curve into Elliott Circle-Highway 99W intersection. This route would facilitate a four-way intersection with Highway 99W and Elliott Circle. As with almost all road routes, wetland constraints would have to be considered and dealt with.
- Sewer and water line placement need not follow roads. Their routing can be much more flexible than planning for roads. They can be located with minor visual, hydrological and ecological impacts. On the other hand roads will have major visual, hydrological and ecological impacts and must be considered in a broader context.

- Under 5.5 Recommendations – Road Network Item 1, nothing is said about the county transportation plan. Under Item 2, nothing is said about development and road networks not impacting opens space units and parks.

Parks, Open Space and Natural Resources

- Although 285 acres of riparian are mapped in the NCAP representing corridors and buffer areas, the plan text is unclear as to whether the corridor is 175' wide or 350' wide.

- Whether 175' or 350', the drainage corridor is unlikely to be wide enough to contain enough space for a multipurpose trail. Where there is a coincidence of recreational trail with drainage, the corridor should be wider. A way of handling this would be to reserve extra width by making the trail system corridor additive to the drainage corridor width where the two corridors coincide.

- Plan text frequently mentions integration of a multipurpose recreational trail system with the transportation network, parks, open space, drainage corridors and ridges yet the proposed 13.5 mile trail network is not shown. Recreational corridor width is not shown or discussed. A trail plan is available from City Parks and relevant portions of the trail plan should be incorporated into the NCAP map with associated corridors. It surprised us that there was no suggestion of trail buffer between adjacent land uses. This concept certainly should be incorporated into the plan. The trail network in the NCAP should be handled in the same manner as the proposed road system. Incorporating trails into the plan will be in line with the DOT TGM grant. It will also show whether the city's trail master plan meshes with the NCAP. Furthermore, it may assist various parties to acquire or dedicate corridor right-of-ways in a compatible manner with the NCAP.

- General park location is suggested on the plan map but only existing parks/open space is spatially defined. It would help on the map if, at least, one could see what size park is proposed rather than just an asterisk. We recognize that the text portion of the plan provides some information about these proposed parks.

PARKS DEPARTMENT
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MEMORANDUM

February 20, 2001

To: **Jerry Davis, Benton County Natural Areas & Parks Director**
CC: **City of Corvallis Parks & Recreation Department Attention Karen Emery, Plan Coordinator**
From: **Bob Frenkel, Chair Jackson-Frazier Wetland Advisory Committee**
Topic: **Owens Farm Open Space Management Plan (OFP)**

This memorandum responds to the Draft Report and Assessment Report for Owens Farm. The Jackson-Frazier Wetland Advisory Committee is advisory to the Benton County Natural Areas & Parks Director and commends the city parks staff and consultant for their efforts in producing the assessment and draft plan, that will also serve as templates for other open space units. Much critical information for planning purposes is brought together in these documents. Some of it will assist the county in its ongoing planning of the wetland.

Relationship of Owens Farm to Jackson-Frazier Wetland

Owens farm is the key landscape feature affecting Jackson-Frazier Wetland embracing direct relations to water quantity, quality, seasonality, soil development, historic context and visual quality of the `wetland. The Jackson-Frazier Wetland Committee has emphasized the key role of this open space unit to all of these landscape aspects as any walk around the wetland will demonstrate. The wetland visitors are constantly commenting on the importance of the visual qualities of Owens farm.

In the OFP we found insufficient attention paid to those biophysical conditions and landscape features as the following comments will bring out.

Hydrology

- Study of the NCAP area prior to plan implementation. Study should focus on groundwater, surface water and water quality.

  The advisory committee's perspective is that for the county to protect the wetland, water source integrity must be protected, including ground and surface water supply and quality. By an earlier memorandum dated November 29, 2000, we alerted the NCAP CAC of our concerns and have since participated in the planning process to the extent that we could.

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APPENDIX 16
Comments from the Public on the Plan

Benton County citizens have been intimately involved in the management of Jackson-Frazier Wetland since its inception. An element of the original Task Force Management Plan, depended on public involvement. Input from the public was common and intense, especially regarding wildlife and firearms. Upon completion of the draft 1992 plan a formal public meeting was held to receive further comments that were later reviewed by the Technical Advisory Committee in 1993 to isolate issues needing consideration. Since 1993 the Technical Advisory Committee has averaged more than nine meetings per year from 1993 to 2004. All meetings have been announced and posted ahead of time and various interested individuals have attended and provided input on management.

Likewise, the public has been welcome to comment on the present revised management plan. A formally announced public meeting (Newspaper notice and article) was held January 12, 2005 in the evening at Cheldelin Middle School. A summary of comments follows.

January 12, 2005 Public Meeting on Jackson-Frazier Management

- Citizen Questions and Comments
- Input is welcome and will be incorporated in the plan as appropriate before Planning Commission review and Board of Commissioners adoption
- Plan will be on Benton County website as a public resource
- ***Q/C = Question/Comment; R = Response***
    - *Q/C – How is restoration or replacement (rotting boards) funded (boardwalk maintenance and replacement)?*
    - R - Boards should have 30-year life; 4" thick; deal with aging facilities; part of budget process - Jackson-Frazier Wetland Trust Fund
    - *Q/C – Safety concerns, issues considered; has anyone complained about height of sides; has anyone fallen off or had problems*
    - R – "Toe Rails" – tested by wheelchair-bound person; recommended security of higher toe rails and widened boardwalk
    - *Q/C – Owens Farm Management Plan language – important for Greenbelt Land Trust, City and County to work together, structure joint management process; suggest putting in specific language about the 3 entities working together*
    - R - GLT contact attends J-FWAC meetings; recommend having City Parks liaison to J-FWAC (along with GLT person), to establish linkage
    - *Q/C – Frosty mornings – boardwalk is slick, especially in shaded areas*
    - R – Detector at boardwalk entrance shows that it may be freezing, icy; sand piles utilized previously; could be reinstated
    - *Q/C – Connectivity – conceptual and general discussion; negotiations with willing landowners; specific discussion with City, GLT, other partners, e.g. Owens Farm connection*

- R – Hwy 99 and railroad = issues, barriers, safety concerns; have proposed using light at Elliott Circle for connection; would mean ODOT, RR, City and County work together; would also include some access within wetland;
  Rails with Trails proposed project, application for funds; linkage Corvallis to Albany, with use of Cheldelin fields; public lands trail; then, needs to connect to Owens Farm
- *Q/C – Other ways of getting across highway – tunnel?; sewer trunk ends at Lancaster, extended towards north Corvallis for future development; if goes under highway, could possibly have walkway under highway as well?*
- *Q/C – What about an overpass?*
- R – Looked into it, both too costly.
- *Q/C – Vandalism problems?*
- R – Yes, some, not too extensive, but discouraging; general parks policy is to take care of vandalism immediately; frequent use of area by public helps "police" area
- *Q/C – Other research interests (in addition to Cheldelin Middle School)?*
- R –Yes, CVHS students; Elementary Schools; 4-H groups; Corvallis Environmental Center/Avery House; OSU projects, including Graduate/PhD – hydrology, etc.
- *Q/C – Restoration activities, invasive species control is very expensive – how funded? Do you have benchmarks to measure success or failure?*
- R – USF&W partnerships provides cash, labor and equipment; pilot project; J-FW fund incorporates donations; Federal funding through Soil & Water Conservation, WHIP, other funding; Institute for Applied Ecology – assessment and recommendations; In Wetland Prairie Unit, initiated mowing, clearing, spray; invasive rose species causing problems;
- *Q/C – How to keep this a wetland while development takes place all around; control water, influences around watershed*
- R – Of course, there won't be a wetland if no water flows from upstream; it is up to public and "constituents" of the wetland to be involved and take action protect such areas. We rely on the wide-ranging influence of community leaders to point the way.
- *Q/C – Does Comprehensive Plan protect riparian areas?*
- R – Planning by itself does not protect riparian. City and County are both updating their comprehensive plans in which considerations of planning for urban growth, Natural Features Inventory are steps in protecting riparian areas but in themselves are probably not sufficient
- *Q/C – Put website on front of plan*
- *R—Excellent idea*

Written Comments from the Public

Jackson Frazier Wetland Management Plan

Public review comments
Submitted by: R. Foster

Jan 14, 2005

Dear JFWAC,

Thank you for the work in drafting, editing and presenting this update.

I failed to note in the plan where it says the wetland is wheel chair accessible? This is a huge asset to this area.

I reviewed the appendix sections first in order to better understand the chapter sections. I note the plan does not clearly provide detail about adjacent land use projections for the near future. Plans such as the North Corvallis Area Plan (NCAP), OSU MacDonald Dunn Plan, and Natural Feature Inventory Land Development Code Phase III have the potential to impact the wetland.

Area land use in future is out of the scope of this plan, but land use plans could be listed in some way to show the reader how the watershed, Crescent Valley is to be impacted by planned and passed into Ordinance land use in the near future.

The Frazier Creek Mitigation Bank and any future protection of Frazier Creek Ditch and Frazier Creek to Bower Slough and the Willamette River will be important to consider in terms of aboriginal species diversification and for providing a clear/accessible hydrologic connection to the wetland in the winter from the Willamette River. The Frazier Creek/Frazier Ditch riparian corridor has great potential for enhancement and near term easement establishment for the entire corridor length.

Corridor protection in the Crescent Valley (CV) drainage is not consistent. Jackson and Frazier Creek as the NCAP is influenced by the Corvallis Parks Plan, Corvallis Transportation Plan and the Natural Features Inventory allow these creeks to be fragmented.

Riparian corridor in the CV watershed are protected at various widths on paper and in a percentage of these creeks drainage the NFI Land Development Code - Phase III has overlayed the Conservation Open Space (C-OS) Distinct.

This C-OS District allows outright by the City or a private developer: May 27, 2004 version:

"Chapter 3.38
Conservation – Open Space (C-OS) District
3.38.20.01 – General Development

a. Primary Uses Permitted Outright
   1. Civic Uses:
      - Community Recreation – limited to trails
      - Minor Utilities – limited to above ground storm water detention ponds and facilities installed underground such as water, sewer, storm, gas, and electric lines and associated elements, such as underground lift stations, pump stations, or vaults;
      - Construction of streets, roads, and pedestrian crossings that are included in the City of Corvallis Transportation Plan, or in other adopted City Plans; and

- Construction of streets, roads and vehicular and pedestrian crossings necessary in order to maintain an acceptable functional classification of roadways adjacent to the property:

2. Prior Established Uses
   - Uses existing prior to Dec. 31 2004, and in compliance with the Code on that date, and
   - Uses permitted by Code at the time of approval of a Conceptual Or detailed development plan overlying the subject property.

b. Accessory Uses Permitted Outright
   1. Essential Services

3.38.20.02 - Special Development - Uses Allowed Through Discretionary Review

a. Type I – Conditional Development – Subject to review in accordance with Chapter 2.3 – Conditional Development
   1. Civic Use Types
   - Community Recreation (limited to picnic areas not to exceed 1 picnic table per 5 acres)

Section 3.38.30 - Performance Standards

Each use, activity, or operation within this zone shall comply with applicable local nuisance and animal control ordinances, State and Federal standards, and other provisions of this Code."

In the 2004 draft of the JFW Plan on page 26, paragraph three:
"The City of Corvallis also applies a Significant Stream Corridor Overlay designation to perennial streams included in the Open Space Conservation designation, which includes Jackson and Frazier Creeks…" "…these designations are intended to protect water quality of the streams, mitigate development impacts, and conserve riparian vegetation."

From the May 27, 2004 City definition of Conservation Open Space (see above) it is designating the utilization of the lowest gravitational (topographic) areas for the installation of gravity feed utility infrastructure (and piggy backed infrastructure such as gas, water, electric, recreational trails, pump substations, fiber optic cables…) and the placement of both public and private roadbed/access/regress and allows both public and private trail systems (which must be accessible by service vehicles) to be located in the riparian corridor/flood plain of both Jackson and Frazier Creek and within these two creeks confluence west of 99W.

There is planned in the NCAP and NFI LDC - Phase III on paper there is a lack of consistent corridor width protection for these very narrow riparian area creeks in Crescent Valley. These corridor widths vary by land zoning and type of ranked protection given these reaches in the NFI.

This indicates the NFI is implementing the North Corvallis Area Plans footprint for infrastructure location in this area. Flood pulse hydrology may have to be captured within the Crescent Valley basin. Engineered wetlands may be needed to attenuate and hold floodwaters in the valley as build out hardens large areas of Crescent Valley and these two area streams have fully and rapidly been allowed to disconnect from their floodplain.

In future, CO-S District could be overlayed onto the majority of both Jackson and Frazier Creek and create problems with losses to this riparian corridor ecology. Erosion in channel will rapidly degrade these small streams. The North Corvallis Area Plan guides/plans the footprint location for road and trial location to cross over and closely follow both Jackson and Frazier Creek. This projected land use fragments riparian corridors and reduces the natural hydrologic efficiency of these floodplain and riparian areas.

Trail lay out:

Proposed Trail corridor locations from Crescent Valley to Highway 99W as specified in the North Corvallis Plan and Map 5 trail plan should be removed from within Jackson and Frazier Creek's riparian corridor and placed on existing roadway and in high ground areas such as ridgeline and hill slopes. Trails use-be an overlay on top of new road systems exclusively as these roadways will be inevitable placed near both Jackson and Frazier Creek. We do not need more surface hardening in these riparian corridors.

Future impacts of trials the size of roadbeds at the confluence of Jackson and Frazier Creek will displace and interrupt this large floodplains function. Floodwater displacement by roadbed trail fill will assist in redistributing hydrology into new areas on the Owens parcel or may increase erosion on the JFW parcel, as this is an outfall for the 99W culvert

Trails need to follow old road beds, and be located out of floodplains and removed from riparian corridors as these corridors are narrow and will become narrower as they down cut (erode in channel to bed rock) due to flash flood pulses from NCArea, and OSU Mac and Dunn Forests as this watershed is more intensively harvested, housed and urbanized.

Trails continued:

In the JFWPlan, Measure 21 page 88. I disagree with the proposed trail location as presented on Map 5. The confluence, ash swale flood plain for Jackson and Frazier Creek is very important to conserve and an asphaltic roadbed with fill should not bisect, divide, fragment or impact this hydrologically dynamic floodplain area. With build out in Crescent Valley this confluence area will possibly expand due to more run off depositing and passing into this low lying area.

Beaver engineering in this area will possibly be impacted with any City of Corvallis Parks Dept. roadbed construction as trail system as passed into law/Ordinance/guidance within: the Corvallis Transportation Plan, Corvallis Park and Rec. Plan, NFI LDC Phase III 2004, North Corvallis Area Plan and the Hospital plan . Trials sighting can easily in my view utilize and follow existing historic roadway, roadbed and follow topographic contours on higher ground ridge areas and be built away from this sensitive riparian corridor. This confluence area has several road beds already established which connect the Owens parcel to its highest elevation ridgelines. Work by GBLT in this low-lying area at the confluence of Jackson and Frazier Creek could be compromised by trail road building in the name of vehicle accessible trail and application of the Conservation Open Space District to this confluence floodplain area.

Beaver extripation will have to occur if the City builds roadbed trails in this area, so this is an issue that will be hard to face as they animals provide an ecologic dynamic and are protecting the health and well being of this unique area.

Hydrology:

Currently headwater reaches of Crescent Valley small creeks and streams are, or have reached bed rock and with build out in the Crescent Valley area the lower laying streams such as, Sequoia, Jackson and Frazier Creek will carry on degrading and disconnect themselves from their floodplain if they have not done so during build out for these two creeks entire reach lengths. Build out in this area is estimated at 50 years. Currently, considering combined land use influence on the valley floor and headwater land use at this time, both Jackson and Frazier Creek are degrading.

Dixon Creek at its headwaters below I.V. hill is badly down cut and increase in channel width expansion at bedrock. Erosion in channel for Dixon Creek is rapid and ongoing due to significant surface hardening and rerouting/obliteration of area historic drainage patterns. Dixon Creek headwater channel is widening and eroding more and more of its channel walls due to development adding flow to and taking flow way from this drainage corridor.

Flooding downstream in Dixon Creek will continue to increase due to this disassociation of drainage way and drainage area connections from this headwater area floodplain/water tables.

Could this plan better describe how the JFWAB works? What is the history of this board? Who <u>was</u> on the board, who <u>is</u> on the board? This information will further support your connection to the community.

Can other land use documents be listed and briefly described as to their impact on the wetland? Owens Farm, City of Corvallis NFI, OSU Mac Dunn Forest Master Plan, North Corvallis Area Plan (includes City Transportation Plan, City Parks and Recreation Plan, NFI LDC Phase III 2004 Ordinances), Frazier Creek Mitigation Bank plan, Hospital plan? For expansion, Paulish-Legend Homes build out and Kings Blvd. construction into Crescent Valley that is projected to degrade further the headwaters of Dixon and Sequoia Creeks, Benton County Trail Plan 2003, Corvallis Storm Water Master Plan, and other plans not cited in this comment.

Ownership map information:
I am interested in seeing land ownership information for land adjacent to the JFW. Map 4 is Ownership but is missing EFU to the east and north. Does one EFU owner own the land to the east and north?

Railroad concerns and Rails with Trails observations:
With the Eugene switch yard being decommissioned more train traffic is being directed to rail lines throughout the valley to switch, wait/store or pick up cars. Granger rail siding near Garlands has increased in use this year and so with this use increase possibly the Rails with Trails ideas will have to be considered with regard to personal safely as these two lines may in fact be increasingly more used by trains because of the loss of the Eugene switch yard. With truck traffic on highway set to triple on all freight routes, rail line use may become increasingly more in demand to reduce pressure on state roadway.

With build out of million plus square feet distribution warehouse in Lebanon, and one probably set to be build for Home Depot south and west of HP, live rail line trial use by humans should be carefully considered as rail service to these mega warehouse may depend on rail line transportation as roadway degrade under triple use by trailers. Rail lines will have to connect to these massive facilities as citizens pay more taxes to repair and maintain road, suffer high fuel costs, live with air quality degradation, noise issues in communities from truck routes, congestion, active rail lines will have to connect to these massive facilities to relieve roadway of trailer traffic.

Upland topography should be considered:
Since the wetland has so few upland areas, and these few, geographically separated uplands at this time support T and E and State Listed species. The railway fill to the west supports and creates upland. Upland is found in the majority of the east Owens Greenbelt parcel. Plans should be considered to utilize all upland in this area for enhancement or establishment of native rare or endangered upland botanic species. New Rails with Trails fill could possibly if planned could support more upland creation and enhancement areas for T and E and state listed species.

Corridors with T and E botanic species are being used by flying insect species to access T and E plants. Corridor habitat creation that takes into consideration this dynamic may be highly successful in helping T and E plants and their associated very rare T and E insect species.

Owens Greenbelt east parcel contains upland. This plan does not define plans for use of this parcel when it is donated in future to Benton County to become part to the JFW complex. Should this plan at this time plan for use of this very important upland area?

Showy Milkweed may be established to increase flyway nectar sites for Monarch. Showy Milkweed has not been reported inside JFW but could be established. Showy Milkweed is found near Adair and along 99W near Lewisburg, Oregon. Showy Milkweed is critical for plant dependent Tetripies beetle and Monarch butterfly. Showy milkweed if at all possible should be encouraged to establish in JFW.

Brush piling near/adjacent to the boardwalk will enhance bird watching options. Brush piles provide refuge and potential nesting or territory marking/singing/perch spots for avian species.

Dog on leash information should exclaim clearly how important Dog on Leash regulations are as this boardwalk is a physical intrusion into this wetland and by allowing Dogs off leash, each individual owner is responsible for decreasing the opportunity for the next board walk user to

actually see, observe and enjoy discovery of unharashed wildlife. Dog fecal deposition could also be described clearly to each user as being detrimental to the wetland as water pollution contribution.

With no monitoring or enforcement it is up to each individual user to obey and understand how his or her use actions impact the wetland as a healthily functioning resource. Ecologic degradation of the boardwalk area could occur with more dogs off leash disturbing species constantly.

This is currently an increasing management problem at MROP east of Brooklane Drive as dogs are run off leash and constantly interrupting the dynamics of renewing/reestablishing bird life ecology in this area once farmed as EFU.

Dog owners think it is their right to run their dog freely at the MROP nature preserve area. Wildlife and avian species will continue to be physically stressed at this location with build out of more boardwalk and bisection of the flood plain by trail construction. Deterioration of water quality and area ecology could be enhanced in this area due to human and dog use and flood plain area development.

Signage/Kiosk information:

Signage at the start of the JFW boardwalk I feel should say, NO SMOKING.

At the kiosk:

It would be nice to try to provide bird checklists, or show folks what plant and animals they can expect to see in what season in the kiosk. What types of fish are in this area for example? What types of insects are present at what time and were are they found? What created this wetland? Are there any glacial erratics in the wetland? What birds have been seen here in the past?

Could have changing/rotating list of things to find, hear, touch, and discover on a self guided tour as guest enjoy the boardwalk.

Establishing hydrology monitoring gauge stations:

Stream data does not exist for the North Corvallis area the City may never record flow information for example as they apply the NFI and North Corvallis Area Plan. The NCAP contactors advised in their opening remarks that the City needed to consider undertake such monitoring.

So at this time stream gauges may be placed at CVHS-Dan Bregar to carry on the yearly work of CVHS- Field Biology Class observations from this point for real time data collection for stream volume data. Gauges should be located on Frazier Creek as well and at the best locations a hydrologist suggests in order to have historic data to be able to present the City of Corvallis as they implement NFI and the NCA Plan. Without this guiding historic data the wetland may be less able to legally, or otherwise defend itself against abuse by the City of Corvallis, and other landowners in the area.

OSU will in the next master plans application beginning at this time to apply scheduled increase harvest on these ridgeline in Crescent Valley and this will directly impact these headwater drainage: Calloway, Alder, Frazier and Jackson Creek.

Gauge stations set up at this time may record these upcoming headwater land use change and be reflective of change as hydrologic as land use intensifies in Crescent Valley.

An area landowner had a well dry up after clear cutting by OSU. So, water issues are a reality in this area with this ridgeline hill slope land use becoming intensive Forestry.

I suggest that CVHS possibly has a working water volume gauge set up and not running which could be brought on line permanently as a part of this Advance Biology Classes data collection process. Yearly donation of funds could be made to CVHS from Benton County in order to maintain this gauge. Gauge at this location will record data and store it in a data logger or even send it to a computer location for real time viewing. Jackson Creek at this point has been documented to flow at the surface all year long.

Additional gauges could be added to Greenbelt parcel for example and possibly in the wetland at various locations.

False brome:

Waterway function to bring seed and plant rhizome of this highly invasive species to the wetland. The County and Volunteers may have to work with City of Corvallis as roadway in these creek corridor areas are built and disturb occurs in the riparian corridor of both Jackson and Frazier Creek. False broom may at this time, Jan 2005 be established in these riparian corridors.

Currently, False brome remains unchecked and rampant in the OSU headwater ridgeline areas of Frazier and Jackson Creek and is spreading downhill into private land in this watershed. Vigilant attention is suggested to be paid to new infestation points for false brome along drainage way in the wetland.

Thank you for your efforts in implementing this plan on the landscape! I look forward to enjoying wondrous ecology and learning about nature in action in the wetland.

Regards, Rana Foster 1415 SW Brooklane Dr. Corvallis, Oregon.