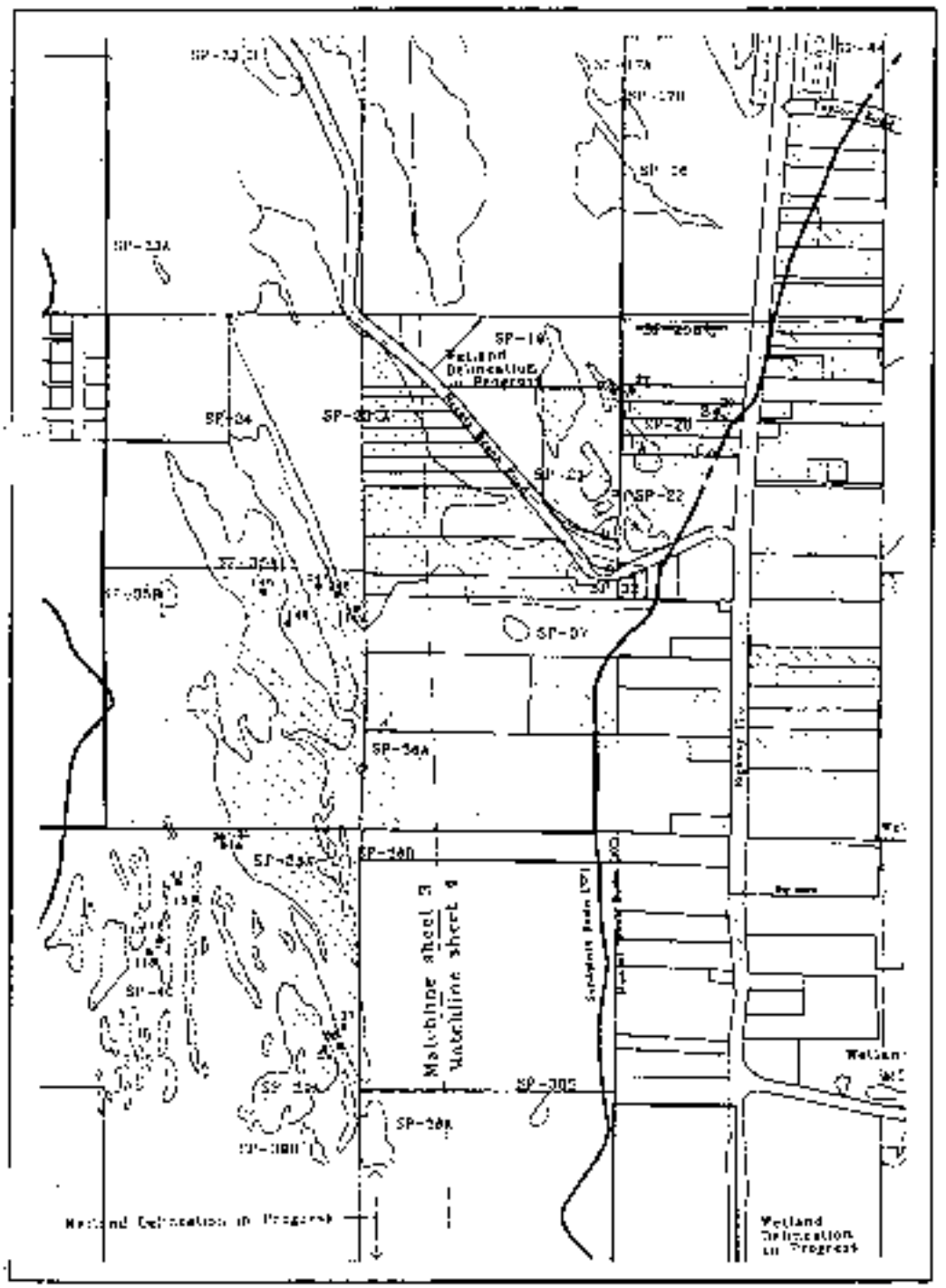
City of Florence
Local Wetlands
and
Riparian Area Inventory



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December 30, 1996

PHS

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1.0 INTRODUCTION

On December 1, 1995, the Oregon Division of State Lands (DSL) awarded a grant to the Lane Council of Governments to conduct Local Wetlands Inventories (LWI) in the Cities of Florence and Dunes City. Both of these communities are currently working with the Oregon Department of Land Conservation and Development to update their comprehensive plans. Part of this periodic review requires revisions to Goal 5 (*Open Spaces, Scenic and Historic Areas, and Natural Resources*) of Oregon's Statewide Planning Goals. The objective of this goal is to conserve open space and protect natural and scenic resources. Complying with Goal 5 requires an inventory of the location, quality and quantity of wetlands within a jurisdiction. The LWI, which attempts to identify the location and assess the quality of all wetlands within the Urban Growth Boundary, satisfies the requirements of this goal.

In April 1996, Pacific Habitat Services, Inc. (PHS) was selected to conduct the LWIs in Florence and Dunes City. PHS was also hired to inventory and assess the quality of riparian areas within the two cities. This report presents the results of the wetlands and the riparian inventories conducted in the City of Florence. A separate report was prepared for Dunes City.

This report begins by discussing the definitions used in the report and inventory (Section 2), followed by the methodology used to conduct the field work for the LWI and the riparian inventory, the wetland and riparian assessment methodology, and the methodology used to produce the maps for the inventory (Section 3). Section 4 discusses the study area characteristics, such as the climate, topography, soils and vegetation, as well as the possibility of rare, threatened, or endangered species. Section 5 discusses the Local Wetlands Inventory results, including wetland distribution, acreage, and Cowardin classification. This section also includes the results of the Oregon Freshwater Wetland Assessment Methodology. Section 6 discusses the riparian inventory and assessment results, Section 7 is a project summary and Section 8 is the report references.

There are five appendices to the report. Appendix A contains the wetland determination data forms. These forms document the sample points taken for the on-site wetlands. Hydrology, soils, and dominant vegetation are recorded for each sample point in order to determine whether it is wetland or upland.

Appendix B contains the wetland characterization sheets for each wetland or group of similar wetlands, organized by wetland code. The characterization sheets note wetland location, tax lots, acreage, Cowardin classification, soil series, wetland vegetation, adjacent upland vegetation, and other notes related to adjacent wetlands, hydrology and/or the presence of an uncommon wetland plant community. This form was completed for each wetland unit, regardless of whether it was an on-site or off-site determination.

Appendix C is the Oregon Freshwater Wetland Assessment Methodology data and summary for each wetland unit. Each wetland's functions and conditions are assessed according to an established state methodology. The results and rationale are also summarized for each wetland unit.

Appendix D contains the riparian inventory data. This form documents the riparian location, adjacent waterbody, the presence of adjacent wetlands, channel characteristics, dominant riparian vegetation, and riparian measurements. Each riparian area is assigned a unique code.

Appendix E contains the riparian assessment questions, riparian assessment results, and riparian assessment summary. Each riparian area's functions are assessed using a series of questions developed for the inventory. The assessment results and rationale are also summarized.

2.0 DEFINITIONS

These definitions were used to conduct the Local Wetlands Inventory and the riparian areas inventory in Florence and are used in this report.

Wetland

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.* (Federal Register 1982).

Wetlands Regulation

> *Wetlands in Oregon are regulated by DSL under the Removal-Fill Law (ORS 196.800-196.990) and by the U.S. Army Corps of Engineers (Corps) through Section 404 of the Clean Water Act.*

1987 Manual

> The *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (Environmental Laboratory 1987).
>
> This manual is used by the Corps and DSL to document the location of wetlands within the State of Oregon. The 1987 manual provides technical criteria, field indicators, and recommended procedures to be used in determining whether an area is a jurisdictional wetland. Undisturbed areas require three criteria for them to be classified as wetland. These criteria are hydric soils, a dominance of hydrophytic vegetation, and wetland hydrology.

Hydric Soils

> *Soils which are ponded, flooded, or saturated for long enough during the growing season to develop anaerobic conditions.*

Periodic saturation of soils causes alternation of reduced and oxidized conditions which leads to the formation of redoximorphic features (gleying and mottling). Mineral hydric soils will be either gleyed or will have bright mottles and/or low matrix chroma. The redoximorphic feature known as gley is a result of greatly reduced soil conditions which result in a characteristic grayish, bluish or greenish soil color. The term mottling is used to describe areas of contrasting color within a soil matrix. The soil matrix is the portion of the soil layer that has the predominant color. Soils which have brightly colored mottles and a low matrix chroma are indicative of a fluctuating water table.

Hydric soil indicators include: organic content of greater than 50% by volume, sulfidic material or "rotten egg" smell, and/or presence of redoximorphic features and dark soil matrix, as determined by the use of a Munsell Soil Color Chart. This chart establishes the chroma, value and hue of soils based on comparison with color chips. Mineral hydric soils usually have a matrix chroma of 2 or less in mottled soils, or a matrix chroma of 1 or less in unmottled soils.

Wetland Hydrology

Permanent or periodic inundation or prolonged soil saturation sufficient to create anaerobic conditions in the soil.

Wetland hydrology is related to duration of saturation, frequency of saturation, and critical depth of saturation. The 1987 manual defines wetland hydrology as inundation or saturation within a major portion of the root zone (usually above 12 inches), typically for at least 12.5% of the growing season. The wetland hydrology criterion can be met, however, if saturation within the major portion of the root zone is present for only 5% of the growing season, depending on other evidence.

Hydrophytic Vegetation

Plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

The U.S. Fish and Wildlife Service, in the *National List of Plant Species that Occur in Wetlands*, has established five basic groups of vegetation based on their frequency of occurrence in wetlands. These categories, referred to as the "wetland indicator status," are as follows: obligate wetland plants (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and obligate upland (UPL)

Indicator Code	Status
OBL	Obligate wetland. Estimated to occur almost exclusively in wetlands (>99%)
FACW	Facultative wetland. Estimated to occur 67-99% of the time in wetlands.
FAC	Facultative. Occur equally in wetlands and non-wetlands (34-66%).
FACU	Facultative upland. Usually occur in non-wetlands (67-99%).
UPL	Obligate upland. Estimated to occur almost exclusively in non-wetlands (>99%). If a species is not assigned to one of the four groups described above it is assumed to be obligate upland.
NI	Has not yet received a wetland indicator status, but is probably not obligate upland.

Growing Season

The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biological zero (41° Fahrenheit, 5° Celsius).

The growing season for any given site or location is determined from U.S. Soil Conservation Service (SCS) data and information. The length of the season can be approximated from frost free days, based on air temperature.

Wetland Classification

The classification of wetlands as defined by plants, soils and the frequency of flooding is described in "Classification of wetlands and deepwater habitats of the United States" (Cowardin, et. al. 1979).

Riverine System

Includes all wetlands and deepwater habitats contained within a channel but not including palustrine emergent, scrub-shrub or forested wetlands, or estuarine systems. The riverine system is generally all freshwater rivers, creeks and their tributaries.

Lacustrine System

Includes areas where there is an area of open water greater than 20 acres, and which is unvegetated by trees, shrubs, and persistent emergents, emergent masses or

lichens. Lacustrine waters may be tidal or nontidal, but ocean derived salinity is always less than 0.5%.

Palustrine System

All nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens and all such wetlands that occur in tidal areas where salinity is less than 0.5%. This includes areas traditionally called swamps, marshes, fens, as well as shallow, permanent or intermittent water bodies called ponds.

Unconsolidated Bottom

All wetland and deepwater habitats with at least 25% cover of particles smaller than stones, and a vegetative cover less than 30%

Aquatic Bed

All wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. This class includes rooted and floating vascular plants, as well as algal beds and aquatic mosses.

Emergent Wetland

These wetlands have rooted herbaceous vegetation which stand erect above the water or ground surface.

Scrub-shrub Wetland

Wetlands dominated by shrubs and tree saplings that are less than 20 feet high.

Forested Wetland

Wetlands dominated by trees that are greater than 20 feet high.

Local Wetlands Inventory

An inventory of all wetlands greater than 0.5 acres in size within a local jurisdiction using the standards and procedures of OAR 141-86-110 through 141-86-240.

In 1989, the Oregon state legislature authorized DSL to develop a statewide wetlands inventory for planning and regulatory purposes. Accordingly, DSL established Local Wetlands Inventory (LWI) standards and guidelines under ORS 196.674. An approved LWI replaces the National Wetlands Inventory maps and is incorporated into the statewide wetlands inventory.

An LWI is conducted using color or color infrared aerial photographs taken within 5 years of the inventory initiation and at a minimum scale of 1 inch = 400 feet (1" = 400'). Wetlands are located using the on-site option where access to property is allowed or off-site where access is denied. Wetlands can be mapped off-site by using information such as topographic maps, aerial photographs, soils surveys, and the National Wetlands Inventory quadrangles.

The approximate location of wetlands at a scale of 1" = 400' is placed on a parcel-based map. The parcel-based map allows the property owner, the local jurisdiction, and DSL to know which tax lots may contain wetlands.

The maps and documents produced for the LWI are intended for planning purposes only. Mapped wetland boundaries are accurate to within 25 feet, however there may be unmapped wetlands which are subject to regulation. In all cases, actual field conditions determine wetland boundaries.

Wetland Assessment

Determining the relative quality of a wetland by assessing its functions and conditions.

The methodology generally used to determine the relative quality of wetlands for purposes of an LWI is the Oregon Freshwater Wetland Assessment Methodology (Roth, et. al. 1996).

Wetland Function

A characteristic action or role associated with a wetland that contributes to a larger ecological condition such as wildlife habitat, water quality and/or flood control.

Wetland Condition

The integrity of a wetland's physical and biological structure. This determines the ability of the wetland to perform specific functions, as well as its resilience and enhancement opportunities (Roth et al., 1996).

Riparian Area

The area of transition from an aquatic ecosystem to a terrestrial ecosystem adjacent to a river, lake, or stream.

Riparian areas provide erosion control, sediment filtering, forage and cover for wildlife habitat; as well as food, shade and large woody debris for fish habitat. It also provides water storage.

3.0 PROJECT METHODOLOGY

3.1 Public Involvement

Prior to beginning the inventory, the Lane Council of Governments and the City of Florence mailed letters to selected landowners who may have wetlands on their property. Landowners who had areas of mapped hydric soils, soils with hydric inclusions, National Wetlands Inventory mapped wetlands, or suspected wetland areas received a notice of permission for site access.

Landowners who would not allow PHS to access their property were requested to give notice to City staff. Those allowing access did not need to take any action. A parcel-based map of the urban growth boundary of Florence was prepared showing those parcels where access was approved, denied or an appointment was requested. These property boundaries were transferred to aerial photographs and used in the field by PHS staff during the inventory.

Three public meetings were held during the course of the inventory. The first meeting was held on May 2, 1996, to introduce the project to the residents of Florence. This meeting was held prior to the date required for return of the access request letters to answer any questions affected landowners may have for representatives of the City of Florence, the Lane Council of Governments, PHS, or DSL.

The second public meeting was held on Saturday, August 3, 1996, to show the residents of Dunes City and Florence how the inventory process was conducted by the staff of PHS. The field trip focused on selected wetland and riparian areas of Florence.
The third public meeting was held on October 16, 1996, to present the draft results of the wetland and riparian inventory to the residents of Florence. Changes made to the maps at the public meeting and verified in the field, appear on the final version of the maps included with this report.

3.2 Local Wetlands Inventory

3.2.1 Routine Off-site Determination

Prior to beginning field work, off-site mapping was conducted to determine the approximate location of wetland boundaries based on available information. This information included the USGS topographic quadrangles, the *Soil Survey of Lane County Area Oregon* (SCS, 1982), the National Wetlands Inventory maps, and color aerial photographs at a scale of 1" = 400'.

If access to land was allowed, the wetland boundaries were verified in the field (see Section 3.2.2). If access was not granted, the boundaries were based on the mapping conducted in the office, on observation of wetland boundaries from adjacent roads or properties and on an aerial reconnaissance conducted over the Florence-Dunes City area.

3.2.2 Routine On-site Determination

Where property access permission had been granted, on-site observation and inspection of soils, vegetation, and hydrology were made using the Routine On-site method of the 1987 manual. Soil pits were excavated to a depth of approximately 18-inches in selected locations. The soil profiles were examined for hydric soils and wetland hydrology field indicators. A visual percent-cover estimate of the dominant species of the plant community for a maximum 30-foot radius was conducted at each sampling location. Sampling locations were chosen to document a change in the wetland boundary and a particular plant community visible on an aerial photograph. Data was recorded in the field and transferred to computer-generated wetland delineation data sheets (included in Appendix A) in the office.

Field work for the inventory was conducted between May and November 1996. No wetland boundaries were staked or flagged in the field.

3.3 Wetland Quality Assessment

3.3.1 The Oregon Freshwater Wetland Assessment Methodology

The quality of wetlands in the study area were assessed using the *Oregon Freshwater Wetland Assessment Methodology* (OFWAM) (Roth et al. 1996). OFWAM was developed by an interagency committee to assess the relative quality of wetlands primarily for planning and educational purposes. Copies of the methodology are available from DSL for a fee. OFWAM does not assign a numeric ranking to the wetlands, but does determine the relative quality of six functions and three conditions for each of the wetlands. A description of each of the functions and conditions is included below.

Wetland Functions

Wildlife habitat: Evaluates the habitat diversity for species usually associated with wetlands, without emphasizing one particular species. Wetlands assessed by OFWAM can provide diverse habitat for wildlife, habitat for some wildlife species, or does not provide habitat.

Fish habitat: Evaluates how a wetland contributes to fish habitat in streams, ponds or lakes associated with a wetland. The questions are suitable for both warmwater and coldwater fish and no particular species is emphasized. Wetlands assessed by OFWAM can have fish habitat function intact, impacted or degraded, or lost or not present.

Water Quality: Evaluates the potential of a wetland to reduce the impacts of excess nutrients in stormwater runoff on downstream waters. A wetland's water quality function can be assessed by OFWAM as intact, impacted or degraded, or lost or not present.

Hydrologic control: Evaluates the effectiveness of a wetland to reduce downstream flood peaks and store floodwaters. A wetland's hydrologic control functions can be assessed by OFWAM as intact, impacted or degraded, or lost or not present.

Education: Evaluates the suitability of a wetland to provide educational opportunity and act as an "outdoor classroom." A wetland assessed by OFWAM can have educational uses, have the potential to provide or not be appropriate for educational uses.

Recreation: Evaluates the suitability of a wetland and associated watercourses for non-powered boating, fishing, and similar recreational activities. A wetland assessed by OFWAM can provide, have the potential to provide, or not provide recreational opportunities.

Wetland Conditions

Sensitivity to Future Impacts: Evaluates the wetlands ability to sustain itself and its ability to recover from future impacts. It is an indication of risk to the wetland because of future changes in the watershed and surrounding land. A wetland can be assessed by OFWAM as sensitive to future impacts, potentially sensitive to future impacts, or not sensitive to future impacts. An undisturbed forested wetland is more sensitive to future impact than a wetland which has already been disturbed, such as agricultural wetland.

Enhancement Potential: Evaluates the suitability of a degraded wetland for enhancement. A wetland providing this condition does not provide one or more of the functions assessed by OFWAM. A wetland fulfilling this condition, therefore, would be of lower overall quality than a wetland providing wildlife habitat, fish habitat, etc. Wetlands which provide diverse wildlife habitat were not assessed in this section, as per the revised OFWAM. Wetlands are assessed as either high enhancement potential, moderate enhancement potential, or little enhancement potential.

Aesthetic quality: Evaluates the visual and aesthetic quality of the wetland. Wetlands can be considered pleasing, moderately pleasing, or not pleasing.

3.3.2 Wetlands of Special Interest for Protection

The first filter in OFWAM is to determine whether the wetland is in a management plan, is protected by regulatory rules or statutes, or is uncommon in Oregon. Ten questions are answered for each wetland and a "yes" answer to any of the questions puts the wetland into the "special interest for protection" category. If the wetland falls into this category, it is noted on the wetland characterization sheet.

3.3.3 Field Methodology

During the process of determining the boundaries for the LWI, data were also collected for the process of determining its relative quality. Data collected for this purpose are explained in the *Wetland Characterization* section of OFWAM. Data collected in the field included the number of wetland classes, the types of disturbance (if any) in the wetland area, the hydrology of the wetland area (e.g. the location of constrictions), the presence of fish, large

woody debris, the degree of vegetative cover, and other information necessary to complete the assessment of the wetland in the office.

If the wetland determination was off-site, the OFWAM section and wetland characterization was based on review of the aerial photographs, the aerial reconnaissance flight, and knowledge of other similar or adjacent wetlands.

3.3.4 Office Assessment

Subsequent to the field work, the data collected for each wetland were used to answer questions for each function and condition. Additional information on the wetlands, the landscape and the general area were gathered in the office. The answers within each function and condition section of the methodology were entered into a computer spreadsheet, which automatically displays the results of the assessment methodology.

Certain criteria were established for the OFWAM assessment prior to beginning. The following is a list of certain standards which were used in answering the questions:

All areas were considered as "urban areas" even though they might be outside the UGB or were in undeveloped areas of the city (Wildlife question 1, 4, and 9; Aesthetics, question 6) and were considered to be in an "urbanizing" area (Hydrologic control, question 7).

If a wetland was adjacent to a lake it was considered to have more than 1 acre of unvegetated open water present (Wildlife, question 4).

The Oregon Department of Environmental Quality considers the Siuslaw River and the North Fork Siuslaw River to be water quality limited (ODEQ, 1996). The Siuslaw River from its mouth to its headwaters is considered to be water quality limited due to high temperatures in the summer. The North Fork Siuslaw is considered to be water quality limited due to habitat modification, high amounts of sediment, and high temperatures in the summer.

This information was used in the following questions in OFWAM: Wildlife, question 7; Fish Habitat, question 4; Water Quality, question 6; and Sensitivity to Future Impacts, question 3. However, it appears that OFWAM contains an error for Wildlife, question 7 and Fish Habitat, question 4. If these questions were answered according to the current OFWAM, it resulted in several wetlands receiving a "lower" functional assessment. Based on discussions with DSL and Emily Roth, principal author of OFWAM, these answers were reversed for the Florence LWI, so that good water quality received an "A" and water quality limited received a "C" in the Wildlife and Fish Habitat sections. Other questions related to water quality were not changed.

3.4 Riparian Inventory

A riparian inventory and assessment was conducted as part of this project for Munsel, Clear, Ackerley, and Collard Lakes, Munsel Creek and five un-named drainages in the Florence

project area. Riparian assessments were conducted for representative stretches of drainages which connected wetlands, or are adjacent to perennial streams or lakes.

Riparian areas are transitional between aquatic and terrestrial environments, providing a variety of functions that include wildlife habitat, flood storage and amelioration, thermal regulation of adjacent water bodies, contribution of large woody debris and organic material, erosion control, and bank or slope stabilization. During the riparian inventory PHS assessed not only the physical characteristics, but also the functional state of the riparian corridors based on a series of qualitative questions related to riparian functions and conditions.

In order to assess the physical character of a riparian area, a standardized assessment sheet was developed for on-site use which summarizes channel characteristics, dominant riparian vegetation, and estimated riparian measurements. Channel characteristics include channel width and depth, bank condition, percentage of shade, dominant riparian classification (similar to the Cowardin classification for wetlands), the presence of large woody debris, channel substrate, and the degree of human channel modification (e.g. culverted, channelized). The dominant riparian vegetation was listed according to strata, similar to the wetland characterization. Riparian measurements included estimates of riparian width based generally on an estimated horizontal distance from the top of bank to a break in slope, and a horizontal distance to the top of the slope or drainage watershed. In addition, general notes were made about the location of the riparian area, associated wetlands, and adjacent land-use.

3.5 Riparian Quality Assessment

In addition to the standard assessment sheet, a series of questions relating to riparian functions were developed in order to assess the overall health or functional 'value' of the riparian areas. These questions are divided into the following functions: thermal regulation, erosion control, flood control/water quality, and wildlife habitat. A description of each of the functions is included below.

Riparian Functions

Thermal Regulation: the ability of the riparian area to provide thermal regulation for the adjacent water body. This is important for fish habitat and water quality. Functional assessment is based on the dominant vegetation type and height, percent shade, slope, and degree of disturbance.

Erosion Control: the ability of the riparian area to provide bank or slope stability, and sediment removal. This function is dependent on adjacent slope angles, degree of disturbance, bank condition, soil type and percent of vegetation cover.

Flood Control/Water Quality: the ability of the riparian area to withstand flooding, provide floodwater storage and desynchronization of peak flows, and remove sediments and nutrients. This function is dependent on the percent of woody vegetation, the presence of associated wetlands, the floodplain width, and the presence of physical flow restrictions.

Wildlife Habitat: the ability of the riparian area to provide food, cover, and nesting areas, protection from predators, and separation from humans. This function is dependent on vegetation diversity, the presence and duration of water, the presence of large woody debris, the presence of associated wetlands, the width of the riparian area, structural diversity, and the degree of disturbance.

An assessment of high, moderate, or low functional value was then determined for each of the riparian areas. Off-site riparian assessments were based on review of aerial photographs and available maps.

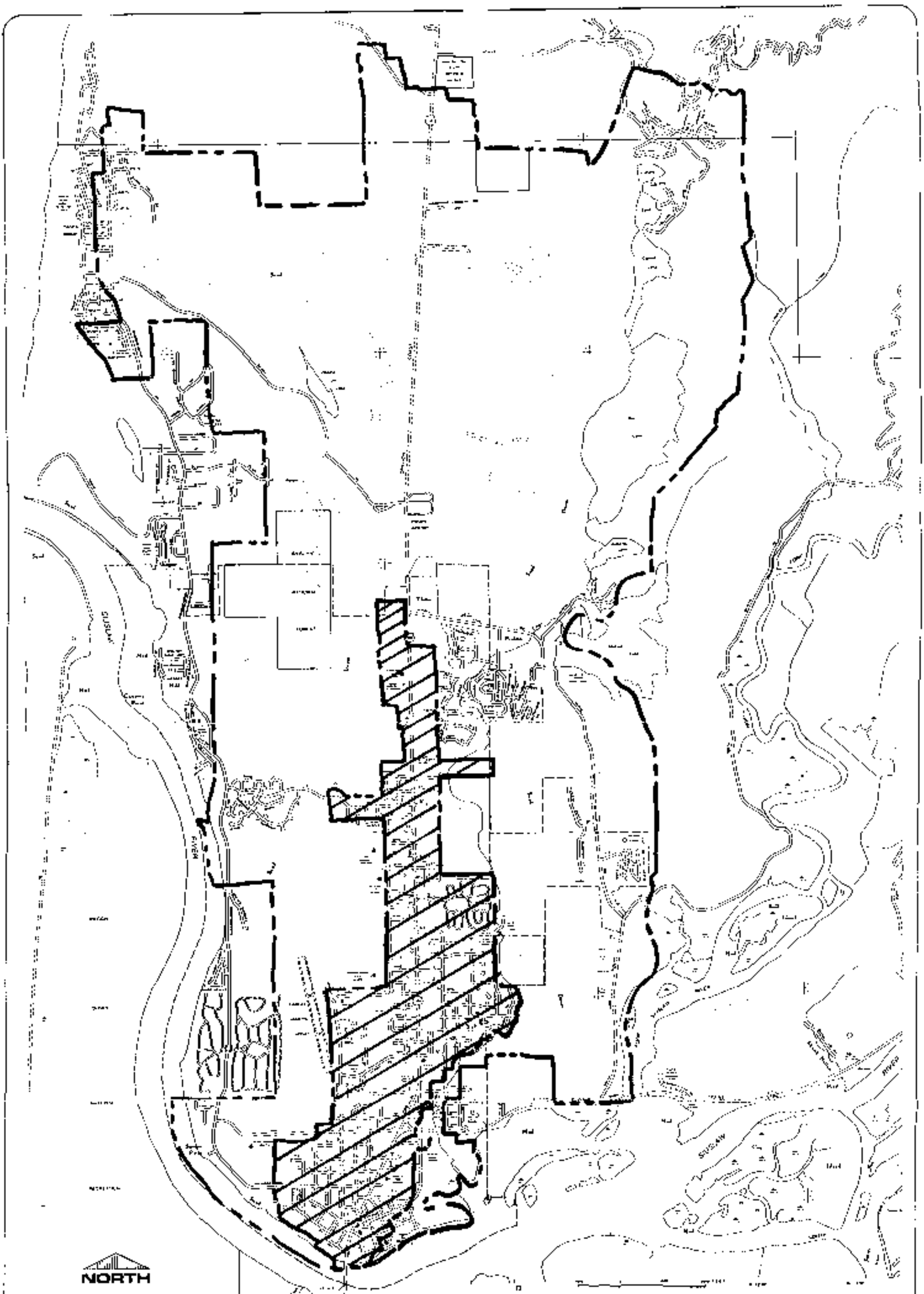
3.6 Cartography

Color copies of aerial photographs were used in the field. These maps are 1995 true color, and are approximately 1" = 400'. Clear acetate was overlaid and permanently registered on the photographs and preliminary wetland boundaries and data point locations were drawn directly on the acetate in the field. In addition, areas within the project area to which permission to enter was granted were drawn on the acetate overlays. These acetate sheets were then removed from the photographs at the completion of field work and scanned into a digital format and inserted into the computer-based base map.

The base map information was provided by Lane Council of Governments and the City of Florence. Base map data included a hard copy and an electronic copy of the parcel-base tax lots, hydric soils, soils with hydric inclusion, the NWI mapping, the project boundary and various geographic names. A copy of the Urban Service Area Storm Drainage map was provided which had topographic information for the area within the city limits. Topographic information for areas outside the city limits was not available. The electronic base information was transferred from a .DXF file to AutoCAD drawing (.DWG) files. The scanned wetland boundaries were then inserted as a separate layer.

Additional layers added onto the AutoCAD base map included drainage basin boundaries, streams from the USGS, additional geographic names, wetland codes, and sample point locations. Each wetland was assigned a code beginning with the three letter watershed designation and the number of wetlands within each watershed (e.g. AIR-# for Airport, NS-# for North Fork Siuslaw). Wetlands that were hydrologically connected but separated by roads, culverts, or riverine systems were labeled with a code modifier (e.g. AIR-2A, 2B). Due to the number of small, isolated wetlands in the Florence area, several wetlands were combined under the same code if they were in the same general geographic area and had similar characteristics. In general, sample points were numbered consecutively from south to north. In addition, on-site determinations and previous delineations were shown with different hatch overlays.

The riparian mapping was drawn on the 1" = 400' base maps and scanned into the digital base as a separate layer. The riparian areas were labeled with a riparian code beginning with the letter "R" and followed by the watershed code and a number (e.g. RAIR-#). Riparian



DATE:

BASE MAP INFO:

JOB NO.:

Florence LWI
Project Area

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, Oregon 97070
Phone (503) 570-0800

Fig. 1

assessment locations were noted on the maps. Wetland boundaries are included within the riparian areas, however, each are designated with a different hatch-pattern overlay.

4.0 STUDY AREA CHARACTERISTICS

4.1 Setting

4.1.1 Culture and Industry

The City of Florence is named after a lumber ship that wrecked along the shore in 1875. The City is located north and east of the Siuslaw River, east of the Pacific Ocean and west of the North Fork Siuslaw River. U.S. Highway 101 runs north-south through the approximate center of the city. The general location and project boundary area is shown on Figure 1.

In 1959, the population of the City of Florence was estimated to be 1,775. By 1994, the population of the city was over 6,000. Population growth in the city has exceeded the growth rate of the state and Lane County. During the 1990s, the growth rate of Florence also exceeded all other Oregon coastal towns except Brookings, which exhibited a similar growth rate. Between 1980 and 1990 the population has grown most notably among those over 75 years of age, which has risen 126 percent in the 10-year period.

The major industries in the city have changed in recent decades from the timber and fishing industries to retail trade and the manufacturing of durable goods. The major occupation of the residents is in the service, sales, and administrative support services.

4.1.2 Climate

The Florence area has a temperate marine climate. The average annual precipitation is approximately 65 inches. Approximately 50 inches of rainfall typically occurs between October and March. The wettest month is usually December, with over 11 inches of rain in a typical month. In 1994, the Florence area received almost 56 inches of rain, approximately 9 inches below normal. In 1995, the total was 89.58 inches, almost 25 inches above normal. For the period of January through March, 1996, the rainfall total was 34.13 inches, approximately 6 inches above the typical 28 inches for the same period.

The mean annual temperature is approximately 50 degrees Fahrenheit. The warmest months are usually July and August, with typical average maximum temperatures of just above 60 degrees Fahrenheit.

4.1.3 Geologic Setting

The Florence area lies on a bed of sand (called the Florence dune sheet) up to 200 feet thick, but with an average thickness closer to 100 feet. Beneath the sand is a terrace comprised of sedimentary rocks, volcanic fragments, and marine sediments approximately 30 million years old. The sand which underlies Florence originated inland, but was transported to the ocean by

the Siuslaw and other coastal rivers. Strong ocean currents keep the sand that is transported down the rivers relatively close to shore. The sand, which is of Quaternary age (less than a million years old), consists primarily of quartz, but with magnetite, epidote, zircon, and feldspar also present. The sand grains vary in size from medium to very fine and are subangular to rounded.

The Florence area contains a series of sand dunes, both advancing and stabilized. Sand dunes have formed in the Florence area over the last 7,000 years from material that has been eroded over many millions of years (Oregon Dunes National Recreation Area, 1996). Dunes found closest to the ocean are generally foredunes. The foredune's origin comes from the success of European beach grass (*Ammophila arenaria*), which was introduced in the early 1900s to stabilize the sand. This aggressive grass grows quickly binding the sand particles and creating a relatively stable surface. As the foredune grows taller it cuts off the supply of sand to the dunes further inland. As the wind continues to blow, areas behind the foredunes often become scoured. This scouring is often of sufficient magnitude to reach the groundwater table. This flat wet area is called a deflation plain and may contain many species of plants tolerant of the wet conditions. Foredunes can reach heights of over 35 feet.

Inland of the deflation plain are other types of dune formations called transverse dunes, barchan dunes, oblique dunes, precipitation ridges, and parabola dunes. Transverse dunes are formed by the northwest winds of summer. These dunes require an abundant source of unvegetated sand. They form as small ridges at right angles to the wind. The slope facing the winds rises gradually, but the other side drops off steeply. With sufficient wind, the sand which blows over the top of the dune forms another transverse dune approximately 75 to 150 feet away. These transverse dunes are partly destroyed by the winter winds, which blow from the southwest.

Sand which accumulates on obstructions such as trees or rocks are called barchan dunes. These dunes are in a crescent shape, with the two points of the crescent pointing away from the wind direction.

In Florence, summer winds blow at a relatively constant 12 to 16 miles per hour from the north and northwest. Winter winds blowing from the south and southwest are generally lighter, but during storm events can exceed 100 miles per hour. Sand transported by winds from both directions at different times of the year form oblique dunes. These dunes, which are peculiar to Oregon, can be as high as 180 feet and can extend up to a mile in length. The sands of these dunes moves constantly, making it difficult for vegetation to become established. The east side of the dunes is usually higher and steeper than the west side, which forms a long, sloping ridge.

Precipitation ridges are formed when the sand reaches the edge of a forest. The sand carried by the wind is dropped at the base of the trees creating a ridge. Precipitation ridges can form many miles from the ocean.

Another dune formed at the forest edge is the parabola dune. This dune forms in the holes or gaps left in the forest due to a loss of trees often caused by excessive winds. Sand piles up in the open area of the forest due to the surrounding vegetation acting as an obstacle. This type of dune is often the highest of the various dune formations.

4.2 Topography

Elevations within the Florence study area range from sea level to approximately 495 feet. Elevations in Florence increase gently from the ocean to the base of the bedrock ridges that form the edge of the dune sheet along the eastern study area boundary. The highest elevations in the study area are along a ridge east of Clear and Collard Lakes, at the eastern edge of the study area.

4.3 Hydrology

4.3.1 Hydrologic Features of the Florence Area

Hydrologic features of the Florence study area include: the Pacific Ocean; the Siuslaw River, which flows along the southern and western edges of the city; the North Fork Siuslaw River, which flows south along the eastern edge of the city; Collard, Clear, Ackerley, and Munsel Lakes, a series of hydrologically connected lakes along the eastern boundary of the study area; Munsel Creek, a perennial stream channel flowing south from Munsel Lake into the Siuslaw River; and relatively large shallow lakes and ponds formed in the dunes.

The origin of Collard, Clear, Ackerley, and Munsel Lakes is the same. The lakes formed along the eastern margin of the dune sheet, between the accumulation of sand to the west and the impermeable bedrock to the east. The energy of the wind transporting sand to the west is deflected upward into the surrounding hills. The sand being carried by the wind is dropped, creating a ridge near the base of the hills. Between the ridge of sand and the hills is a depression or series of troughs. Collard, Clear, Ackerley, and Munsel Lakes all formed in this depressional area.

Clear Lake is over 80 feet deep and Munsel Lake is 71 feet deep. Water flows out of Collard Lake into Clear Lake through a small drainage channel. Water flow is a relatively constant 1 to 2 cubic feet per second. Water continues south into Ackerley Lake and Munsel Lake and into Munsel Creek, which eventually drains into the Siuslaw River. The average annual discharge of Munsel Creek is 3,000 acre-feet.

The source of hydrology for the creeks and lakes of the Florence area is groundwater. The dune sand which underlies Florence is moderately permeable and allows infiltration of large amounts of rainfall. It is estimated that over 55 inches of the 65-inch average annual rainfall goes to groundwater recharge. Each square mile of the dune sand produces approximately 2.7 million gallons per day (Hampton, 1963). Consequently, the water supply for the Florence area is drawn from the dunal aquifer, which stretches approximately 50 miles along the coast. The Heceta Water District draws water for domestic uses from Clear Lake in the northeast

corner of the study area. The quality of the water is generally good. The water is soft and weakly acidic, but can contain high amounts of iron. A high iron content is especially noticeable beneath wetlands and other bodies of shallow water.

Groundwater movement in the Florence area flows downward toward the edges of the dune sheet. Water drains out of the dune sheet south into the Siuslaw River, east into the North Fork Siuslaw River, or west into the Pacific Ocean. There is relatively little overland flow due to the high permeability of the sand. Only during times when excess rainfall has completely saturated the sand does water flow over the surface. The lack of well-defined tributaries to the streams and lakes is an indication that much of the water reaching the channels is through groundwater flow and not through surface water.

The water table adjacent to Munsel Creek and four other unnamed creeks in the project area is generally higher than the stream levels. During periods of sufficient recharge, the water table discharges into the creeks. However, during the summer months when the precipitation levels are low, the water table falls below the level of some of the creeks and water ceases to flow.

4.3.2. Drainage Basin Designation

The study area was divided into eight drainage basins based on the City of Florence Storm Drainage Map. These drainage basins and their size are listed in Table 1 below:

Table 1: Drainage Basins and Areas for the City of Florence Local Wetlands Inventory

Drainage Basin	Area (acres)
Airport (AIR)	502.93
Heceta Beach (HB)	176.84
Munsel Creek (MC)	2,357.03
North Fork Siuslaw (NS)	447.91
North Jetty (NJ)	79.35
Old Town (OT)	95.91
Rhododendron (RH)	200.26
Sandpines (SP)	1,539.98
Total Project Acreage	**5,400.21**

Hydrologic Indicators

Direct indicators of hydrology observed during the inventory included saturation of the soil to the surface, inundation, and a shallow water table. Indirect indicators include oxidized rhizospheres with living roots, algal mats, drift lines, and wetland drainage patterns. All water tables observed during the inventory were assumed to be apparent and not perched. In no location was a hardpan observed in the soil.

The inventory field work was originally scheduled to begin during the week of March 25, 1996. However, due to delays in receiving and mapping the locations of properties that could not be accessed, the field work did not begin until May 3 and ended on September 7, 1996. In retrospect this delay was probably fortunate, because it allowed the high water levels observed in the Florence area during the winter and early spring to abate. During the late summer, relatively few of the wetlands still contained standing water. The accuracy of the inventory, therefore, was not affected by the large amount of rain received during the winter and early spring. We were able to observe the high water present in the wetlands in the spring and the relative drought conditions of late summer.

4.4 Soils

Table 2 (page 17) lists the soils that have been mapped by the Natural Resources Conservation Service (formerly the Soil Conservation Service) within the Florence study area. Figure 2 is a copy of pages 83 and 95 from the soil survey (USDA SCS, 1989).

Table 2. Soil units and their Hydric Soils Status for the Florence LWI

Soil Symbol	Soil Name	Hydric Status
18	Brallier variant muck	Hydric
21	Bullards-Ferrelo loams	Non-Hydric
53	Heceta fine sand	Hydric
44	Dunetand Heceta (hydric inclusion) Yaquina (hydric inclusion)	Non-Hydric
94C	Netarts fine sand, 3 to 12 percent slopes Heceta (hydric inclusion) Yaquina (hydric inclusion)	Non-Hydric
94E	Netarts fine sand, 12 to 30 percent slopes Yaquina (hydric inclusion)	Non-Hydric
112G	Preacher-Bohannon-Slickrock complex, 50 to 75 percent slopes	Non-Hydric
131C	Waldport fine sand, 0 to 12 percent slopes Heceta (hydric inclusion) Yaquina (hydric inclusion)	Non-Hydric
131E	Waldport fine sand, 12 to 30 percent slopes Heceta (hydric inclusion) Yaquina (hydric inclusion)	Non-Hydric
133C	Waldport-Urban land complex, 0 to 12 percent slopes Yaquina (hydric inclusion)	Non-Hydric
140	Yaquina loamy fine sand	Hydric
141	Yaquina-urban land complex	Hydric

DATE:

BASE MAP INFO.

JOB NO.

Florence LWI
Soil Series

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, Oregon 97070
Phone: (503) 570-0800
PHS

Fig. 2

Braltier variant muck is a deep, very poorly drained, organic soil found in low tidal basins and on stream floodplains near tidelands. It formed in decomposed fibrous organic residue. Typically, the surface layer is very dark grayish brown muck about 3 inches thick. The substratum to a depth of 60 inches or more is dark brown, highly decomposed and partly decomposed muck.

Bullards-Ferrelo loams, 0 to 7 percent slopes, is a deep and well drained soil found on marine terraces. It consists of 50 percent Bullards loam and 35 percent Ferrelo loam. Bullards soil was formed in sandy alluvial and eolian material, while Ferrelo soil was formed in marine sediment over eolian sand. The surface of both soils is typically covered with a mat of leaves, twigs and needles about 2 inches thick. The surface layer of Bullards is dark grayish brown loam about 4 inches thick. The subsoil is dark reddish brown gravelly loam and strong brown sandy loam about 54 inches thick. The substratum to a depth of 61 inches is strong brown and dark brown loamy fine sand. Ferrelo surface layer is a dark brown loam about 10 inches thick. The subsoil is dark brown and brown loam and silt loam about 37 inches thick. The substratum to a depth of 60 inches or more is brown fine sandy loam over reddish brown, weakly cemented fine sand.

Bullards-Ferrelo loams, 7 to 12 percent slopes, is a deep and well drained soil found on dissected marine terraces. It consists of 50 percent Bullards loam and 35 percent Ferrelo loam. Bullards soil was formed in sandy alluvial and eolian material, while Ferrelo soil was formed in marine sediment over eolian sand. The surface of both soils is typically covered with a mat of leaves, twigs and needles about 2 inches thick. The surface layer of Bullards is dark grayish brown loam about 4 inches thick. The subsoil is dark reddish brown gravelly loam and strong brown sandy loam about 54 inches thick. The substratum to a depth of 61 inches is strong brown and dark brown loamy fine sand. Ferrelo surface layer is a dark brown loam about 10 inches thick. The subsoil is dark brown and brown loam and silt loam about 37 inches thick. The substratum to a depth of 60 inches or more is brown fine sandy loam over reddish brown, weakly cemented fine sand.

Bullards-Ferrelo loams, 12 to 30 percent slopes, is a deep and well drained soil found on deeply dissected marine terraces. It consists of 45 percent Bullards loam and 40 percent Ferrelo loam. Bullards soil was formed in sandy alluvial and eolian material, while Ferrelo soil was formed in marine sediment over eolian sand. The surface of both soils is typically covered with a mat of leaves, twigs and needles about 2 inches thick. The surface layer of Bullards is dark grayish brown loam about 4 inches thick. The subsoil is dark reddish brown gravelly loam and strong brown sandy loam about 54 inches thick. The substratum to a depth of 61 inches is strong brown and dark brown loamy fine sand. Ferrelo surface layer is a dark brown loam about 10 inches thick. The subsoil is dark brown and brown loam and silt loam about 37 inches thick. The substratum to a depth of 60 inches or more is brown fine sandy loam over reddish brown, weakly cemented fine sand.

Bullards-Ferrelo loams, 30 to 60 percent slopes, is a deep and well drained soil found on deeply dissected marine terraces. It consists of 45 percent Bullards loam and 40 percent Ferrelo loam. Bullards soil was formed in sandy alluvial and eolian material, while Ferrelo

soil was formed in marine sediment over eolian sand. The surface of both soils is typically covered with a mat of leaves, twigs and needles about 2 inches thick. The surface layer of Bullards is dark grayish brown loam about 4 inches thick. The subsoil is dark reddish brown gravelly loam and strong brown sandy loam about 54 inches thick. The substratum to a depth of 61 inches is strong brown and dark brown loamy fine sand. Ferrelo surface layer is a dark brown loam about 10 inches thick. The subsoil is dark brown and brown loam and silt loam about 37 inches thick. The substratum to a depth of 60 inches or more is brown fine sandy loam over reddish brown, weakly cemented fine sand.

Heceta fine sand is a deep, poorly drained soil found in depressional areas between dunes. It formed in eolian sand derived dominantly from weathered Tyee Sandstone. The surface layer is typically brown fine sand about 5 inches thick. The substratum to a depth of 60 inches or more is grayish brown, mottled fine sand.

Dune Land is found on large, deep, excessively drained active dunes along the Oregon coast. The areas of Dune land formed in wind-deposited sand. Slopes are gently to steeply undulating and are constantly changing as the dunes shift. Permeability is very rapid. Typically this unit consists of variegated but light gray, fine sand many feet thick..

Netarts fine sand, 3 to 12 percent slopes is a deep, well drained soil on stabilized sand dunes. This soil formed in wind blown sand deposits. Typically the surface is covered with a mat of leaves, needles, and twigs about 2 inches thick. The surface layer is light gray fine sand about 6 inches thick. The subsoil is light gray fine sand about 41 inches thick.

Netarts fine sand, 12 to 30 percent slopes is a deep, well drained soil on stabilized sand dunes. This soil formed in wind blown sand deposits. Typically the surface is covered with a mat of leaves, needles, and twigs about 2 inches thick. The surface layer is light gray fine sand about 6 inches thick. The subsoil is light gray fine sand about 41 inches thick.

Preacher-Bohannon-Slickrock complex, 50 to 75 percent slopes is a deep, well drained soil found on side slopes of upland in the Coast Range. It formed in colluvium and residuum derived from sedimentary rock. It consists of 35 percent Preacher loam, 30 percent Bohannon gravelly loam, and 20 percent Slickrock gravelly loam. The Bohannon soil is mainly on the upper part of downtrending ridges and headwalls, while the Slickrock soil is on small slump benches and toe slopes. The Preacher soil is in the intermediate positions. The surface layer is typically very dark grayish brown and very dark gray loam about 18 inches thick. The subsoil is dark yellowish brown loam about 34 inches thick. The substratum to a depth of 58 inches is dark yellowish brown loam. Weathered bedrock is at a depth of 58 inches. Depth to bedrock ranges from 40 to 60 inches.

Waldport fine sand, 0 to 12 percent slopes is a deep, excessively drained soil on old alluvial terraces. It formed in mixed alluvium. The surface layer is typically very dark grayish brown and dark brown silt loam about 12 inches thick. The subsoil is dark brown silty clay loam about 40 inches thick. The substratum is a silt loam and fine sandy loam.

Waldport fine sand, 12 to 30 percent slopes is a deep, excessively drained soil on old alluvial terraces. It formed in mixed alluvium. The surface layer is typically very dark grayish brown and dark brown silt loam about 12 inches thick. The subsoil is dark brown silty clay loam about 40 inches thick. The substratum is a silt loam and fine sandy loam.

Waldport-Urban land complex, 0 to 12 percent slopes is a deep and excessively drained soil. It formed in eolian sand of mixed origin. It consists of 40 percent relatively undisturbed Waldport fine sand, 10 percent disturbed Waldport fine sand and 40 percent Urban land. The surface is typically covered with a mat of leaves, needles, and twigs about 3 inches thick. The surface layer is very dark gray and very dark grayish brown fine sand about 5 inches thick. The substratum to a depth of 60 inches or more is yellowish brown fine sand.

Yaquina loamy fine sand is a deep somewhat poorly drained soil in low interdunal areas. The surface is typically covered with a mat of needles, twigs, sedges, and grass about 0.5 inches thick. The subsurface layer is light gray fine sand about 6 inches thick. Below this layer is a grayish brown fine sand about 5 inches thick. The subsoil is light brownish gray, mottled fine sand about 16 inches thick.

Yaquina-urban land complex is in low interdunal areas. This unit is 45 percent relatively undisturbed Yaquina loamy fine sand, 5 percent disturbed Yaquina loamy fine sand, and 40 percent urban land. The Yaquina component is a deep somewhat poorly drained soil in low interdunal areas. The surface is typically covered with a mat of needles, twigs, sedges, and grass about 0.5 inches thick. The subsurface layer is light gray fine sand about 6 inches thick. Below this layer is a grayish brown fine sand about 5 inches thick. The subsoil is light brownish gray, mottled fine sand about 16 inches thick.

4.5 Vegetation

4.5.1 Overview

The City of Florence is located within the Sitka Spruce (*Picea sitchensis*) Forest Zone (as characterized by Franklin and Dyrness, 1973). This vegetation zone occupies a low-elevation strip along the immediate coastline, often only a few miles wide, subject to a relatively wet and mild climate. The zone is essentially a variant of the Western Hemlock (*Tsuga heterophylla*) Zone, distinguished largely by the presence of Sitka spruce, frequent summer fogs, and proximity to the ocean. The climate provides nearly ideal growing conditions, accounting for the high productivity of forest stands, as well as prolific growth in shrub and herb-dominated communities.

Common trees found in this region include Sitka spruce, western hemlock, western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga heterophylla*), shore pine (*Pinus contorta*), and red alder (*Alnus rubra*). Sites disturbed through fire or logging may develop into stands of mixed conifers including spruce, hemlock and Douglas fir. However, red alder may overtop the regenerating conifers and develop into a nearly pure alder forest. Dense shrub communities may also form on disturbed sites, often in conjunction with red alder; the dense understory

may delay conifer colonization almost indefinitely. Thicket-forming shrubs common in the region include salmonberry (*Rubus spectabilis*), salal (*Gaultheria shallon*), and evergreen huckleberry (*Vaccinium ovatum*). Further discussion of coastal plant communities within the Sitka Spruce Zone can be found in *Natural Vegetation of Oregon and Washington* (Franklin and Dyrness 1973).

A landform type especially significant to Florence area plant communities consists of the extensive active-to-stabilized dune systems that extend for miles both north and south of the Siuslaw River mouth, as well as several miles inland (see Section 4.1.3 for more discussion of this landform type). The dynamic nature of these systems represents rapidly changing, and oftentimes hostile, growing conditions for plants.

4.5.2 Vegetation Communities

Generalized plant communities encountered within the City of Florence study area include upland active dune complexes, upland broadleaf-scrub/shrub thicket, upland coniferous forest, upland mixed coniferous/deciduous forest, developed-urban, wetland, and riparian/ lacustrine. Wetland communities are further distinguished as freshwater, which includes deflation plains (palustrine unconsolidated bottom, palustrine emergent, palustrine scrub-shrub, and palustrine forested), and brackish (estuarine emergent, and estuarine scrub-shrub) following the Cowardin classification system developed for the US Fish and Wildlife Service (Cowardin et al., 1979). Each of the above communities is described in the sections below. A list of plant species known or suspected to be in the area is included in Table 3, pages 22-27.

Upland Active Dune Complex

The upland dunal systems common in the Florence area are unconsolidated and dynamic, with large volumes of sand continually being brought ashore by wave action. The sand is highly mobile when subject to a sufficiently strong wind. Sand grains may be blown considerable distances unless held in place by surface tension when saturated (as within a deflation plain), protected from wind behind a ridge of accumulated sand, or in contact with stabilizing vegetation. Few plants are able to tolerate partial sand burial, let alone maintain a foothold in this shifting substrate. However, several grasses and forbs may persist for a time and eventually stabilize portions of the active dune. Species most commonly encountered include European beach grass (*Ammophila arenaria*)(widely introduced as a sand-binder), seashore bluegrass (*Poa macrantha*), beach silvertop (*Glehnia leiocarpa*), beach knotweed (*Polygonum paronychia*), American dune-grass (*Elymus mollis*), and beach pea (*Lathyrus japonicus*).

As larger areas of sand surface are protected from further wind action by these plants, other species less tolerant of sand burial are able to become established as well. Seedlings of such trees and shrubs as shore pine, Sitka spruce, Douglas fir, salal, and evergreen huckleberry establish more structured communities that protect ever-larger areas of sand, ultimately leading to the establishment of shrub and forest communities.

Table 3: Plant Species Observed within the Florence Local Wetlands Inventory Study Area

Scientific Name	Common Name	R9-Ind.	Florence	ONHP
	HERBS			
Achillea millefolium	yarrow	FACU	x	
Agrostis alba	redtop	FAC	x	
Agrostis tenuis	colonial bentgrass	FAC	x	
Allotropa virgata	candystick	UPL	x	
Ammophila arenaria	European beachgrass	FACU	x	
Anaphilis margaritacea	pearly everlasting	UPL	x	
Angelica lucida	seawatch angelica	FAC+	x	
Anthoxanthum odoratum	sweet vernal grass	FACU	x	
Arrhenatherum elatius	tall oatgrass	UPL	x	
Aster chilensis	common California aster	FAC	x	
Athyrium filix-femina	subarctic lady fern	FAC	x	
Bellis perennis	English daisy	UPL	x	
Bidens frondosa	devil's beggar tick	FACW+	x	
Blechnum spicant	deer fern	FAC+	x	
Bromus sp.	brome	FACU	x	
Cardionema ramosissima	sandmat	UPL	x	
Carex lenticularis	shore sedge	FACW+	x	
Carex lyngbyei	Lyngby's sedge	OBL	x	
Carex obnupta	slough sedge	OBL	x	
Carex oederi var. viridula	green sedge	FACW-	x	
Carex sitchensis	sitka sedge	OBL	x	
Carex viridula	little green sedge	FACW+	x	
Centaurum umbellatum	centaury	FAC	x	
Chenopodium rubrum	red goosefoot	FACW+	x	
Chrysanthemum leucanthemum	oxeye daisy	UPL	x	
Cirsium arvense	Canada thistle	FACU+	x	
Cirsium vulgare	bull thistle	FACU	x	
Claytonia sibirica	Siberian spring beauty	FAC	x	
Convolvulus arvense	field morning-glory	UPL	x	
Convolvulus sepium	hedge bindweed	UPL	x	
Conyza canadensis	Canada horseweed	FACU	x	
Cuscuta salina	salt-marsh dodder	NI	x	

Table 3 (continued)

Scientific Name	Common Name	R9-Ind.	Florence	ONHP
Cynosurus echinatus	hedgehog dogtail	UPL	x	
Cyperus sp.	flatsedge	FACW	x	
Dactylis glomerata	orchard grass	FACU	x	
Darlingtonia californica	California pitcher-plant	OBL	x	
Daucus carota	Queen Anne's lace	UPL	x	
Deschampsia cespitosa	tufted hairgrass	FACW	x	
Digitalis purpurea	foxglove	FACU	x	
Distichlis spicata	seashore saltgrass	FACW	x	
Drosera rotundifolia	round leaf sundew	OBL	x	
Dryopteris austriaca	mountain woodfern	FAC	x	
Dulichium arundinaceum	dulichium	OBL	x	
Eleocharis ovata	ovate spikerush	OBL	x	
Eleocharis palustris	common spikerush	OBL	x	
Elymus glaucus	blue wild-rye	FACU	x	
Elymus mollis	American dunegrass	UPL	x	
Epilobium angustifolium	fireweed	FACU+	x	
Epilobium watsonii	Watson's willow-herb	FACW-	x	
Equisetum arvense	field horsetail	FAC	x	
Erechtites minima	toothed coast fireweed	UPL	x	
Eriophorum chamissonis	russet cotton-grass	OBL		x
Festuca arundinacea	Kentucky fescue	FAC-	x	
Festuca rubra	red fescue	FAC	x	
Foeniculum vulgare	sweet fennel	FACU	x	
Fragaria chiloensis	coastal strawberry	UPL	x	
Fragaria virginiana	Virginia strawberry	UPL	x	
Galium aparine	catchweed bedstraw	FACU	x	
Glehnia leiocarpa	American glehnia	UPL	x	
Glyceria elata	tall manna grass	FACW+	x	
Gnaphalium sp.	cudweed	FAC	x	
Grindelia integrifolia	Puget Sound gumweed	FACW	x	
Holcus lanatus	common velvet grass	FAC	x	
Hordeum brachyantherum	meadow barley	FACW-	x	
Hydrocotyle ranunculoides	floating pennywort	OBL	x	
Hypericum anagalloides	bog St. John's wort	OBL	x	

Table 3 (continued)

Scientific Name	Common Name	R9-Ind.	Florence	ONHP
Hypericum perforatum	common St. John's wort	UPL	x	
Hypochaeris radicata	hairy cats-ear	UPL	x	
Jaumea carnosa	fleshy jaumea	OBL	x	
Juncus acuminatus	tapered rush	OBL	x	
Juncus articulatus	jointed rush	OBL	x	
Juncus balticus	Baltic rush	FACW+	x	
Juncus bolanderi	Bolander's rush	OBL	x	
Juncus bufonius	toad rush	FACW	x	
Juncus effusus	soft rush	FACW	x	
Juncus ensifolius	three-stamen rush	FACW	x	
Juncus falcatus	sickle leaf rush	FACW-	x	
Juncus lesueurii	salt rush	FACW	x	
Juncus nevadensis	sierra rush	FACW	x	
Juncus supiniformis	spreading rush	OBL	x	
Juncus tenuis	slender rush	FACW-	x	
Lathyrus japonicus	beach pea	FACU-	x	
Leontodon nudicaulis	hairy hawkbit	UPL	x	
Lilaeopsis occidentalis	Western lilaeopsis	OBL	x	
Lolium multiflorum	Italian ryegrass	UPL	x	
Lotus corniculatus	birds-foot trefoil	FAC	x	
Lotus formosissimus	seaside lotus	FACW+	x	
Lupinus arboreus	tree lupine	UPL	x	
Lupinus littoralis	seashore lupine	UPL	x	
Luzula campestris	field woodrush	FACU	x	
Lycopus americanus	American bugleweed	OBL	x	
Lysichitum americanum	yellow skunk-cabbage	OBL	x	
Maianthemum dilatatum	false lily-of-the-valley	FAC	x	
Melilotus alba	white sweet-clover	FACU	x	
Mentha arvensis	field mint	FACW-	x	
Menyanthes trifoliata	buckbean	OBL		x
Nuphar polysepalum	yellow cow-lily	OBL	x	
Oenanthe sarmentosa	water-parsley	OBL	x	
Oenothera hookeri	Hooker's evening-primrose	UPL	x	
Ophioglossum pusillum	adder's tongue	FACW		x

Table 3 (continued)

Scientific Name	Common Name	R9-Ind.	Florence	ONHP
Panicum capillare	witchgrass	FACU+	x	
Petasites frigidus	coltsfoot	FACW	x	
Phalaris arundinacea	reed canary grass	FACW	x	
Plantago lanceolata	English plantain	FAC	x	
Plantago maritima	seaside plantain	FACW+	x	
Poa annua	annual bluegrass	FAC	x	
Poa pratensis	Kentucky bluegrass	FAC	x	
Polygonum aviculare	postrate knotweed	FACW-	x	
Polygonum paronychia	beach knotweed	Nl	x	
Polygonum persicaria	ladysthumb	FACW	x	
Polystichum munitum	sword fern	FACU	x	
Potamogeton natans	floating pondweed	OBL	x	
Potentilla anserina	Pacific silverweed	OBL	x	
Potentilla palustris	purple cinquefoil	OBL	x	
Prunella vulgaris	heal-all	FACU+	x	
Pteridium aquilinum	bracken fern	FACU	x	
Ranunculus flammula	small creeping buttercup	FACW	x	
Ranunculus repens	creeping buttercup	FACW	x	
Rumex acetosella	sour dock	FACU-	x	
Rumex crispus	curly dock	FAC+	x	
Salicornia virginica	pickleweed	OBL	x	
Scirpus acutus	hard-stem bulrush	OBL	x	
Scirpus maritimus	seacoast bulrush	OBL	x	
Scirpus microcarpus	small-fruit bulrush	OBL	x	
Scirpus olneyi	Olney's bulrush	OBL	x	
Scirpus validus	soft-term bulrush	OBL	x	
Sidalcea hendersonii	Henderson's sidalcea	FACW+		x
Sisyrinchium californicum	golden blue-eye grass	FACW+	x	
Smilacina racemosa	feather false-solomon's seal	FAC-	x	
Smilacina stellata	starry false-solomon's seal	FAC-	x	
Sonchus asper	prickly sowthistle	FAC+	x	
Sparganium emersum	simplestem burreed	OBL	x	
Spiranthes romanzoffiana	hooded ladies-tresses	FACW	x	
Stellaria media	common chickweed	FACU	x	

Table 3 (continued)

Scientific Name	Common Name	R9-Ind.	Florence	ONHP
Taraxacum officinale	common dandelion	FACU	x	
Tellima grandiflora	fringecup	UPL	x	
Tolmiea menziesii	piggy-back plant	FAC	x	
Trifolium arvense	hare's foot	UPL	x	
Trifolium pratense	red clover	FACU	x	
Trifolium repens	white clover	FAC	x	
Triglochin maritimum	seaside arrow-grass	OBL	x	
Trillium ovatum	western trillium	NI	x	
Typha latifolia	broad-leaf cattail	OBL	x	
Urtica dioica	stinging nettle	FAC+	x	
Utricularia gibba	humped bladder-wort	OBL	x	x
Veronica americana	American speedwell	OBL	x	
Veronica scutellata	marsh speedwell	OBL	x	
	SHRUBS			
Arctostaphylos columbiana	hairy manzanita	UPL	x	
Arctostaphylos uva-ursi	kinnickinnick	FACU-	x	
Baccharis pilularis	chaparel broom	UPL	x	
Corylus cornuta	beaked hazel-nut	FACU	x	
Cytisus scoparius	Scot's broom	UPL	x	
Gaultheria shallon	salal	FACU	x	
Hedera helix	English ivy	UPL	x	
Ledum glandulosum	Labrador-tea	FACW+	x	
Lonicera involucrata	four-line honeysuckle	FAC	x	
Malus fusca	Pacific crabapple	FACW	x	
Myrica californica	Pacific bayberry	FACW	x	
Oemleria cerasiformis	Indian plum	FACU	x	
Pyrus fusca	western crabapple	FACW	x	
Rhamnus purshiana	cascara buckthorn	FAC-	x	
Rhododendron macrophyllum	Pacific rhododendron	UPL	x	
Rubus discolor	Himalayan blackberry	FACU	x	
Rubus laciniatus	evergreen blackberry	FACU+	x	
Rubus parviflorus	western thimbleberry	FAC-	x	
Rubus spectabilis	salmonberry	FAC+	x	
Rubus ursinus	California blackberry	FACU	x	

Table 3 (continued)

Scientific Name	Common Name	R9-Ind.	Florence	ONHP
Salix hookeriana	hooker willow	FACW-	x	
Salix sitchensis	Sitka willow	FAC	x	
Sambucus racemosa	red elderberry	FACU	x	
Spiraea douglasii	Douglas' spiraea	FACW	x	
Ulex europeus	gorse	UPL	x	
Vaccinium ovatum	evergreen huckleberry	UPL	x	
Vaccinium uliginosum	bog blueberry	FACW+	x	
TREES				
Acer macrophyllum	big leaf maple	FACU	x	
Alnus rubra	red alder	FAC	x	
Picea sitchensis	Sitka spruce	FAC	x	
Pinus contorta	shore pine	FAC	x	
Pseudotsuga menziesii	Douglas Fir	UPL	x	
Salix lasiandra	Pacific willow	FACW-	x	
Thuja plicata	western red cedar	FAC	x	
Tsuga heterophylla	western hemlock	FACU-	x	
MOSSES AND LICHENS				
Bryoria pseudocapillaris	lichen			x
Calypogeia sphagnicola	liverwort			x
Campylopus schmidii	moss			x
Erioderma sorediatum	lichen			x
Leioderma sorediatum	lichen			x
Lycopodiella inundata	northern bog clubmoss			x
Sphagnum sp.	moss		x	
Usnea hesperina	lichen			x

Upland Broadleaf-Scrub/Shrub Thicket

In addition to colonizing recently stabilized sand dunes, shrub communities are often associated with relatively recent disturbance (i.e. following logging, grading, or fire). Dominant species may include saplings of regenerating conifers such as Sitka spruce or Douglas fir, deciduous trees such as red alder, and shrubs such as salmonberry, thimbleberry (*Rubus parviflorus*), salal, evergreen huckleberry, rhododendron (*Rhododendron macrophyllum*), and blackberries (*Rubus* spp.). Introduced Scots' broom (*Cytisus scoparius*) and gorse (*Ulex europaeus*) are also rapid colonizers in disturbed areas. Herbaceous species are common in cleared openings, often being the first plants to colonize disturbed ground.

Upland Coniferous Forest

The dominant species in the coniferous overstory are Douglas fir, Sitka spruce, western hemlock, western red cedar, and shore pine. Sitka spruce and shore pine are more common closer to the ocean (especially within the dune systems) with the other species becoming more dominant inland, further from the effects of salt spray and shifting sands. Understory plants vary greatly with the density of the tree canopy. A closed canopy forest tends to suppress understory species diversity and density, though species such as false lily-of-the-valley (*Maianthemum dilatatum*) and sword fern (*Polystichum munitum*) are commonly encountered. Openings in the canopy allow greater shrub development, with salmonberry, salal, rhododendron, and evergreen huckleberry often evident.

Upland Mixed Coniferous-Deciduous Forest

The conifer species mentioned above may be codominant with deciduous hardwoods such as red alder, bigleaf maple, and willows. Shrub understories are often well-developed given the more open tree overstory for much of the year. Common shrubs include salmonberry, red elderberry (*Sambucus racemosa*), evergreen huckleberry, salal, and Pacific wax myrtle (*Myrica californica*).

Developed-Urban

Plant communities in large portions of the City of Florence study area have been influenced by human activities for most of this century. The study area includes heavily developed commercial areas and single-family residential subdivisions, as well as widely dispersed residential to undisturbed natural areas. Residences, businesses, parking areas, roads, and sidewalks all represent unvegetated or landscaped areas. Vegetation is often of horticultural origin or weedy in these areas. The fringes of these developed areas may have been subject to disturbance as well, often allowed to regenerate as red alder, salmonberry, or blackberry thickets. More frequent disturbance may maintain areas as open spaces dominated by weedy grasses and forbs.

Riparian/Lacustrine

Riparian forests are often similar to the upland mixed evergreen-deciduous forests, though species preferring wetter sites may be more common. Sitka spruce and shore pine may codominate with red alder and western red cedar; Douglas fir and western hemlock may also be present. The shrub layer is often quite dense, especially within a red alder or otherwise more open stand, and may consist of such species as salmonberry, salal, and evergreen huckleberry. Herbaceous species may dominate the understory under a closed evergreen canopy, with lady fern, sword fern, or false lily-of-the-valley often present. Riparian communities are often transitional to or include wetland communities, especially along lake edges.

Lacustrine plant communities vary widely depending on water depths and the degree of stabilization of sideslopes. Many of the lakes in the study area are within interdunal depressions, with active dune movement into the lake edge from one or more directions. Consequently, slopes may be very steep with a short transition from unconsolidated sand into deep water. In these areas the riparian vegetation may be nonexistent or composed only of early successional dune species. In portions of the interdunal depression where wind is blowing sand away from the lake, nearly level sand flats may extend for hundreds of feet, with sufficient water to support a variety of palustrine emergent and scrub/shrub species.

Wetlands

Wetland areas are generally transitional between upland or riparian areas and truly aquatic sites with permanently open water. Open water may or may not be present, in which case the wetland can occupy a position where the groundwater table comes close to the surface for an extended period at some time during the growing season. The Florence study area contains extensive areas of freshwater, or palustrine wetlands, often associated with lake margins within interdunal depressions. In addition, brackish, or estuarine wetlands are present along the tidally influenced banks of the Siuslaw River estuary, as well as along the North Fork Siuslaw River.

The composition of palustrine wetlands in the study area is largely determined by the stability of the dune system surrounding wet depressions. Newly formed deflation plains between unstabilized dunes support primarily emergent species that can survive in soils with minimal organic content. The more stable dunes provide better growing conditions for a variety of species, especially shrubs and trees. More mature palustrine forested wetlands in the area are dominated primarily by an overstory of Sitka spruce, shore pine, and red alder; an herb understory dominated by skunk cabbage (*Lysichitum americanum*) and slough sedge (*Carex obnupta*) is often present as well. At earlier stages of dune stability, palustrine scrub/shrub wetlands often include saplings of the above tree species, along with such shrubs as Hooker's willow (*Salix hookeriana*), bog blueberry (*Vaccinium uliginosum*), Labrador tea (*Ledum glandulosum*), Douglas' spiraea (*Spiraea douglasii*), and four-line honeysuckle (*Lonicera involucrata*). Palustrine emergent wetlands are generally dominated by herbaceous

species such as slough sedge, water parsley *(Oenanthe sarmentosa)*, soft-stem bulrush (*Scirpus validus*), rushes (*Juncus* spp.), and purple cinquefoil (*Potentilla palustris*).

Brackish or estuarine wetlands along the margins of the Siuslaw River and its North Fork are primarily composed of emergent species, although occasional scrub/shrub patches are present at scattered locations as well. These marginal thickets primarily consist of Sitka spruce, Hooker willow, four-line honeysuckle, salmonberry, and occasionally red alder. At lower elevations, the combined influences of high salinity and daily tidal inundation produce pronounced zonation of species composition. Common herbaceous species in the high salt marsh areas include Lyngbye's sedge *(Carex lyngbyei)*, tufted hairgrass (*Deschampsia cespitosa*), Puget Sound gumweed (*Grindelia integrifolia*), Baltic rush (*Juncus balticus*), and seacoast bulrush *(Scirpus maritimus)*. At a somewhat lower elevation, and with a consequent increase in salinity and frequency of inundation, several halophytic species become dominant. These include pickleweed (*Salicornia virginica*), fleshy jaumea (*Jaumea carnosa*), and seashore saltgrass (*Distichlis spicata*).

4.5.3 Wetland and Upland Indicator Species

Species lists of commonly encountered plants, along with their status as indicators of wetland conditions, have been prepared for all regions of the country by the USFWS (1988). The status of a particular plant, as discussed in Section 2.0 is the probability of that plant occurring in a wetland. Many plants, however, are found in transitional areas between wetlands and uplands. These areas are usually characterized by flat to gradually sloping terrain where the species composition may not reflect true wetland boundaries. In such areas, a species with a status of FACU may extend into the wetland areas, just as FACW species may be present in upland areas.

A non-comprehensive listing of species encountered within the project area, along with their wetland indicator status is included in Table 3. If the species appeared on the Oregon Natural Heritage Program database this is indicated in a separate column.

4.6 Uncommon Wetland Plant Communities

Within the broad wetland community types listed above, several uncommon plant assemblages can be found within the Florence study area. The Oregon Natural Heritage Program (ONHP) maintains a statewide database that tracks not only the status of individual plant and animal species, but increasingly rare plant communities as well (ONHP, 1993). Through linkages with Natural Heritage Program databases from other regions, certain plant communities have been assessed to have global as well as statewide significance; i.e. critically imperiled globally (G1; typically 5 or fewer occurrences), imperiled globally (G2; typically 6 to 20 occurrences), or uncommon but not imperiled (G3; typically 21 to 100 occurrences). Similar designations are given for statewide occurrences (S1, S2, S3). Each assemblage is becoming increasingly scarce for a variety of reasons, which may include competition from invasive plants, motorized recreation, residential development and logging.

Communities that have a relatively high priority for conservation efforts and that were encountered during the field study include three palustrine scrub–shrub assemblages and one palustrine forested assemblage. These are the *Ledum/Sphagnum* bog association, the *Ledum/Sphagnum/Darlingtonia* association, the *Vaccinium uliginosum/Deschampsia* association, and the *Pinus contorta/Carex obnupta* association.

The Labrador-tea/Sphagnum (*Ledum glandulosum/Sphagnum* spp.) bog association (G2S2) on organic soils was encountered at several locations (SP-9, SP-12, MC-3A, NS-4, and NS-6). However, this community in association with the carnivorous California pitcher plant (*Darlingtonia californica*)(also G2S2) was observed in only two location (NS-4 and NS-6). Both assemblages were associated with shore pine as well, except in the NS-4 wetland. A second insectivorous plant adapted to acid-bog conditions, the round-leaf sundew (*Drosera rotundifolia*), was also observed in NS-4 and NS-6.

The third scrub/shrub association, the coastal bog blueberry/tufted hairgrass (*Vaccinium uliginosum/ Deschampsia cespitosa*) brush prairie (G2S2), was observed in only a few instances, though both species were fairly widespread otherwise. Wetlands SP-12, SP-23C, SP-30A, SP-34, SP-39A, SP-40, SP-41, MC-3A, MC-14, MC-15, MC-16, MC-25, MC-30 each included this association. The presence of an iron-cemented hardpan contributing to a seasonally perched water table was not confirmed for each location.

A palustrine forested association possibly present in the study area was the shore pine/slough sedge (*Pinus contorta/Carex obnupta*) (G2S1) vernal pool community, formed on an iron-cemented hardpan. Although both plant species are common in the Florence area, the presence of this particular plant association in combination with the cemented hardpan was not documented in the field. Table 4 lists the wetlands with uncommon wetland communities and the type of community.

Table 4: Wetlands Observed with Uncommon Wetland Plant Communities in the Florence LWI Study Area

Wetland Code	Uncommon Plant Community		
	Ledum/Sphagnum	***Ledum/Sphagnum/ Darlingtonia***	***Vaccinium/Deschampsia***
SP-9	X		
SP-12	X		X
SP-23A,B	X		
SP-23C			X
SP-30A			X
SP-34			X
SP-39A			X
SP-40			X
SP-41			X
NS-4	X	X	
NS-6	X		

Table 4: Continued

Wetland Code	Uncommon Plant Community		
	Ledum/Sphagnum	*Ledum/Sphagnum/ Darlingtonia*	*Vaccinium/Deschampsia*
MC-3A	X		X
MC-14			X
MC-15			X
MC-16			X
MC-25			X
MC-30			X

4.7. Rare, Threatened, and Endangered Species

As previously stated in Section 4.6, the Oregon Natural Heritage Program maintains a statewide database for individual plant and animal species as well as plant communities (ONHP, 1995). The sensitivity of species to various influences, regardless of origin, is monitored through many sources, including public agencies, academic institutions, and private groups. Trends are reevaluated periodically to assess whether an individual species warrants legal protection under the federal and state Endangered Species Acts.

Sensitive plants

The ONHP provided a database-derived list of plants known or expected to occur within a two mile radius of the Florence study area. Of the twelve plant species provided, none were listed or candidates for listing as threatened or endangered. Instead, each was on ONHP's List 2, which contains species that are possibly threatened, endangered, or extirpated from Oregon, but are more common or stable elsewhere. Four of the species are lichens, two are liverworts, one is a moss, and the remaining five are vascular plants. A listing of these species is included in Table 5 (page 33).

Sensitive animals

The ONHP database printout referenced above included five animal species as well. These include several state and/or federally listed sensitive species. Both the bald eagle (*Haliaeetus leucocephalus*) and western snowy plover *(Charadrius alexandrinus nivosus*) are listed as threatened under both the federal and state Endangered Species Acts. The purple martin (*Progne subis*) is listed as critical, and the American marten (*Martes americana*) as vulnerable, by the State of Oregon. The common loon *(Gavia immer*) is included on ONHP's List 2 (see Table 5).

Determining the presence or absence of these species (or of their habitat) within the Florence study area was not within the scope of this inventory.

Table 5: Oregon Natural Heritage Program Listing of Rare, Threatened, or Endangered Species in the Florence Area

ANIMALS

NAME	Federal Listing	State Listing	ONHP
Western Snowy Plover *(Charadrius alexandrinus nivosus)*	LT	LT	
Common Loon *(Gavia immer)*			List 2
Bald Eagle *(Haliaeetus leucocephalus)*	LT	LT	
Purple Martin *(Progne subis)*		SC	
American Marten *(Martes americana)*		SV	

PLANTS

Lichen *(Bryoria pseudocapillaris)*			List 2
Liverwort *(Calypogeia sphagnicola)*			List 2
Moss *(Campylopus schmidii)*			List 2
Lichen *(Erioderma sorediatum)*			List 2
Lichen *(Leioderma sorediatum)*			List 2
Liverwort *(Lophozia laxa)*			List 2
Lichen *(Usnea hesperina)*			List 2
Russet cotton-grass *(Eriophorum chamissonis)*			List 2
Northern bog clubmoss *(Lycopodiella inundata)*			List 2
Adder's-Tongue *(Ophioglossum pusillum)*			List 2
Henderson sidalcea *(Sidalcea hendersonii)*			List 2
Humped bladder-wort *(Utricularia gibba)*			List 2

LT – Listed Threatened SC – Sensitive critical SV – Sensitive vulnerable

List 2 = Species which are threatened, endangered, or possibly extirpated from Oregon, but are more common or stable elsewhere

4.8 Wildlife

The Florence area provides valuable habitat for a variety of wildlife species due to the range of vegetation, proximity to both the Pacific Ocean and the Coast Range, the availability of freshwater lakes and several perennial streams, and the relative extent of undisturbed areas within the city limits. Large animals include black bear *(Ursus americanus)*, black-tailed deer *(Odocoileus hemionus columbianus)*, and mountain lion *(Felis concolor)*, as well as many other smaller mammals such as river otter *(Lutra canadensis)*, beaver *(Castor canadensis)*, raccoon *(Procyon lotor)* and bobcat *(Lynx rufus)*. Osprey *(Pandion haliaetus)* nest in many locations along the Siuslaw River and salmonids are present in Munsel Creek and Munsel Lake.

A list of wildlife species likely to inhabit the area is included as Table 6 (pages 35-41)(Pers. com., Cottam, 1996).

5.0 LWI DISCUSSION AND CONCLUSIONS

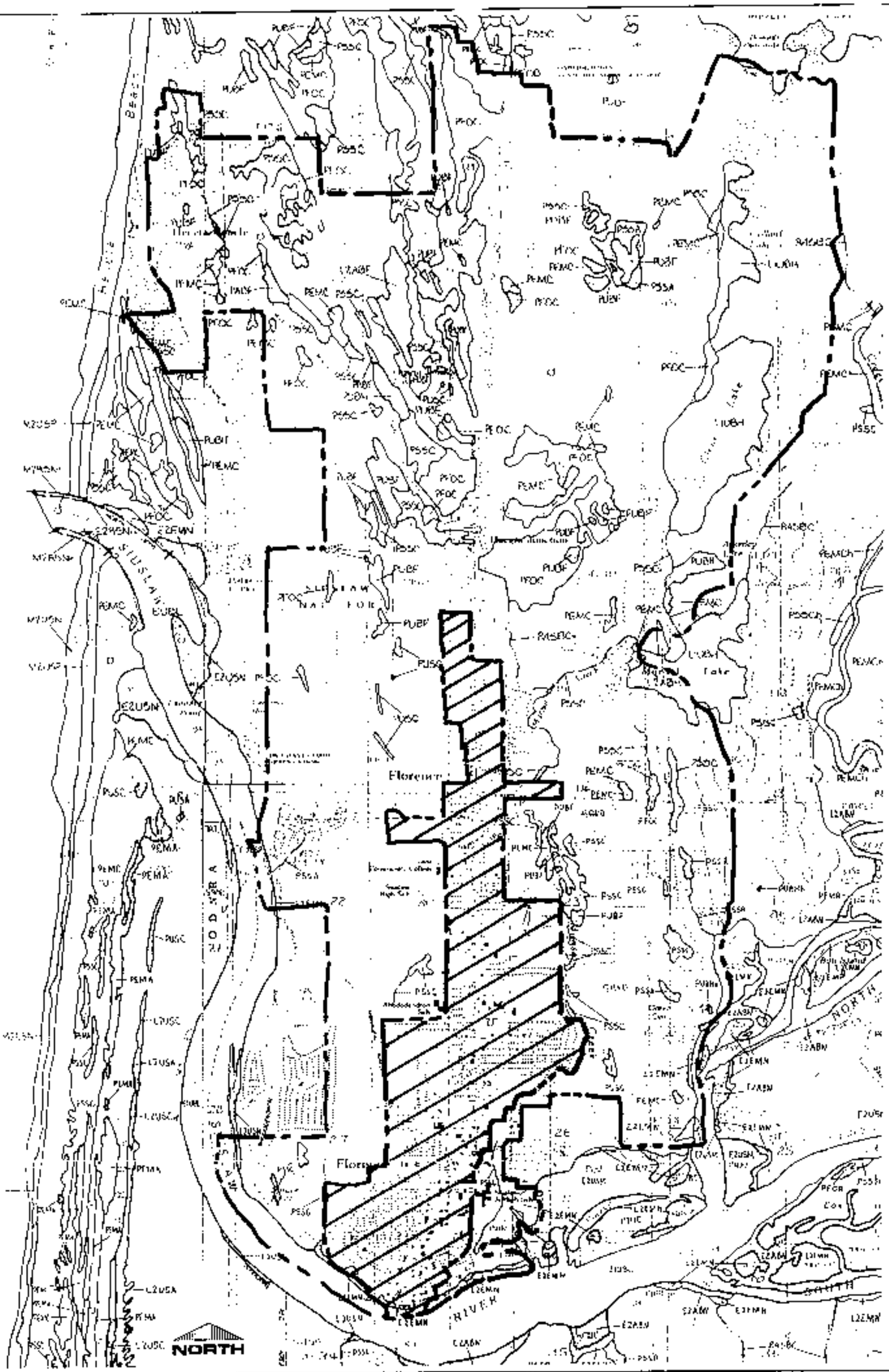
5.1 U.S. Fish & Wildlife Service National Wetland Inventory Areas

The U.S. Fish and Wildlife Service, as part of the National Wetland Inventory (NWI) program, has mapped wetland in the study area (Figure 3). The NWI maps are generated primarily on the basis of interpretation of relatively small-scale color infrared aerial photographs (e.g., scale of 1:58,000) with limited "ground truthing" conducted to confirm the interpretations.

The NWI maps were useful in the Florence area due to the heavy brush and the lack of project area access. Almost all of the wetlands mapped through the NWI were found during the LWI. In addition, numerous additional wetlands were also mapped as part of the LWI.

The two most notable wetland areas not found during the LWI, but mapped through the NWI was a palustrine scrub-shrub wetland in the southwest corner of the study area, north of Rhododendron Drive. This area was walked by PHS staff and data collected (sample site 56) to document site conditions. No wetland was found in this area.

The other wetland area mapped through the NWI is a palustrine scrub-shrub wetland mapped north of a running track at the Rhododendron School. This area was also walked by PHS staff to inventory the presence of wetland. However, the area is dominated by salal, rhododendron, shore pine, and evergreen huckleberry and contains no wetland. Data point AIR-1A-46 documents site conditions.



DATE:
BASE MAP INFO:
JOB NO.:

Florence LWI
National Wetlands Inventory

Pacific Habitat Services, Inc.
Suite 24 Commerce Circle, Suite 104
Wilsonville, Oregon 97070
Phone (503) 570-0800

PHS

Fig. 3

Table 6: Wildlife Species within the Florence Study Area

Scientific Name	Common Name
BIRDS	
Accipiter cooperii	Cooper's Hawk
Accipiter gentilis	Northern Goshawk
Accipiter striatus	Sharp-shinned Hawk
Aechmophorus clarkii	Clark's Grebe
Aechmophorus occidentalis	Western Grebe
Aegolius acadicus	Saw-whet Owl
Agelaius phoeniceus	Red-winged Blackbird
Aix sponsa	Wood Duck
Anas acuta	Northern Pintail
Anas americana	American Wigeon
Anas crecca	Green-winged Teal
Anas clypeata	Northern Shoveler
Anas cyanoptera	Cinnamon Teal
Anas penelope	Eurasian Wigeon
Anas platyrhynchos	Mallard
Anas strepera	Gadwall
Anthus rubescens	American Pipit
Aphelocoma coerulescens	Scrub Jay
Ardea herodias	Great Blue Heron
Arenaria melanocephala	Black Turnstone
Aythya affinis	Lesser Scaup
Aythya americana	Redhead
Aythya collaris	Ring-necked duck
Aythya marila	Greater Scaup
Aythya valisineria	Canvasback
Bombycilla cedrorum	Cedar Waxwing
Bonasa umbellus	Ruffed Grouse
Botaurus lentiginosus	American Bittern
Brachyramphus marmoratus	Marbled Murrelet
Branta bernicla	Brant
Branta canadensis	Canada Goose
Bubo virginianus	Great Horned Owl
Bubulcus ibis	Cattle Egret
Bucephala albeola	Bufflehead
Bucephala clangula	Common Goldeneye
Bucephala islandica	Barrow's Goldeneye
Buteo jamaicensis	Red-tailed Hawk
Buteo lagopus	Rough-legged Hawk
Butorides striatus	Green-backed Heron

Table 6: Continued

Scientific Name	Common Name
Calidris alba	Sanderling
Calidris alpina	Dunlin
Calidris mauri	Western Sandpiper
Calidris minutilla	Least Sandpiper
Calypte anna	Anna's Hummingbird
Carduelis pinus	Pine Siskin
Carduelis tristis	American Goldfinch
Carpodacus mexicanus	House Finch
Carpodacus purpureus	Purple Finch
Casmerodius albus	Great Egret
Cathartes aura	Turkey Vulture
Catharus guttatus	Hermit Thrush
Catharus ustulatus	Swainson's Thrush
Catoptrophorus semipalmatus	Willet
Cepphus columba	Pigeon Guillemot
Cerorhinca monocerata	Rhinoceros Auklet
Certhia americana	Brown Creeper
Ceryle alcyon	Belted Kingfisher
Charadrius alexandrinus nivosus	Western Snowy Plover
Charadrius semipalmatus	Semipalmated Plover
Charadrius vociferus	Killdeer
Chaetura vauxi	Vaux's Swift
Cinclus mexicanus	American Dipper
Circus cyaneus	Northern Harrier
Cistothorus palustris	Marsh Wren
Clangula hyemalis	Oldsquaw
Coccothraustes vespertinus	Evening Grosbeak
Colaptes auratus	Red-shafted Flicker
Columba fasciata	Band Tailed Pigeon
Columba livia	Rock Dove
Contopus borealis	Olive-sided Flycatcher
Contopus sordidulus	Western Wood-Pewee
Corvus corax	Raven
Corvus brachyrhynchos	American Crow
Cyanocitta stelleri	Stellar's Jay
Cygnus columbianus	Tundra Swan
Dendragapus obscurus	Blue Grouse
Dendroica coronata	Yellow-rumped Warbler
Dendroica nigrescens	Black-throated Gray Warbler
Dendroica occidentalis	Hermit Warbler

Table 6: Continued

Scientific Name	Common Name
Dendroica petechia	Yellow Warbler
Dendroica townsendi	Townsend's Warbler
Dendroica virens	Black-throated Green Warbler
Dryocopus pileatus	Pileated Woodpecker
Elanus caeruleus	Black-shouldered Kite
Empidonax difficilis	Pacific-slope Flycatcher
Empidonax traillii	Willow Flycatcher
Euphagus cyanocephalus	Brewer's Blackbird
Falco columbarius	Merlin
Falco peregrinus	Peregrine Falcon
Falco sparverius	Sparrow Hawk/American Kestrel
Fulica americana	American Coot
Fulmarus glacialis	Northern Fulmar
Gavia immer	Common Loon
Gavia pacifica	Pacific Loon
Gavia stellata	Red-throated Loon
Geothlypis trichas	Common Yellowthroat
Glaucidium gnoma	Northern Pygmy Owl
Haliaeetus leucocephalus	Bald Eagle
Haematopus bachmani	Black Oystercatcher
Hirundo rustica	Barn Swallow
Histrionicus histrionicus	Harlequin Duck
Icterus galbula	Northern Oriole
Ixoreus naevius	Varied Thrush
Junco hyemalis	Oregon Junco
Lanius excubitor	Northern Shrike
Larus argentatus	Herring Gull
Larus californicus	California Gull
Larus canus	Mew Gull
Larus delawarensis	Ring-billed Gull
Larus glaucescens	Glaucous-winged Gull
Larus hyperboreus	Glaucous Gull
Larus occidentalis	Western Gull
Larus philadelphia	Bonparte's Gull
Larus thayeri	Thayer's Gull
Limnodramus scolopaceus	Long-billed Dowitcher
Lophodytes cucullatus	Hooded Merganser
Melanitta perspicillata	Surf Scoter
Melospiza melodia	Song Sparrow
Mergus merganser	Common Merganser

Table 6: Continued

Scientific Name	Common Name
Melanitta fusca	White-winged Scoter
Melanitta nigra	Black Scoter
Mergus serrator	Red-breasted Merganser
Molothrus ater	Brown-headed Cowbird
Myadestes townsendi	Townsend's Solitaire
Numenius americanus	Long-billed Curlew
Numenius phaeopus	Whimbrel
Nycticorax nycticorax	Black-crowned Night Heron
Oporonis tolmiei	Macgillivray's Warbler
Oreortyx pictus	Mountain Quail
Otus kennicottii	Western Screech-Owl
Pandion haliaetus	Osprey
Parus atricapillus	Black-capped Chickadee
Parus rufescens	Chestnut-backed Chickadee
Passer domesticus	House Sparrow
Passerculus sandwichensis	Savannah Sparrow
Passerella iliaca	Fox Sparrow
Pelecanus occidentalis	Brown Pelican
Perisoreus canadensis	Gray Jay
Phalacrocorax auritus	Double-crested Cormorant
Phalacrocorax pelagicus	Pelagic Cormorant
Phalacrocorax penicillatus	Brandt's Cormorant
Phalaropus tricolor	Wilson's Phalarope
Pheucticus melanocephalus	Black-Headed Grosbeak
Picoides pubescens	Downy Woodpecker
Picoides villosus	Hairy Woodpecker
Piranga ludoviciana	Western Tanager
Pipilo erythrophthalmus	Rufus-sided Towhee
Podiceps auritus	Horned Grebe
Podiceps grisegena	Red-necked Grebe
Podiceps nigricollis	Eared Grebe
Podilymbus podiceps	Pied-billed Grebe
Porzana carolina	Sora
Progne subis	Purple Martin
Psaltriparus minimus	Bushtit
Ptychoramphus aleuticus	Cassin's Auklet
Puffinus griseus	Sooty Shearwater
Rallus limicola	Virginia Rail
Regulus calendula	Ruby-crowned Kinglet
Regulus satrapa	Golden-crowned Kinglet

Table 6: Continued

Scientific Name	Common Name
Riparia riparia	Bank Swallow
Rissa tridactyla	Black-Legged Kittiwake
Selasphorus rufus	Rufous Hummingbird
Sialia mexicana	Western Bluebird
Sitta canadensis	Red-breasted Nuthatch
Sitta carolinensis	White-breasted Nuthatch
Sphyrapicus ruber	Red-breasted Sapsucker
Sphyrapicus varius	Yellow-bellied Sapsucker
Spizella passerina	Chipping Sparrow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Sterna caspia	Caspian Tern
Sturnella neglecta	Western Meadowlark
Sturnus vulgaris	European Starling
Tachycineta bicolor	Tree Swallow
Tachycineta thalassina	Violet-green Swallow
Tringa melanoleuca	Greater Yellowlegs
Thryomanes bewickii	Bewick's Wren
Troglodytes troglodytes	Winter Wren
Troglodytes aedon	House Wren
Turdus migratorius	Robin
Tyto alba	Barn Owl
Uria aalge	Common Murre
Vermivora celata	Orange-crowned Warbler
Vermivora ruficapilla	Nashville Warbler
Vireo gilvus	Warbling Vireo
Vireo huttoni	Hutton's Vireo
Vireo solitarius	Solitary Vireo
Wilsonia pusilla	Wilson's Warbler
Zenaida macroura	Mourning Dove
Zonotrichia atricapilla	Golden-crowned Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
MAMMALS	
Canis latrans	Coyote
Castor canadensis	Beaver
Cervus elaphus	Elk
Eptesicus fuscus	Big Brown Bat
Felis concolor	Mountain Lion/Cougar
Glaucomys sabrinus	Northern Flying Squirrel
Lasionycteris noctivagans	Silver Haired Bat
Lasiurus cinereus	Hoary Bat

Table 6: Continued

Scientific Name	Common Name
Lutra canadensis	River Otter
Lynx rufus	Bobcat
Martes americana	Marten
Mephitis mephitis	Striped Skunk
Microtus oregoni	Creeping Vole
Microtus longicaudus	Long-tailed Vole
Mustela erminea	Ermine
Mustela frenata	Long-tailed Weasel
Mustela vison	Mink
Myotis californicus	California Myotis
Myotis evotis	Long-eared Myotis
Myotis lucifugus	Little Brown Bat
Myotis thysanodes	Fringes Myotis
Myotis volans	Long-legged myotis
Myotis yumanensis	Yuma Myotis
Neotoma cinerea	Bushytail Woodrat
Neurotrichus gibbsii	Shrew Mole
Odocoileus hemionus columbianus	Black-tailed Deer
Ondatra zibethicus	Muskrat
Peromyscus maniculatus	Deer Mouse
Plecotus townsendii	Townsend's Big-eared Bat
Procyon lotor	Raccon
Rattus rattus	Black Rat
Scapanus orarius	Coast Mole
Scapanus townsendii	Townsend's Mole
Sorex bendirii	Pacific Water Shrew
Sorex obscurus	Dusky Shrew
Sorex vagrans	Vagrant Shrew
Spermophilus beecheyi	California Ground Squirrel
Sylvilagus bachmani	Brush Rabbit
Tamias townsendii	Townsend's Chipmunk
Tamiasciurus douglasii	Douglas Squirrel
Thomomys mazama	Western Pocket Gopher
Ursus americanus	Black Bear
Zapus trinotatus	Pacific Jumping Mouse

Table 6: Continued

Scientific Name	Common Name
FISH	
Acipenseridae Family	Sturgeon
Catostomus spp	Sucker
Cottus spp.	Sculpin
Dorosoma spp.	Shad
Gasterosteus aculeatus	Three-Spine Stickleback
Ictalurus nebulosus	Brown Bullhead
Ictalurus punctatus	Channel Catfish
Lampetra tridentata	Pacific Lamprey
Lepomis macrochirus	Bluegill
Micropterus salmoides	Largemouth Bass
Morone saxatilis	Striped Bass
Oncorhynchus kisutch	Coho Salmon
Oncorhynchus mykiss	Rainbow Trout
Oncorhynchus mykiss	Steelhead
Oncorhynchus nerka	Kokanee
Osmeridae Family	Smelt
Perca flavescens	Yellow Perch
Platichthys stellatus	Starry Flounder
Pomoxis annularis	White Crappie
Pomoxis nigromaculatus	Black Crappie
Ptychocheilus oregonensis	Squawfish
Richardsonius balteatus	Redside Shiner
Salmo clarki	Cutthroat Trout
REPTILES AND AMPHIBIANS	
Ambystoma gracile	Northwestern Salamander
Ascaphus truei	Tailed Frog
Dicamptodon tenebrosus	Pacific Giant Salamander
Elgaria coerulea	Northern Alligator Lizard
Ensatina eschscholtzii	Ensatina
Hyla regilla	Pacific Treefrog
Rana aurora	Redlegged Frog
Rana catesbeiana	Bullfrog
Rhyacotriton variegatus	Southern Torrent Salamander
Sceloporus occidentalis	Western Fence Lizard
Taricha granulosa	Roughskin Newt
Thamnophis ordinoides	Northwestern Garter Snake
Thamnophis sirtalis	Common Garter Snake

5.2 Local Wetlands Inventory Results

5.2.1 Wetland Acreage and Distribution

The study area is approximately 5,400 acres in size. In this area, 270 wetlands, totaling 572.25 acres, were found by the LWI, not including the open water areas of Clear Lake, Collard Lake, Ackerley Lake, and Munsel Lake (Figures 4A-4F). The average size of the wetlands is 2.12 acres. The largest wetland is SP-7A at 33.17 acres. This wetland is classified as a lacustrine aquatic bed. An active sand dune forms the northern edge of the wetland. The smallest wetland is NS-5 at 0.04 acres. This small wetland is a channel flowing south into the North Fork Siuslaw River with a forested overstory. Table 7 shows the wetland areas by drainage basin.

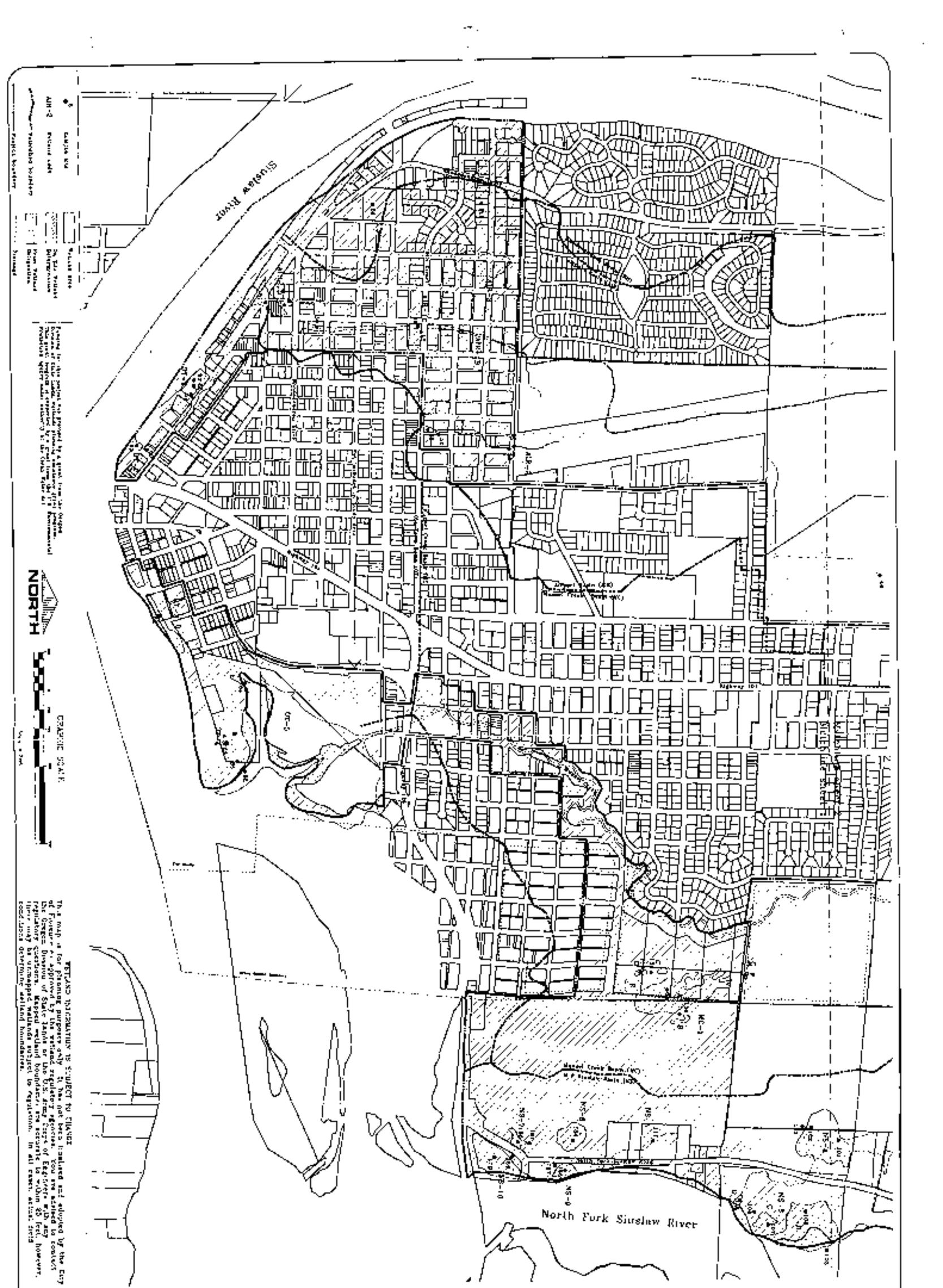
Table 7: Wetland Areas Within Each of the Drainage Basins for the Florence Local Wetlands Inventory

Drainage Basin	Area (acres)	Wetland (acres)	Percent of basin that is wetland
Airport	502.93	7.22	1.4
Heceta Beach	176.84	19.07	10.8
Munsel Creek	2357.03	192.18	8.2
North Fork Siuslaw	447.91	56.01	12.5
North Jetty	79.35	0.53	0.7
Old Town	95.91	34.69	36.0
Rhododendron	200.26	3.39	1.7
Sandpines	1539.98	259.16	16.8
Total Project Acreage	**5400.21**	**572.25**	

5.2.2 Wetland Classification

The majority of the 572 acres of wetlands within the Florence study area are palustrine forested (30%), followed by palustrine scrub-shrub (26%). Large forested wetlands exist north of the City center and are usually dominated by an overstory of shorepine. These wetlands are often associated with areas of unconsolidated bottom (15%) or emergent wetland (14%), both of which are usually inundated at least seasonally. Areas of estuarine emergent and scrub-shrub wetland are located along the Siuslaw and North Fork Siuslaw Rivers and often extend outside the project boundary.

Table 8 (pages 43-46) summarizes the wetland classification areas found within the LWI study area of Florence. Off-site classifications were based on the review of aerial photographs and the NWI classifications.



Florence
Local Wetlands Inventory

Fig. 4A

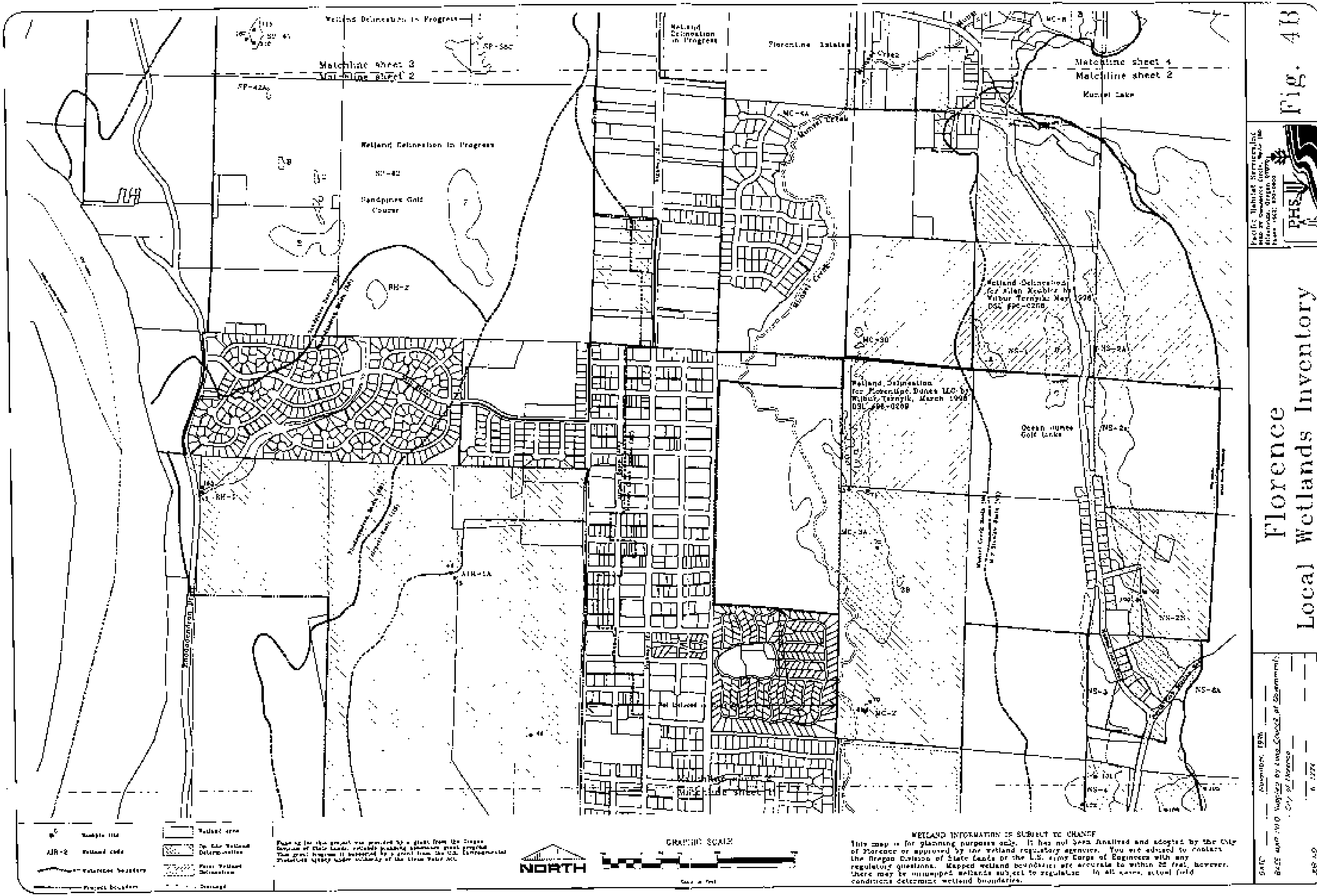
DATE: November, 1995

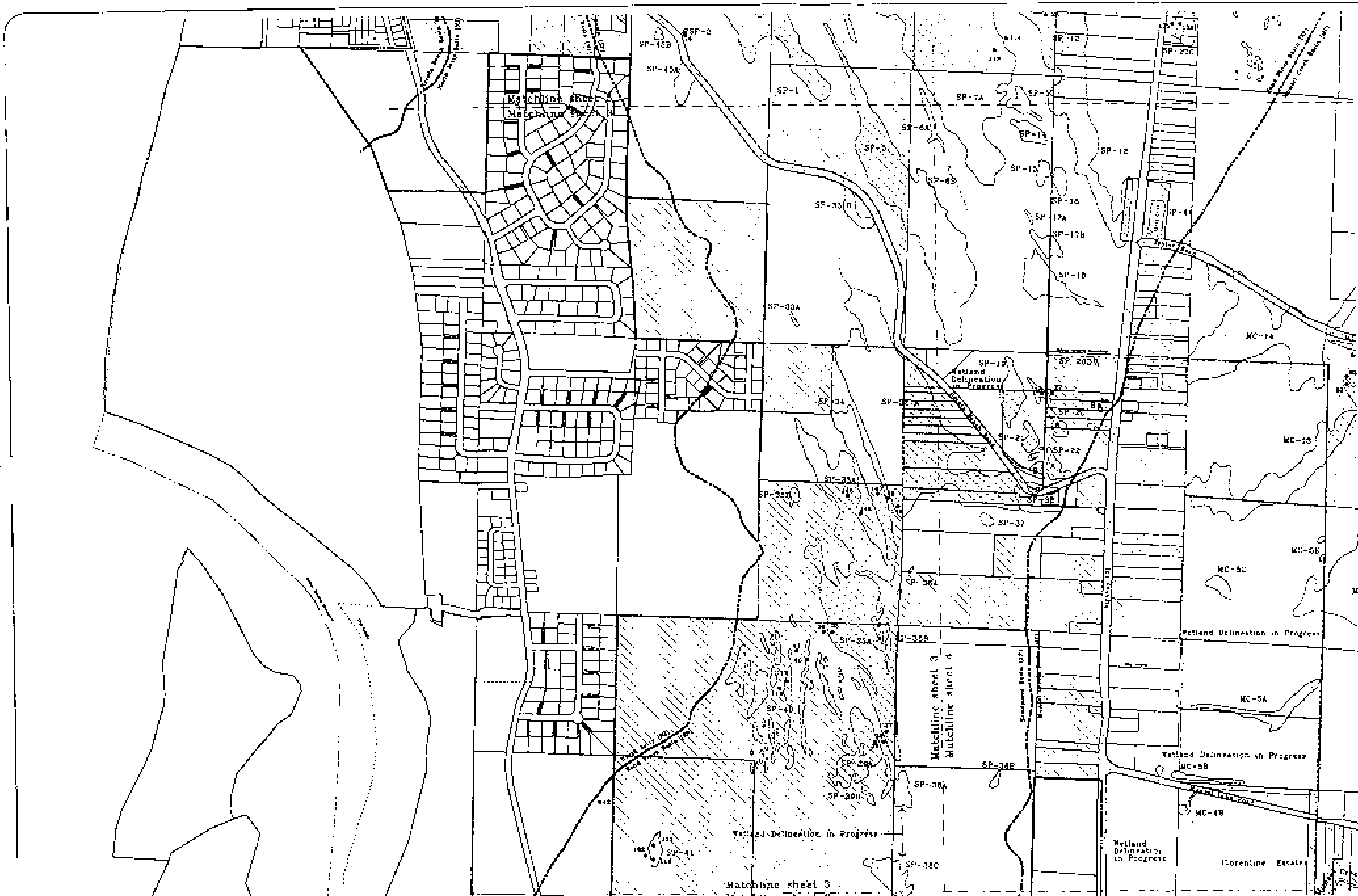
BASE MAP INFO: Supplied by Lane Council of Governments, City of Florence

JOB NO: 6-1224

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, Oregon 97070
Phone: (503) 570-0800
FAX: (503) 570-0855

PHS


Florence
Local Wetlands Inventory
Fig. 4B
Pacific Habitat Services, Inc.
PHS
Matchline sheet 3
Matchline sheet 2
Matchline sheet 4
Matchline sheet 2
Wetland Delineation in Progress
Florentine Estates
Munsel Lake
Munsel Creek
Sandpines Golf Course
Ocean Dunes Golf Links
MC-3A
MC-3B
MC-2
MC-5A
NS-2A
NS-4
NS-6A
NS-3
AIR-1A
RH-2
SP-4B
SP-5C
SP-42A
Wetland Delineation for Allen Koehler by Wilbur Ternyik; May 1996 DSL #96-0208
Wetland Delineation for Florentine Dunes LLC by Wilbur Ternyik, March 1996 DSL #96-0209
Matchline sheet 1
Sample Plot
AIR-2 Wetland code
Watershed boundary
Project boundary
Wetland area
On-Site Wetland Determination
Prior Wetland Delineation
Drainage
NORTH
GRAPHIC SCALE
WETLAND INFORMATION IS SUBJECT TO CHANGE
This map is for planning purposes only. It has not been finalized and adopted by the City of Florence or approved by the wetland regulatory agencies. You are advised to contact the Oregon Division of State Lands or the U.S. Army Corps of Engineers with any regulatory questions. Mapped wetland boundaries are accurate to within 25 feet, however, there may be unmapped wetlands subject to regulation. In all cases, actual field conditions determine wetland boundaries.



Project boundary
Drainage

NORTH

GRAPHIC SCALE

WETLAND INFORMATION IS SUBJECT TO CHANGE

This map is for planning purposes only. It has not been finalized and adopted by the City of Florence or approved by the wetland regulatory agencies. You are advised to contact the Oregon Division of State Lands or the U.S. Army Corps of Engineers with any regulatory questions. Mapped wetland boundaries are accurate to within 25 feet, however, there may be unmapped wetlands subject to regulation. In all cases actual field conditions determine wetland boundaries.

Florence Local Wetlands Inventory

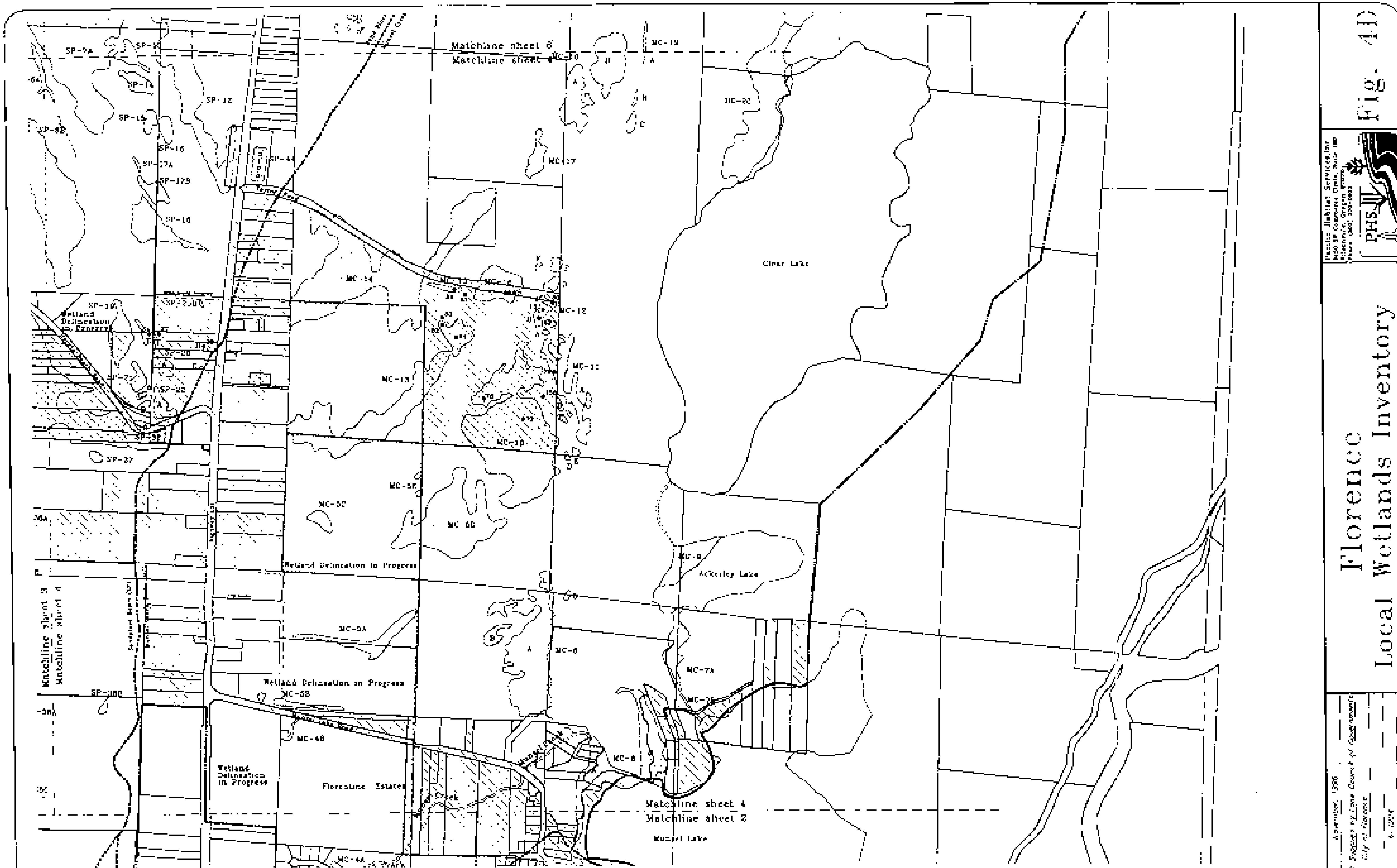
Pacific Habitat Services, Inc.

PHS

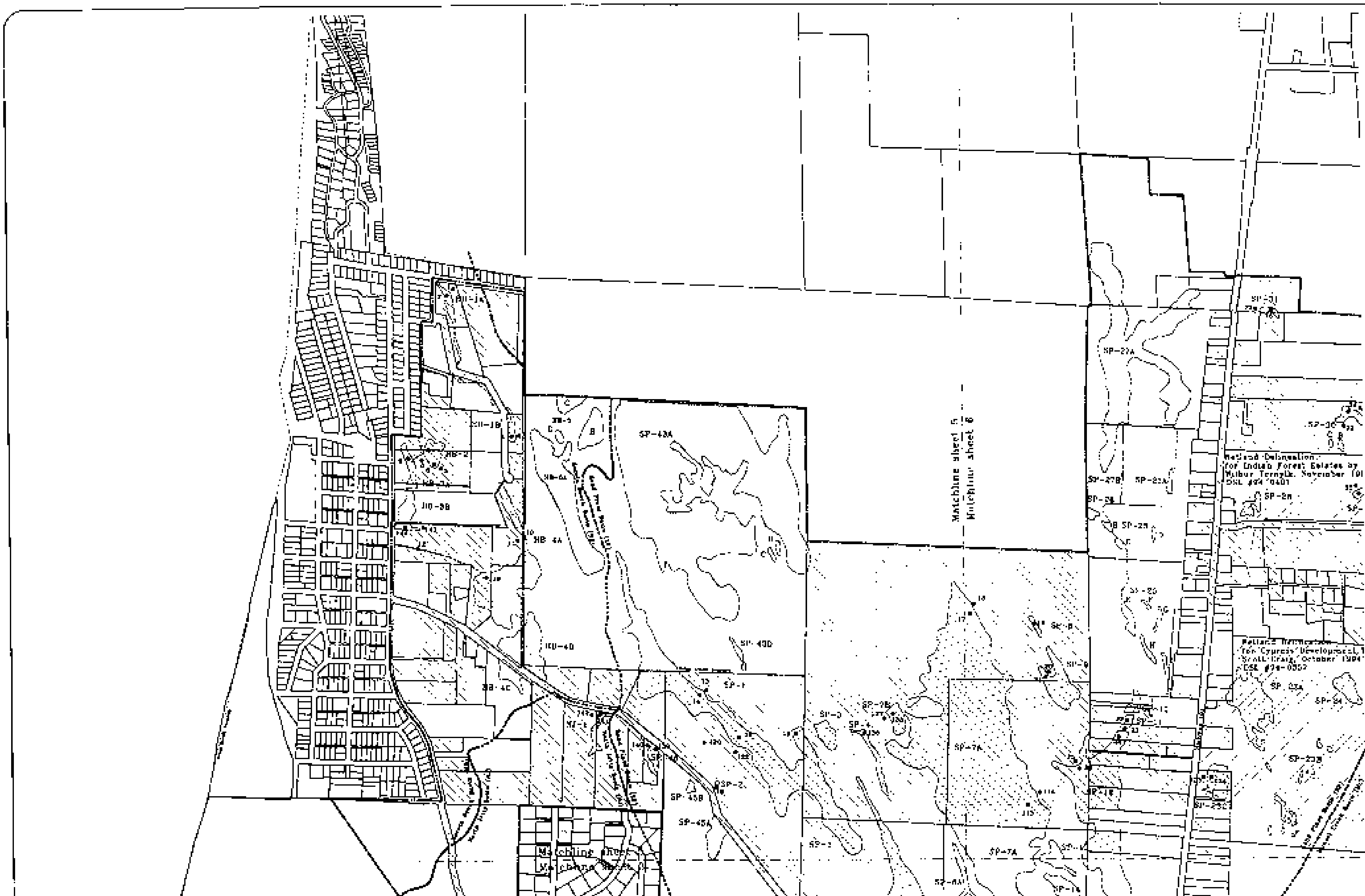
DATE: November, 1995

City of Florence

Fig. 4C



WETLAND INFORMATION IS SUBJECT TO CHANGE
This map is for planning purposes only. It has not been finalized and adopted by the City of Florence or approved by the wetland regulatory agencies. You are advised to contact the Oregon Division of State Lands or the U.S. Army Corps of Engineers with any regulatory questions. Mapped wetland boundaries are accurate to within 25 feet, however there may be unmapped wetlands subject to regulation. In all cases, actual field conditions determine wetland boundaries.



Sample site
Wetland code
Extended boundary
Project boundary
Wetland area
On Site Wetland Determination
Prior Wetland Delineation
Drainage

Funding for this project was provided by a grant from the Oregon Division of State Lands wetlands planning assistance grant program. This grant program is supported by a grant from the U.S. Environmental Protection Agency under authority of the Clean Water Act.

NORTH

GRAPHIC SCALE

WETLAND INFORMATION IS SUBJECT TO CHANGE

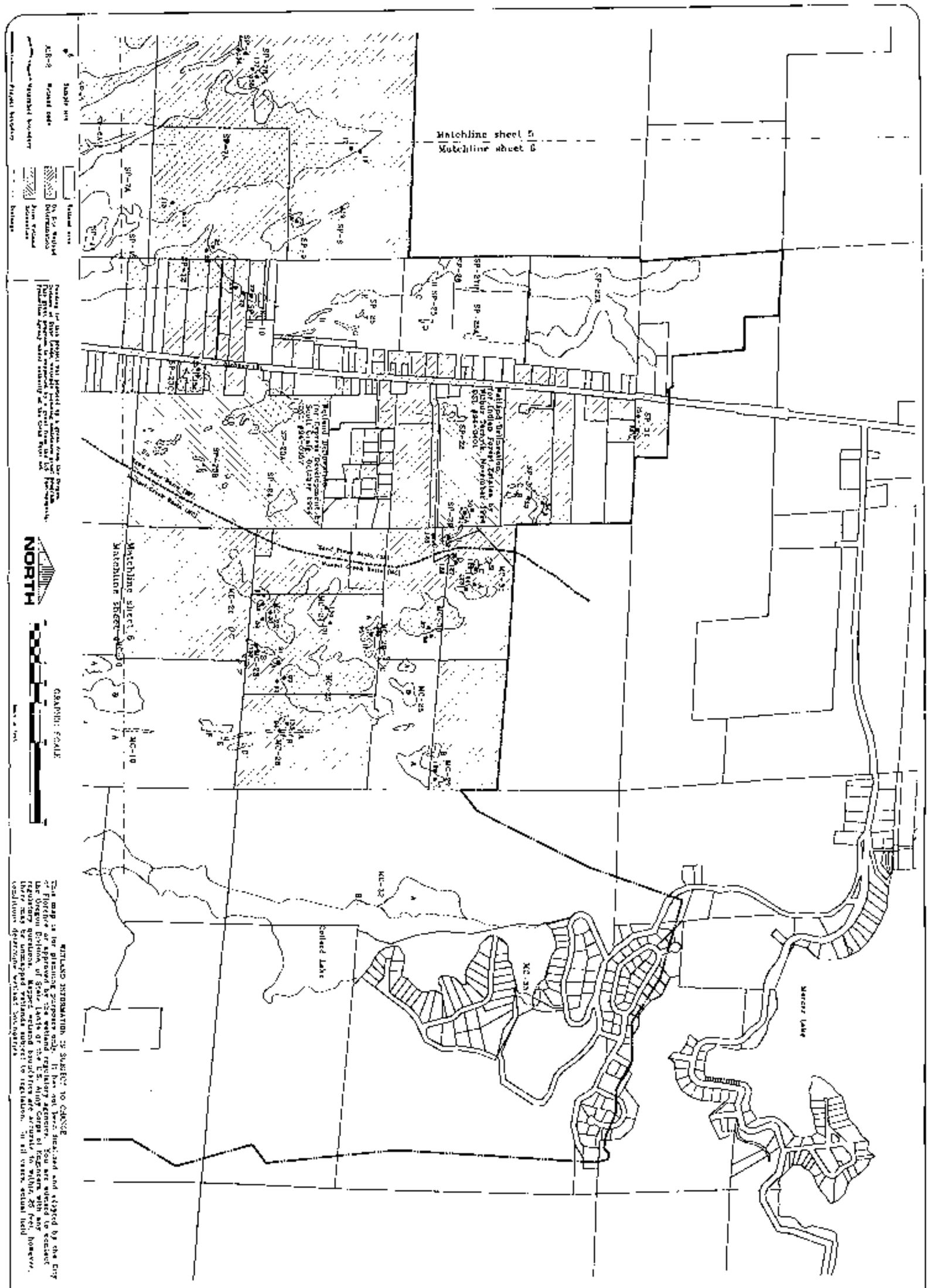
This map is for planning purposes only. It has not been finalized and adopted by the City of Florence or approved by the wetland regulatory agencies. You are advised to contact the Oregon Division of State Lands or the U.S. Army Corps of Engineers with any regulatory questions. Mapped wetland boundaries are accurate to within 25 feet, however, there may be unmapped wetlands subject to regulation. In all cases, actual field conditions determine wetland boundaries.

Florence Local Wetlands Inventory

Fig. 4E

Pacific Habitat Services, Inc.

PHS



DATE November, 1996

BASE MAP DATA Supplied by Lane County GIS Department & City of Florence

JOB NO G-1024

Florence
Local Wetlands Inventory

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, Oregon 97070
Phone (503) 570-0800

PHS

Fig. 4F

Table 8: The Classification of all Wetlands Identified in the City of Florence Local Wetlands Inventory.

Wetland	USFWS Wetland Classification								Total
Code	PAB	PEM	PFO	PSS	PUB	E2EM	E2SS	L2AB	Acreage
AIR-1A		1.42							1.42
AIR-2B			0.54						0.54
AIR-1C		1.18							1.18
AIR-1D						1.24			1.24
AIR-2			0.12						0.12
AIR-3				2.72					2.72
HB-1A		0.04		0.69					0.73
HB-1B			0.35						0.35
HB-2		0.33			0.49				0.82
HB-3A				0.66					0.66
HB-3B				1.05					1.05
HB-4A	1.34		2.00		3.34				6.68
HB-4B			3.19						3.19
HB-4C			0.53						0.53
HB-5A-D		1.99		3.07					5.06
MC-1 A-G		5.87							5.87
MC-2		0.08							0.08
MC-3A-D		13.97		16.22	2.53				32.72
MC-4A,B		0.46							0.46
MC-5A-E			14.20		5.68				19.88
MC-6A-D		6.57	4.38						10.95
MC-7A,B		2.09							2.09
MC-8A,B		3.77						2.52	6.29
MC-9		1.88	0.80						2.68
MC-10		12.99	3.71		1.86				18.56
MC-11A-E		2.82	1.21						4.03
MC-12A-F		0.32	1.97						2.29
MC-13			7.92	3.39					11.31
MC-14			15.41	5.14					20.55
MC-15				0.35					0.35
MC-16			2.75						2.75
MC-17			1.06						1.06
MC-18A,B			6.06						6.06

Table 8 (continued)

Code	PAR	PEM	PFO	PSS	PUB	E2EM	E2SS	L2AB	Acreage
MC-19A,B,C		0.63							0.63
MC-20			6.28	4.43					10.71
MC-21				2.15					2.15
MC-22			2.07	0.89					2.96
MC-23A-D			0.38	0.16					0.54
MC-24		1.61							1.61
MC-25		6.64	3.73						10.37
MC-26A-F		0.06	0.34						0.40
MC-27A,B		2.13							2.13
MC-28A-C			1.24						1.24
MC-29A-C			0.99						0.99
MC-30				3.86					3.86
MC-31A-D			1.02						1.02
MC-32A,B			4.99						4.99
MC-33		0.60							0.60
NJ-1				0.53					0.53
NS-1A-C			5.26		1.11				6.37
NS-2A,B			26.33						26.33
NS-3			1.68	5.64					7.32
NS-4			3.50	1.43					4.93
NS-5			0.04						0.04
NS-6				1.50					1.50
NS-7				0.40					0.40
NS-8A						0.72			0.72
NS-8B			4.03						4.03
NS-8C					0.54				0.54
NS-8D						0.18			0.18
NS-9							0.67		0.67
NS-10						2.98			2.98
OT-1				0.32		1.81			2.13
OT-2						0.49			0.49
OT-3						0.98			0.98
OT-4A,B		0.09							0.09
OT-5						31.00			31.00

Table 8 (continued)

Code	PAB	PEM	PFO	PSS	PUB	E2EM	E2SS	L2AB	Acreage
RH-1		0.96		1.43					2.39
RH-2					1.00				1.00
SP-1	3.54	1.77	8.84	3.54					17.69
SP-2		0.05							0.05
SP-3				0.79					0.79
SP-4				0.71					0.71
SP-5				5.82	13.57				19.39
SP-6A,B				0.65					0.65
SP-7A,B				14.99				33.17	48.16
SP-8				0.19					0.19
SP-9			1.42	0.77					2.19
SP-10				0.20					0.20
SP-11			0.19						0.19
SP-12				16.02					16.02
SP-13				0.88					0.88
SP-14			0.74		0.25				0.99
SP-15			0.13		0.38				0.51
SP-16		0.62							0.62
SP-17A,B			0.09		0.91				1.00
SP-18			0.75		2.24				2.99
SP-19			2.02						2.02
SP-20 A-D				1.20					1.20
SP-21					0.62				0.62
SP-22A,B,C				1.48					1.48
SP-23A,B		1.00	3.34						4.34
SP-23C				1.23					1.23
SP-24			0.99						0.99
SP-25A-I		1.94							1.94
SP-26			0.18						0.18
SP-27			11.08	4.75					15.83
SP-28			0.48						0.48
SP-29A,B,C				0.42					0.42
SP-30A,B,C				0.75					0.75
SP-31		0.20							0.20
SP-32A			4.72	7.87	18.90				31.49

Table 8 (continued)

Code	PAB	PEM	PFO	PSS	PUB	E2EM	E2SS	L2AB	Acreage
SP-32B				0.53					0.53
SP-33A,B				1.09					1.09
SP-34		0.90		1.62	2.12				4.64
SP-35A,B			2.24	5.61	14.59				22.44
SP-36A,B		0.44							0.44
SP-37					0.26				0.26
SP-38A,B,C		1.42							1.42
SP-39 A,B			1.67		2.50				4.17
SP-40		1.00		5.65					6.65
SP-41				0.63					0.63
SP-42A-F					11.00				11.00
SP-43A		2.64	6.60	17.16					26.40
SP-43B-D		0.25		0.12					0.37
SP-44					0.98				0.98
SP-45A,B				1.22					1.22
SP-46				0.53					0.53
TOTAL	**4.88**	**80.73**	**173.56**	**152.45**	**84.87**	**39.40**	**0.67**	**35.69**	**572.25**

PAB	Palustrine aquatic bed	4.88 (1%)
PEM	Palustrine emergent	80.73 (14%)
PFO	Palustrine forested	173.56 (30%)
PSS	Palustrine scrub shrub	152.45 (27%)
PUB	Palustrine unconsolidated bottom	84.87 (15%)
E2EM	Estuarine intertidal emergent	39.40 (7%)
E2SS	Estuarine intertidal scrub shrub	0.67 (0%)
L2AB	Lacustrine aquatic bed	35.69 (6%)
	Total Wetland Area:	**572.25**

Number of Wetlands:	270
Total Wetland Area (acres):	572.25
Total Size of Study Area (acres):	5400.21
Average wetland size (acres):	2.12
Percent of Wetland in Study Area:	11%

Table 9 is a summary of wetland classifications for each wetland area in the Florence LWI study area. Appendix B includes a wetland characterization sheet for each inventoried wetland. This summarizes the plant communities, hydrology, and location and any general notes about adjacent upland areas.

Table 9: Wetland Classifications found within the Florence LWI study area

Wetland Classification	Area (acres)	Percent
Palustrine forested	178.69	31
Palustrine scrub-shrub	144.61	25
Palustrine unconsolidated bottom	87.58	15
Palustrine emergent	80.73	14
Estuarine intertidal emergent	39.40	7
Lacustrine aquatic bed	35.69	6
Palustrine aquatic bed	4.88	1
Estuarine intertidal scrub shrub	0.67	<1
	572.25	100

5.3 Oregon Freshwater Wetland Assessment Methodology Results

5.3.1 Wetlands of Special Interest for Protection

Each of the wetlands were assessed according to the ten questions in this section of OFWAM. Due to the limited access in the project area, certain questions regarding the presence of federal or state listed threatened, endangered or sensitive species (Question 1) were answered "no" or "unknown" for all of the wetlands. Questions 2 through 9 were answered "no" for all of the wetlands. These questions relate to existing management plans, conservation plans, protected mitigation areas, critical habitat, and wetland reserve areas. Question 10 is related to the presence of uncommon wetland plant communities in Oregon. These plant communities are listed in Appendix G of OFWAM. This question was answered "yes" for the following wetlands: SP-9, SP-12, SP-23A,B,C, SP-30A, SP-34, SP-39A, SP-40, SP-41, NS-4, NS-6, MC-3A, MC-14, MC-15, MC-16, MC-25, and MC-30. A "yes" answer to any of the questions places the wetlands in the "Wetlands of Special Interest for Protection" category and management decisions should be made to protect the sites. Therefore, all of the wetlands with uncommon wetland plant communities are also wetlands of special interest for protection. Table 4 lists the wetlands in which uncommon wetland plant communities were observed, however, due to the lack of site access, it is possible that other wetlands in the study area may also contain uncommon wetland plant communities and would qualify as wetlands of special interest.

5.3.2 Wetland Quality Assessment

An assessment of the quality for each of the wetlands identified through the inventory was conducted using the *Oregon Freshwater Assessment Methodology* (OFWAM) (Roth et al, April 1996). OFWAM assesses 6 functions and 3 conditions, as described in Section 2.5.2.

Appendix C contains all of the results for each of the wetlands assessed by the methodology along with summary sheets of the functions and conditions assessed by the methodology and the rationale for the results.

Although OFWAM provides qualitative information on the relative value of wetlands and does not have a numerical ranking, numbers were assigned to the assessment criteria in order to easily compare the results. Table 10 (page 49) is a key to the numbers assigned to the assessment criteria for each of the functions and conditions. A number 1 was assigned to wetlands receiving the highest function or condition result (e.g. intact, diverse), a number 3 was assigned to the wetlands receiving the lowest result (lost or not present, not appropriate), and a number 2 was assigned to the results which do not fit the other criteria (potential, impacted or degraded). Table 11 (pages 50-54) shows the results of the quality assessment conducted on all of the wetlands identified through the inventory. Some functions or conditions were not applicable to certain wetlands. For instance the methodology states that if a wetland receives an assessment of "diverse wildlife habitat" then the enhancement potential assessment is not applicable. In addition, if there was no likelihood of fish habitat in the wetland, the fish habitat assessment was not completed.

In general the wetlands in the project area are all of relatively high quality due to the proximity of open water, the variety of wetland types and associated uplands, and the large areas of undeveloped "open space." All of these factors increase the wildlife and fish habitat value, and the aesthetic quality functions of the wetlands. Several of the wetlands, the lakes in the north and Munsel Creek are known to support populations of "sensitive" fish species. None of the wetlands received the lowest assessment (function lost or not present) for the fish or wildlife habitat sections, due to the connections to other wetlands or open water. Fish and wildlife habitat may have been impacted or degraded if the wetland was located in a developed area, had minimal buffers, or had been disturbed or modified, such as an excavated pond. In addition, the Oregon Department of Environmental Quality considers the Siuslaw River and the North Fork Siuslaw River to be water quality limited (ODEQ 1996). The Siuslaw River from its mouth to its headwaters is considered to be water quality limited due to high temperatures in the summer. The North Fork Siuslaw is considered to be water quality limited due to habitat modification, high amounts of sediment, and high temperatures in the summer.

The water quality function was assessed as impacted or degraded in many wetlands if the primary source of hydrology was groundwater and the dominant existing land use is open space. The rationale is that wetlands which are groundwater-driven or surrounded by open space may not play as significant a water quality function as wetlands derived from surface water or surrounded by developed lands. Hydrologic control was generally assessed as intact, due to "downstream" development around the perimeter of the lakes. Recreational and educational functions were considered impacted or degraded in a majority of the wetlands due to the lack of public access, developed paths and safety concerns associated with public access and handicap access. In addition, the majority of the wetlands are not easily viewed due to the thick brush and isolation of the areas.

Table 10: Key to the Oregon Freshwater Wetland Assessment Methodology Numerical Ranking

Wildlife Habitat	1 *Wetland provides diverse wildlife habitat* 2 *Wetland provides habitat for some wildlife species* 3 *Wetland's does not provide wildlife habitat*
Fish Habitat	1 *Wetland's fish habitat function is intact* 2 *Wetland's fish habitat function is impacted or degraded* 3 *Wetland's fish habitat function is lost or not present*
Water Quality	1 *Wetland's water-quality function is intact* 2 *Wetland's water-quality function is impacted or degraded* 3 *Wetland's water-quality function is lost or not present*
Hydrologic Control	1 *Wetland's hydrologic control function is intact* 2 *Wetland's hydrologic control is impacted or degraded* 3 *Wetland's hydrologic control function is lost or not present*
Sensitivity to Impact	1 *Wetland is sensitive to future impacts* 2 *Wetland is potentially sensitive to future impacts* 3 *Wetland is not sensitive to future impacts*
Enhancement Potential	1 *Wetland has high enhancement potential* 2 *Wetland has moderate potential for enhancement* 3 *Wetland has little enhancement potential*
Education	1 *Wetland has educational uses* 2 *Wetland has potential for educational use* 3 *Wetland site is not appropriate for educational use*
Recreation	1 *Wetland provides recreational opportunities* 2 *Wetland has the potential to provide recreational activities* 3 *Wetland is not appropriate for or does not provide recreational opportunities*
Aesthetic Quality	1 *Wetland is considered to be pleasing* 2 *Wetland is considered to be moderately pleasing* 3 *Wetland is not pleasing*

Table 11: Oregon Freshwater Wetland Assessment Methodology Numerical Ranking Results for the Florence Local Wetlands Inventory

Wetland Code	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Sensitivity to Impact	Enhancement Potential	Education	Recreation	Aesthetic Quality	Size (acres)
AIR-1A	2	2	2	1	2	1	3	3	3	1.42
AIR-1B	2	1	1	1	2	n/a	3	3	2	0.54
AIR-1C	1	1	1	1	2	n/a	3	3	2	1.18
AIR-1D	2	2	1	2	2	1	3	1	1	1.24
AIR-2	2	1	1	1	2	1	3	3	2	0.12
AIR-3	2	n/a	2	1	2	1	3	3	2	2.72
HB-1A	2	1	1	1	2	1	3	3	1	0.73
HB-1B	2	2	2	1	2	1	3	3	1	0.35
HB-2	1	1	2	1	2	1	3	3	1	0.82
HB-3A	2	n/a	2	1	2	1	3	3	1	0.66
HB-3B	2	n/a	2	1	2	1	3	3	1	1.05
HB-4A	1	1	2	2	2	n/a	3	3	1	6.68
HB-4B	1	n/a	2	1	2	n/a	3	3	2	3.19
HB-4C	2	n/a	2	1	2	1	3	3	2	0.53
HB-5A-D	2	n/a	3	1	2	2	3	3	1	5.06
MC-1	2	n/a	2	1	2	1	1	2	1	5.87
MC-2	2	n/a	2	1	2	1	1	1	1	0.08
MC-3A	1	1	2	1	2	n/a	3	2	1	31.74
MC-3B,C,D	2	n/a	2	1	2	1	1	1	1	1.19
MC-4	2	2	2	1	2	1	3	3	3	0.46
MC-5	1	n/a	2	1	2	n/a	3	3	1	19.88
MC-6	1	n/a	2	1	2	n/a	3	1	1	10.95
MC-7	1	1	1	1	2	n/a	3	2	1	2.09
MC-8	1	1	2	1	2	n/a	3	2	1	6.29
MC-9	1	1	1	1	2	n/a	3	2	1	2.68
MC-10	1	1	2	1	2	n/a	3	3	1	18.56

Table 11 (continued)

Wetland Code	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Sensitivity to Impact	Enhancement Potential	Education	Recreation	Aesthetic Quality	Size (acres)
MC-11	2	n/a	2	2	2	1	3	3	2	4.03
MC-12	2	n/a	2	1	2	1	3	3	1	2.29
MC-13	1	n/a	2	1	2	n/a	3	3	1	11.31
MC-14	1	n/a	2	1	2	n/a	3	2	1	20.55
MC-15	1	n/a	2	1	2	n/a	3	2	1	0.35
MC-16	1	n/a	2	1	2	n/a	3	2	1	2.75
MC-17	1	n/a	2	1	2	n/a	3	2	1	1.06
MC-18	1	n/a	2	1	2	n/a	3	3	1	6.06
MC-19	2	n/a	3	2	2	2	3	3	1	0.63
MC-20	1	1	1	1	2	n/a	3	2	1	10.71
MC-21	1	n/a	2	1	2	n/a	3	3	1	2.15
MC-22	1	n/a	2	1	2	n/a	3	3	1	2.96
MC-23	1	n/a	2	1	2	n/a	3	3	1	0.54
MC-24	1	n/a	2	1	2	n/a	3	3	1	1.61
MC-25	1	n/a	2	1	2	n/a	3	3	1	10.37
MC-26	2	n/a	2	2	2	1	3	3	1	0.40
MC-27	2	n/a	2	2	2	1	3	3	1	2.13
MC-28	2	n/a	2	2	2	1	3	3	1	1.24
MC-29	2	n/a	2	2	2	1	3	3	1	0.99
MC-30	1	n/a	2	1	2	n/a	3	3	1	3.86
MC-31	2	n/a	2	1	2	1	3	3	1	1.02
MC-32	1	1	1	1	2	n/a	3	1	1	4.99
MC-33	1	1	2	1	2	n/a	3	1	1	0.60
NJ-1	2	n/a	2	1	2	1	3	3	1	0.53
NS-1A,B	1	n/a	2	1	2	n/a	3	3	2	5.26
NS-1C	1	n/a	2	1	2	n/a	3	3	2	1.11

Table 11 (continued)

Wetland Code	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Sensitivity to Impact	Enhancement Potential	Education	Recreation	Aesthetic Quality	Size (acres)
NS-2A,B	1	1	2	1	2	n/a	3	3	1	26.33
NS-3	2	2	2	1	2	n/a	3	3	2	7.32
NS-4	1	1	2	1	2	n/a	3	3	1	4.93
NS-5	2	1	2	2	2	1	3	3	3	0.04
NS-6	1	n/a	2	1	2	1	3	3	3	1.50
NS-7	2	n/a	2	2	2	1	3	3	3	0.40
NS-8A	1	2	1	1	2	n/a	3	2	1	0.72
NS-8B	2	n/a	2	1	2	1	3	3	1	4.03
NS-8C	2	2	2	1	2	1	3	3	3	0.54
NS-8D	2	2	1	1	2	1	3	2	1	0.18
NS-9	1	n/a	2	2	2	n/a	3	2	1	0.67
NS-10	2	2	1	1	2	1	3	2	1	2.98
OT-1	2	2	1	2	2	1	3	1	1	2.17
OT-2	2	2	1	2	2	1	3	1	3	0.49
OT-3	2	2	1	2	2	1	3	1	3	0.98
OT-4	2	n/a	2	1	2	1	3	3	3	0.09
OT-5	2	2	1	1	2	1	3	1	2	11.00
RH-1	1	2	2	2	2	n/a	3	3	1	2.39
RH-2	2	2	2	1	2	1	3	3	3	1.00
SP-1	1	1	2	1	2	n/a	3	3	1	17.69
SP-2	2	n/a	3	2	2	2	3	3	1	0.05
SP-3	1	n/a	2	1	2	n/a	3	3	1	0.79
SP-4	1	n/a	2	1	2	n/a	3	3	1	0.71
SP-5	1	1	2	1	2	n/a	3	3	1	19.39

Table 11 (continued)

Wetland Code	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Sensitivity to Impact	Enhancement Potential	Education	Recreation	Aesthetic Quality	Size (acres)
SP-6A,B	2	n/a	2	1	2	1	3	3	1	0.65
SP-7A,B	1	1	2	1	2	n/a	3	3	1	48.16
SP-8	2	n/a	2	1	2	1	3	3	1	0.19
SP-9	1	n/a	2	1	2	n/a	3	3	1	2.19
SP-10	2	n/a	2	1	2	1	3	3	1	0.20
SP-11	2	n/a	2	1	2	1	3	3	1	0.19
SP-12	1	n/a	2	1	2	n/a	3	3	1	16.02
SP-13	2	n/a	2	1	2	1	3	3	1	0.88
SP-14	2	n/a	2	1	2	1	3	3	1	0.99
SP-15	2	n/a	2	1	2	1	3	3	1	0.51
SP-16	2	n/a	2	2	2	1	3	3	1	0.62
SP-17A	2	n/a	2	1	2	1	3	3	1	0.09
SP-17B	2	2	2	2	2	1	3	3	1	0.91
SP-18	1	2	2	2	2	n/a	3	3	2	2.99
SP-19	2	n/a	2	1	2	1	3	3	1	2.02
SP-20	2	n/a	2	1	2	1	3	3	1	1.20
SP-21	2	2	2	1	2	1	3	3	3	0.62
SP-22	2	n/a	2	1	2	1	3	3	1	1.48
SP-23A,B	1	n/a	2	1	2	n/a	3	3	1	4.34
SP-23C	1	n/a	2	1	2	n/a	3	3	1	1.23
SP-24	1	n/a	2	1	2	n/a	3	3	1	0.99
SP-25	2	n/a	2	2	2	1	3	3	3	1.94
SP-26	1	n/a	2	1	2	n/a	3	3	1	0.18
SP-27	1	n/a	2	1	2	n/a	3	3	1	15.83
SP-28	2	n/a	2	1	2	1	3	3	2	0.48

Table 11 (continued)

Wetland Code	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Sensitivity to Impact	Enhancement Potential	Education	Recreation	Aesthetic Quality	Size (acres)
SP-29	2	n/a	2	1	2	1	3	3	2	0.42
SP-30	2	n/a	2	1	2	1	3	3	1	0.75
SP-31	2	n/a	2	1	2	1	3	3	1	0.20
SP-32A	1	1	2	1	2	n/a	3	2	1	31.49
SP-32B	2	n/a	2	1	2	1	3	3	1	0.53
SP-33	2	n/a	2	1	2	1	3	3	1	1.09
SP-34	1	1	2	2	2	n/a	3	2	1	4.64
SP-35A	1	1	2	1	2	n/a	3	2	1	22.18
SP-35B	2	n/a	2	1	2	1	3	3	1	0.26
SP-36	2	n/a	3	2	2	1	3	3	1	0.44
SP-37	2	2	2	1	2	1	3	3	3	0.26
SP-38	2	n/a	3	2	2	1	3	3	1	1.42
SP-39	1	1	2	1	2	n/a	3	2	1	4.17
SP-40	1	1	2	1	2	n/a	3	2	2	6.65
SP-41	1	n/a	2	1	2	n/a	3	3	1	0.63
SP-42	2	2	2	1	2	1	3	3	3	11.00
SP-43A	1	n/a	2	1	2	n/a	3	3	1	26.40
SP-43B-D	2	n/a	2	1	2	2	3	3	1	0.37
SP-44	2	2	2	1	2	1	3	3	3	0.98
SP-45	2	n/a	2	1	2	1	3	3	1	1.22
SP-46	2	n/a	2	1	2	1	3	3	1	0.53

6.0 RIPARIAN INVENTORY RESULTS

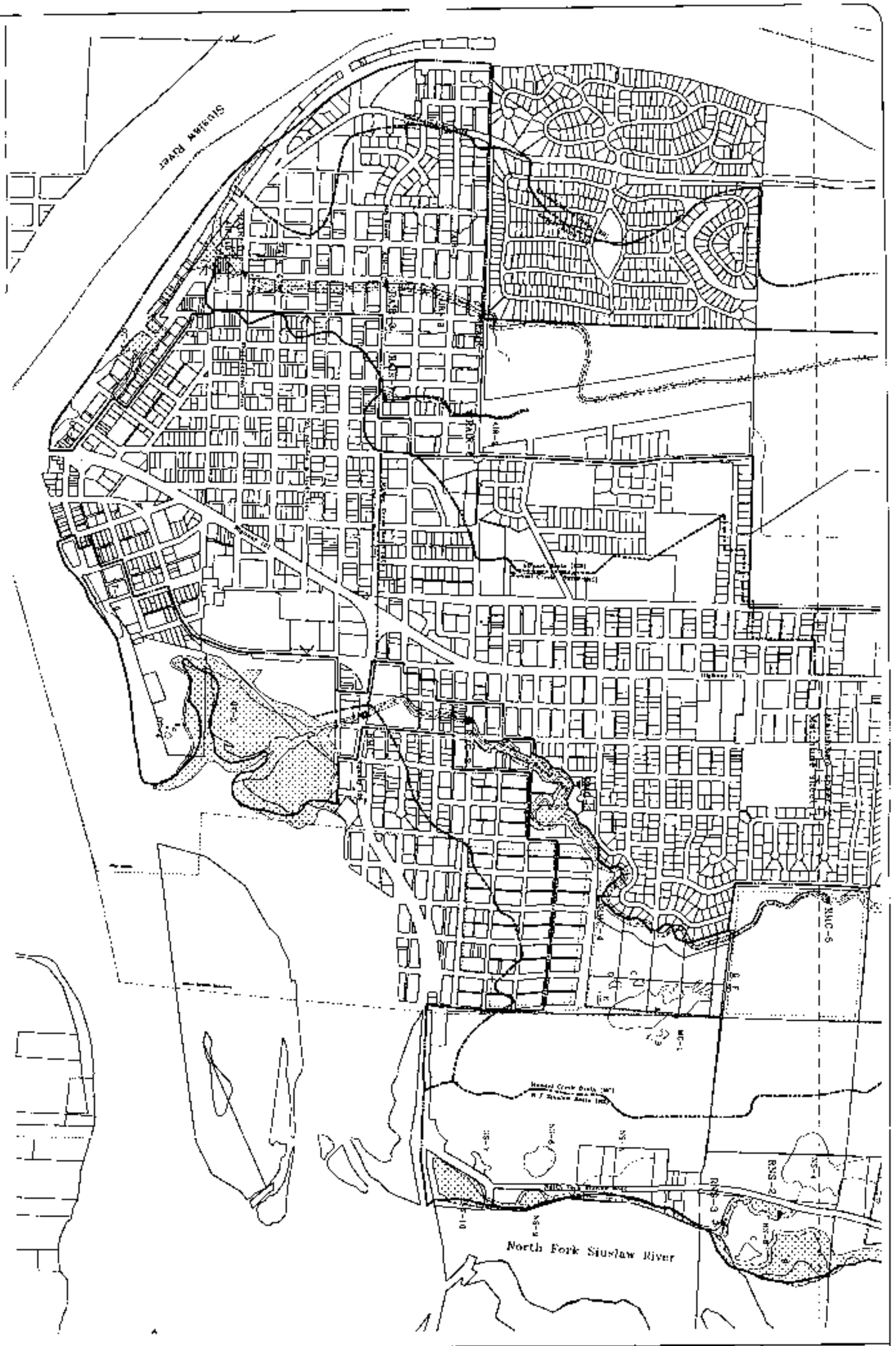
6.1 Riparian Acreage and Distribution

Twenty-six riparian assessments were conducted for drainages and lakes in the project area (Figures 5A-5F), thirteen of which are for the Munsel Creek drainage system. These drainages are either perennial creeks or connect several wetlands determined during the LWI. Each riparian area was assigned a code based on drainage basin and a number (e.g. RRH-1). A data sheet was compiled which documents the existing channel and vegetation conditions and estimates riparian measurements (Appendix D). The majority of the assessments were based on limited on-site observation due to the lack of project area access. Therefore, a majority of the riparian areas were assessed with a combination of on-site observation, an aerial reconnaissance flight, aerial photographs, and the topographic maps. Munsel Creek is the only named perennial drainage in the study area. A number of assessments were done for the creek at various access points, generally road crossings.

Riparian width was a subjective measurement based on an approximate horizontal width from the top of the bank to the outer edge of the drainage watershed or area of functional or physical contribution. This may be to the top of the nearest ridge in a topographically defined area, or to the approximate extent of shade and organic contribution in a level area. This width may or may not include wetlands, depending on the area. In a steep ravine the distance between the top of bank and the break in slope may be relatively narrow, and the distance from the break in slope to the top of the ridge may also be short. In contrast, a broad floodplain area may have a significantly wider width to a break in slope.

In general, the riparian areas associated with streams were often well-defined by topography in the Florence study area. The interdunal lakes had wider riparian areas due to the greater distance to a break in slope. The widest riparian areas were located at the confluence of the drainages and the lakes, where associated wetlands and floodplains were broader. Riparian widths ranged from 20 feet (RAIR-1) to 445 feet (RNS-1). The narrow riparian areas are associated with an excavated channel which extends from north of the Airport to the Siuslaw River. The widest riparian area is associated with an un-named perennial drainage which extends south of Munsel Lake to the North Fork Siuslaw River. Munsel Creek riparian areas range from approximately 30 feet to approximately 80 feet in width. Wider riparian areas are associated with the interdunal lakes and their drainages. These areas are approximately 100 feet wide and have associated wetlands.

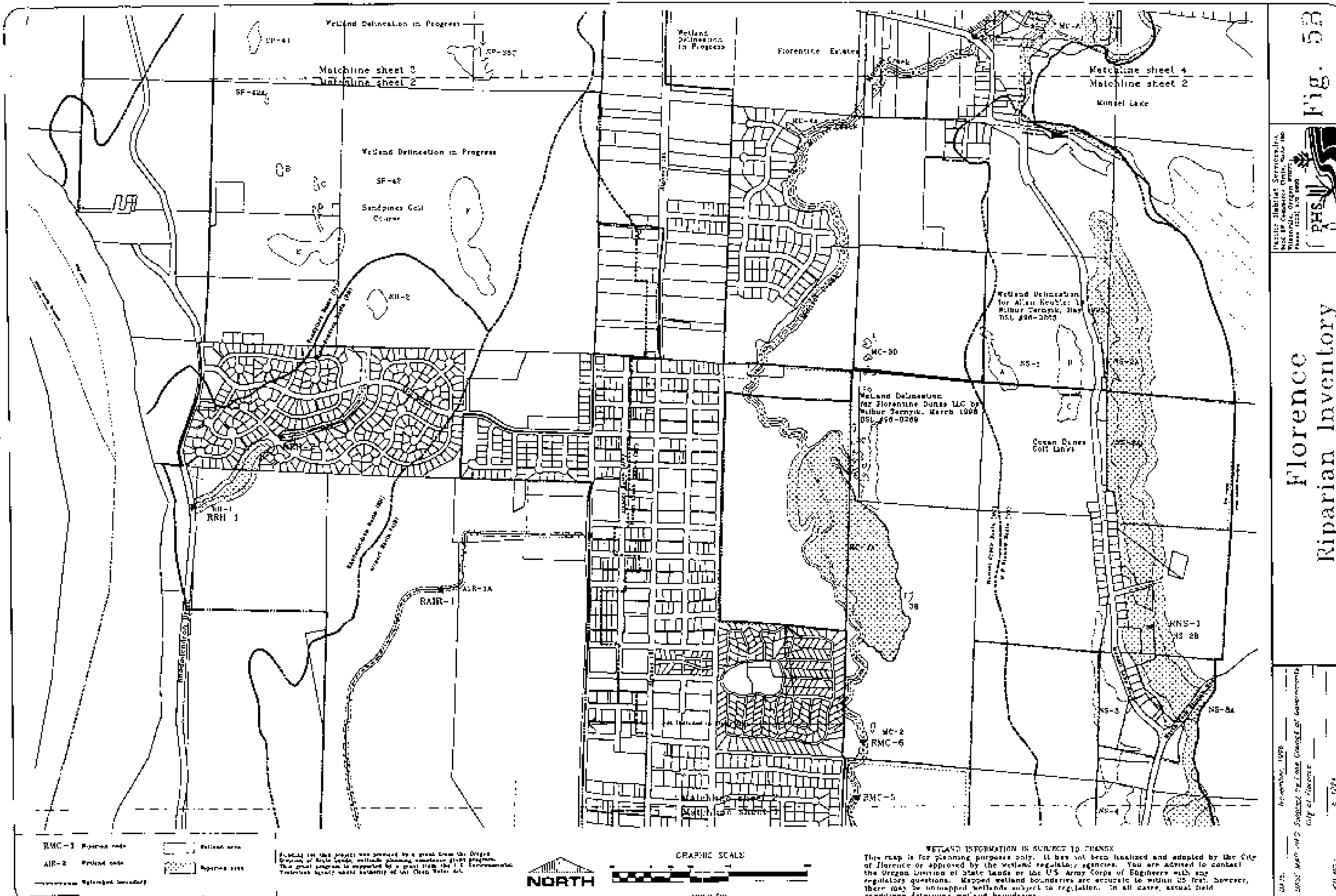
Total riparian area equals approximately 315 acres. The majority of the riparian area is in the Munsel Creek basin (RMC-1 through RMC-13). This area includes the riparian zones for Munsel, Ackerley, Clear, and Collard Lakes, as well as Munsel Creek. The Munsel Creek riparian areas total approximately 212.42 acres. This is followed by the North Fork Siuslaw River Basin riparian area (71.69 acres), the Airport Basin riparian area (23.30 acres), the Rhododendron Basin riparian area (6.44 acres), and the Heceta Beach Basin riparian area (1.16 acres). The acreage for the riparian areas are summarized in Table 12 (page 56).



Florence
Riparian Inventory

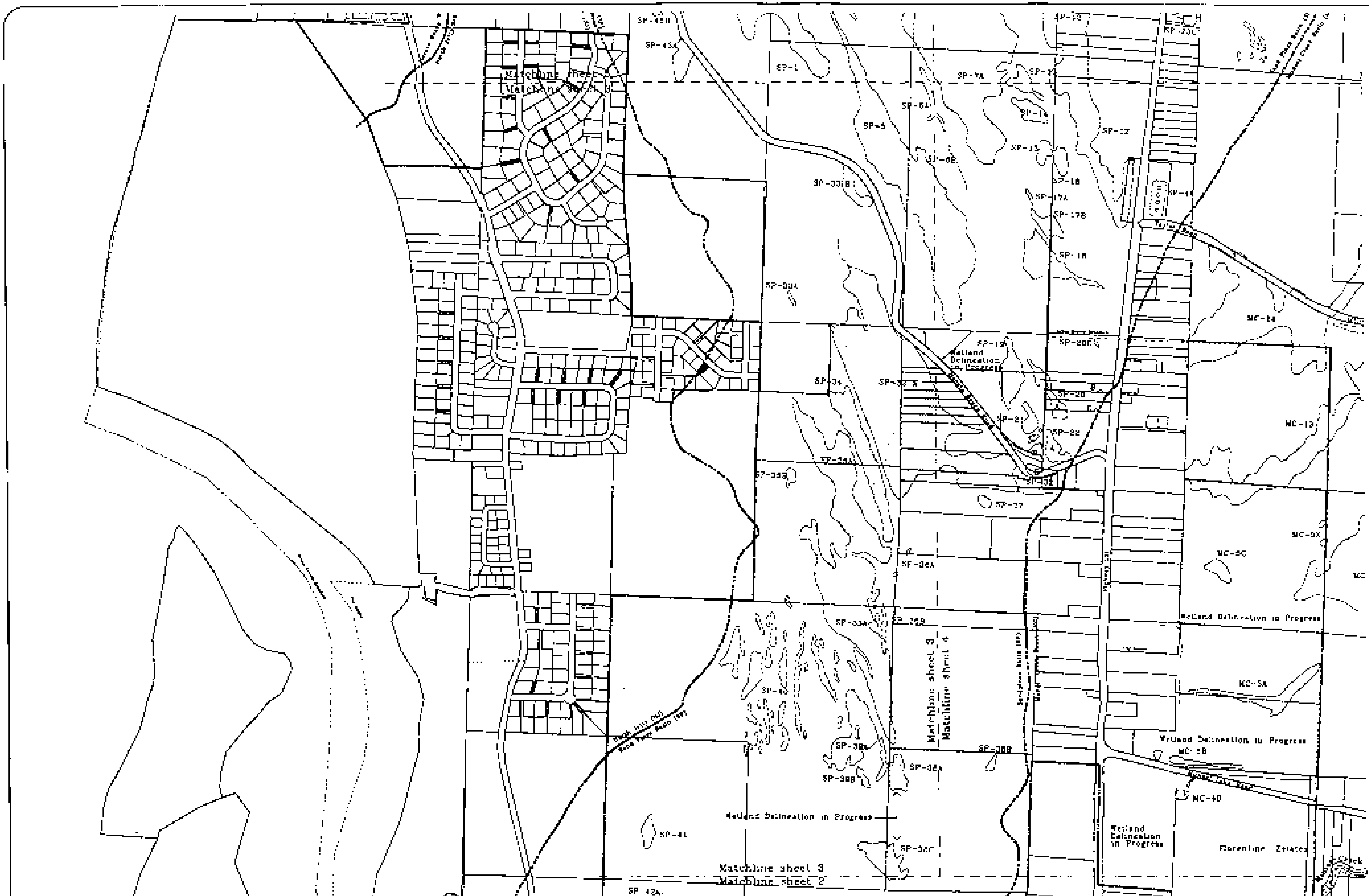
Pacific Habitat Services, Inc.

Fig. 5A


Wetland Delineation in Progress
SF-41
SF-38Z
Matchline sheet 3
Matchline sheet 2
SF-42A
Wetland Delineation in Progress
SF-42
Sandpines Golf Course
AH-2
Florentine Estates
Matchline sheet 4
Matchline sheet 2
Munsel Lake
MC-30
NS-1
RRH-1
BAIR-1
AIR-1A
Ocean Dunes Golf Links
RNS-1
NS 2B
MC-2
RMC-6
RMC-5
NS-3
NS-4
RMC-1
AIR-2
NORTH
GRAPHIC SCALE
WETLAND INFORMATION IS SUBJECT TO CHANGE
This map is for planning purposes only. It has not been finalized and adopted by the City of Florence or approved by the wetland regulatory agencies. You are advised to contact the Oregon Division of State Lands or the U.S. Army Corps of Engineers with any regulatory questions. Mapped wetland boundaries are accurate to within 25 feet. However, there may be unmapped wetlands subject to regulation. In all cases, actual field conditions determine wetland boundaries.
PHS
Florence
Riparian Inventory
Fig. 58

Florence Riparian Inventory

Fig. 5C



Wetland area
Riparian area
Potential boundary
Project boundary
Drainage

Funding for this project was provided by a grant from the Oregon Division of State Lands, wetlands planning assistance grant program.

NORTH

GRAPHIC SCALE

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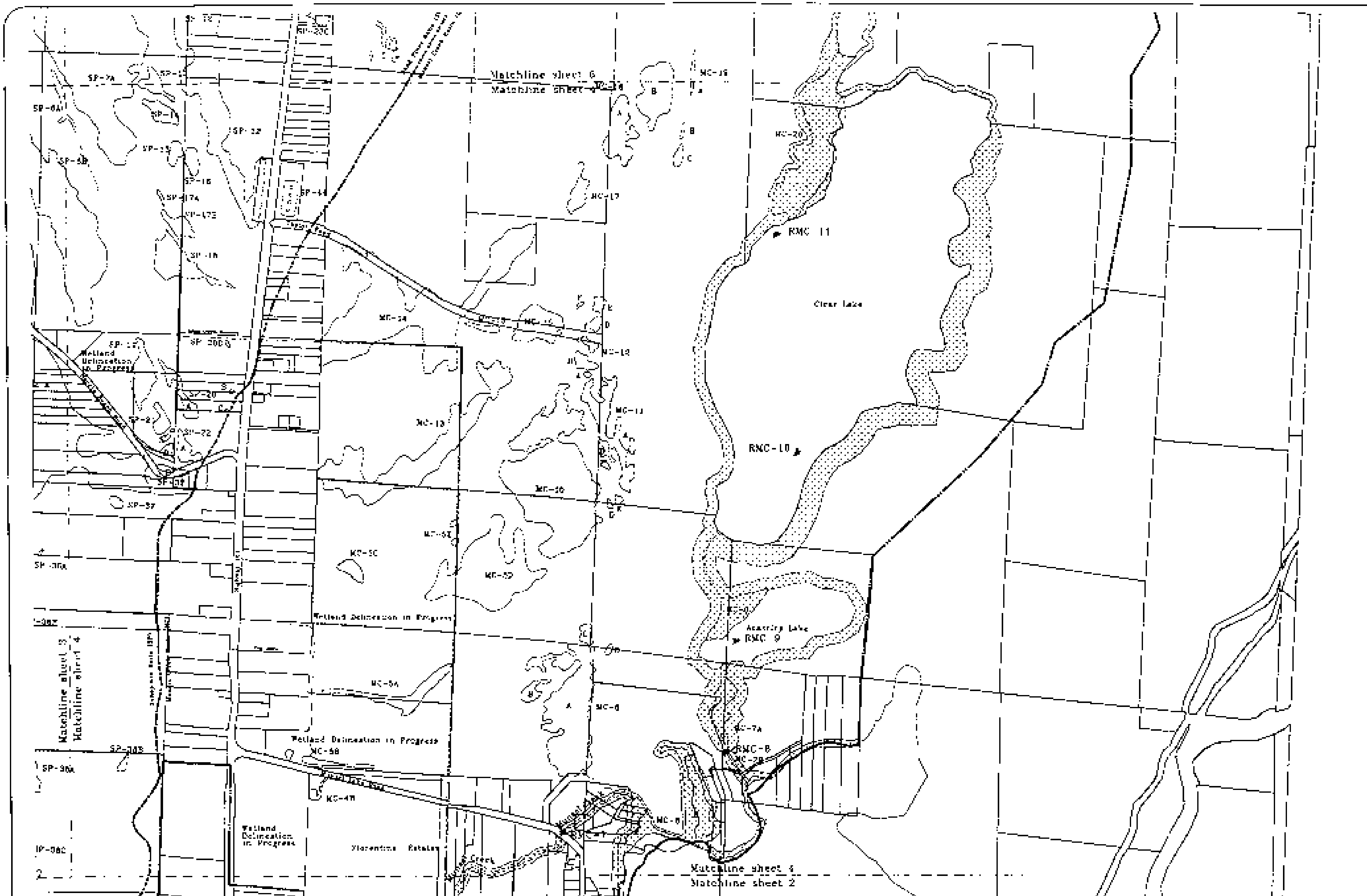
Pacific Habitat Services, Inc.

PHS

November, 1995



RMC-1 Riparian code
MCL-2 Wetland code
Watershed boundary
Project boundary
Wetland area
Riparian area
Drainage

Funding for this project was provided by a grant from the Oregon Division of State Lands, wetlands planning grant program. That grant program is supported by a grant from the U.S. Environmental Protection Agency under authority of the Clean Water Act.

NORTH

GRAPHIC SCALE

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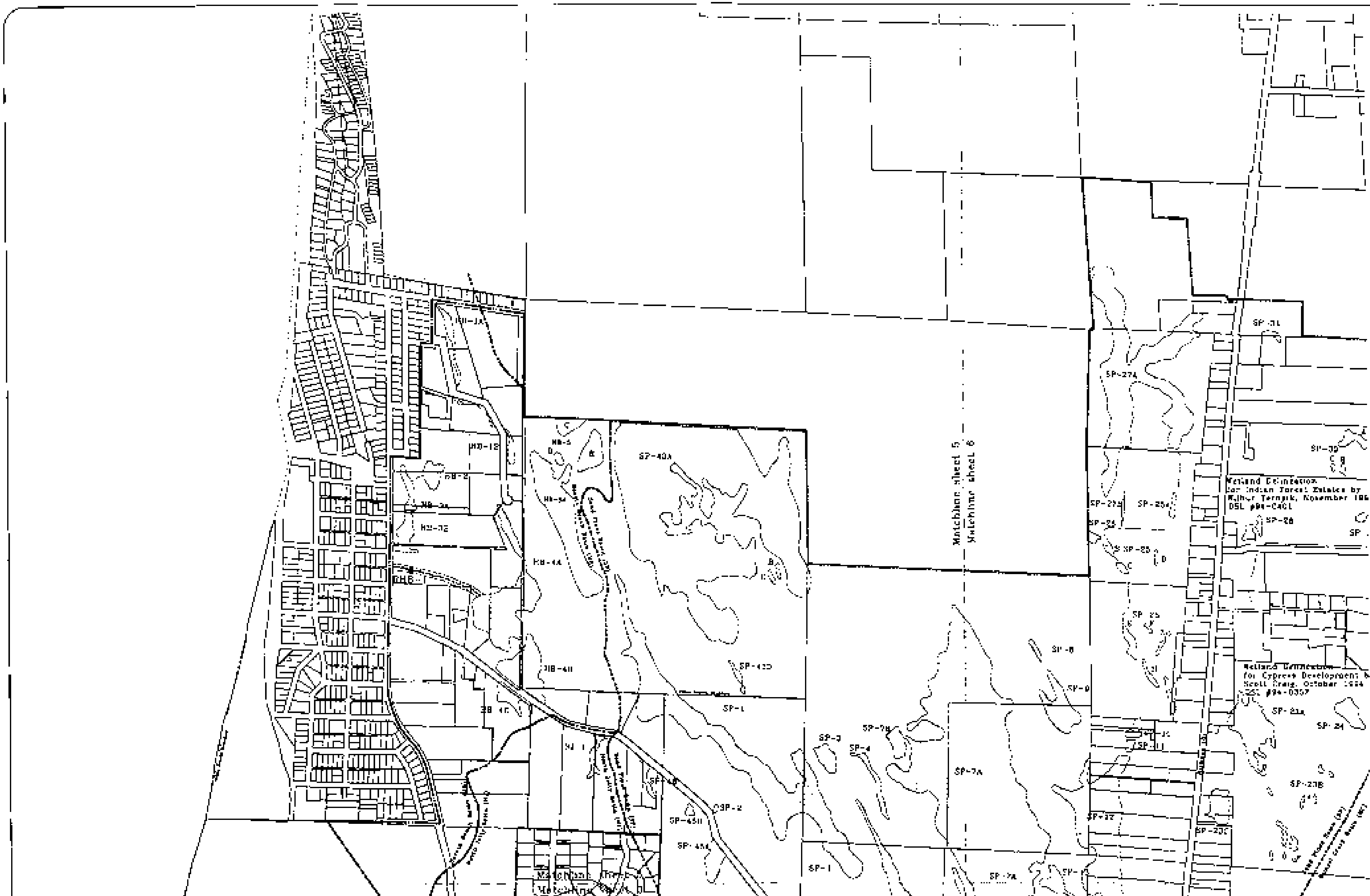
Fig. 5D

Pacific Habitat Services, Inc.
PHS

Florence
Riparian Inventory

November 1996
City of Florence
1994



RMC 1	Riparian code
SFB-2	Wetland code
	Delineated boundary
	Project boundary
	Wetland area
	Riparian area
	Drainage

Funding for this project was provided by a grant from the Oregon Division of State Lands wetland planning assistance grant program. This grant program is supported by a grant from the U.S. Environmental Protection Agency under authority of the Clean Water Act.

NORTH

GRAPHIC SCALE

WETLAND INFORMATION IS SUBJECT TO CHANGE

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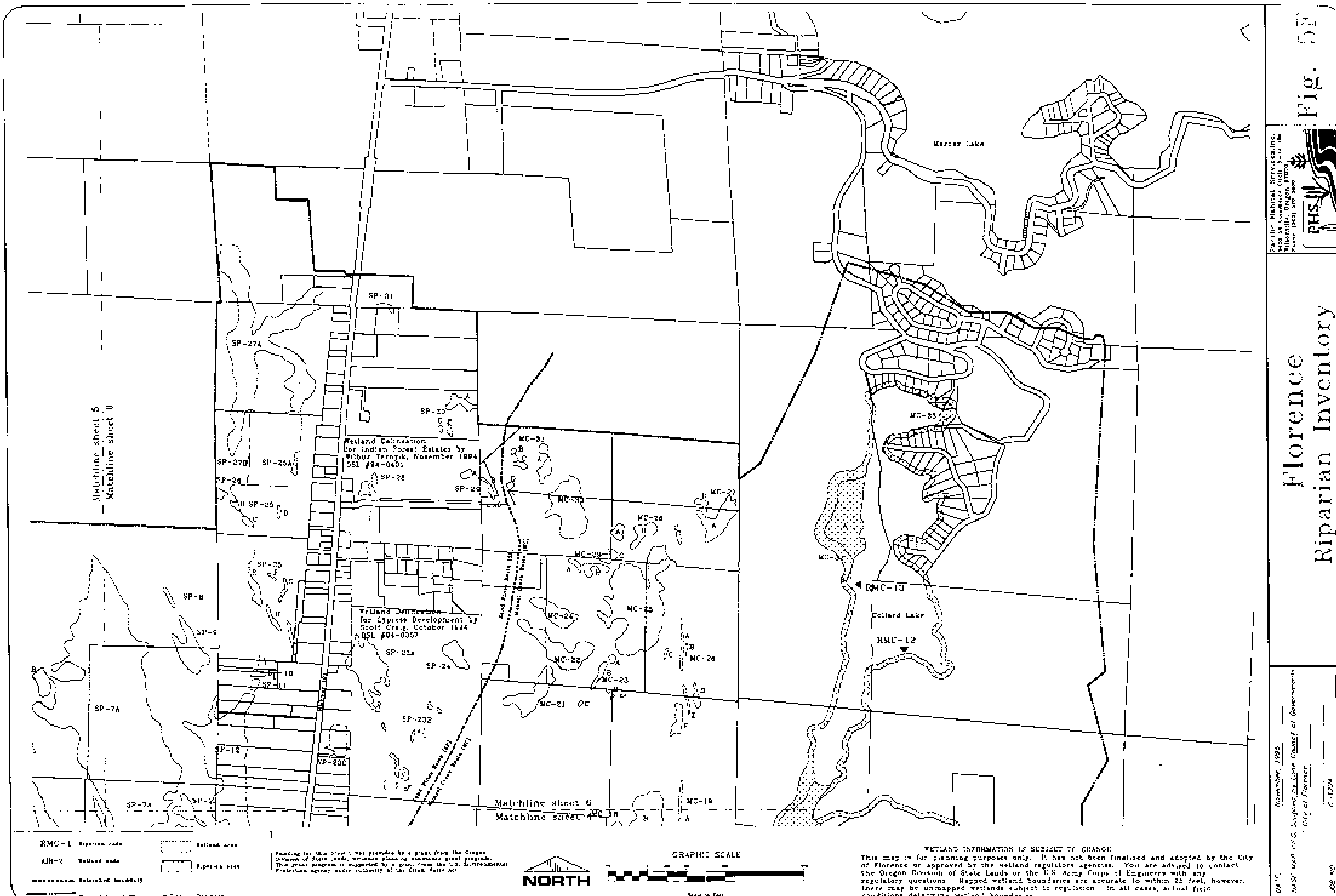
Pacific Habitat Services, Inc.

PHS

Florence Riparian Inventory

Fig. 5

DATE November 1996



Florence
Riparian Inventory
Fig. 5E
PHS
Mercer Lake
Collard Lake
RMC-13
RMC-12
MC-33
MC-32
MC-31
MC-30
MC-29
MC-28
MC-27
MC-26
MC-25
MC-24
MC-23
MC-22
MC-21
MC-19
SP-31
SP-30
SP-29
SP-28
SP-27A
SP-27D
SP-26
SP-26A
SP-25
SP-24
SP-23
SP-23A
SP-23D
SP-23C
SP-8
SP-9
SP-7A
SP-12
Matchline sheet 5
Matchline sheet 8
Matchline sheet 6
Matchline sheet 4
Wetland Delineation for Indian Forest Estates by Wilbur Ternyik, November 1994 DSL #94-0401
Wetland Delineation for Cypress Development by Scott Craig, October 1994 DSL #94-0357
GRAPHIC SCALE
NORTH
WETLAND INFORMATION IS SUBJECT TO CHANGE
This map is for planning purposes only. It has not been finalized and adopted by the City of Florence or approved by the wetland regulatory agencies. You are advised to contact the Oregon Division of State Lands or the U.S. Army Corps of Engineers with any regulatory questions. Mapped wetland boundaries are accurate to within 25 feet, however, there may be unmapped wetlands subject to regulation. In all cases, actual field conditions determine wetland boundaries.

6.2 Riparian Assessment Results

This riparian inventory formed the basis for the riparian quality assessment. A series of questions were answered relating to the riparian functions. A modified series of assessment questions was used for the off-site areas. Questions were answered 'A' for higher quality or more pristine areas, and 'C' for disturbed or lower quality riparian zones.

The majority of the riparian areas received high or moderate functional values for thermal regulation and erosion control. This is due to the fact that most of the drainages are well vegetated, undisturbed and with steep adjacent banks. For flood control/water quality the majority of the wetlands received a moderate functional assessment. This is due to the fact that the drainages generally have unrestricted flow, and their banks are vegetated with woody species. However, there are relatively few wetlands associated with the drainages, which decreases the floodwater storage potential of the system. In the wildlife habitat function, the majority of the riparian areas were assessed as having a high functional value. This is again due to the well vegetated and relatively undisturbed banks, variety of vegetation strata, and the presence of large woody debris in many of the drainages. Appendix E includes a copy of the riparian quality assessment questions and results. Table 13 (page 57) summarizes the results of the riparian quality assessment.

Table 12: Riparian Acreage

Basin	Code	Acreage	Basin Total
Munsel Creek	RMC-1	37.01	
	RMC-2	1.70	
	RMC-3 & 4	8.82	
	RMC-5 & 6	49.93	
	RMC-7	2.41	
	RMC-8 thru 13	94.52	212.42
North Fork Siuslaw	RNS-1	52.40	
	RNS-2 & 3	19.29	71.69
Airport	RAIR-1 & 2	10.41	
	RAIR-3	1.84	
	RAIR-4	2.77	
	RAIR-5	7.18	
	RAIR-6 & 7	1.10	23.30
Rhododendron	RRH-1	4.41	
	RRH-2	2.03	6.44
Heceta Beach	RHB-1	1.16	1.16
Riparian Acreage Total			**315.01**

Table 13: Summary of Riparian Quality Assessments for Florence

Riparian Code	Thermal Regulation	Erosion Control	Flood Control Water Quality	Wildlife Habitat
RAIR-1	L	M	M	M
RAIR-2	H	H	L	M
RAIR-3	H	H	M	H
RAIR-4	H	H	H	H
RAIR-5	L	M	M	M
RAIR-6	M	M	L	M
RAIR-7	M	H	M	M
RHB-1	M	H	M	H
RMC-1	M	M	M	H
RMC-2	M	M	M	H
RMC-3	H	M	M	H
RMC-4	H	H	M	H
RMC-5	M	M	M	H
RMC-6	M	H	M	H
RMC-7	H	M	M	M
RMC-8	H	H	H	H
RMC-9	H	H	H	H
RMC-10	H	H	M	H
RMC-11	L	M	M	H
RMC-12	H	M	H	H
RMC-13	L	M	M	M
RNS-1	H	H	H	H
RNS-2	M	H	H	H
RNS-3	L	H	M	M
RRH-1	M	M	M	H
RRH-2	L	L	H	M

H = High M = Moderate L = Low

7.0 PROJECT SUMMARY

- Pacific Habitat Services was selected in April 1996 to conduct a Local Wetlands Inventory and Riparian Inventory for the City of Florence, Oregon.

- Field work for the project was conducted between May and November 1996. Each wetland was assigned a code based on drainage basin. A wetland characterization and wetland assessment was completed for each wetland. The wetland assessment was based on the April 1996 version of the *Oregon Freshwater Wetland Assessment Methodology*.

- Project area access was limited, with approximately 60 percent of the project area off-site.

- A total of 270 wetlands were identified in the Florence project area, totaling approximately 572 acres. The largest wetlands are located at the Munsel Creek/Siuslaw River estuary, interdunal depressions north and south of Heceta Beach Road, and adjacent to Munsel Creek (OT-5, SP-7A and 32A, and MC-3A, respectively). Average size of the wetlands is 2.12 acres.

- The majority of the wetlands are palustrine forested (30%), with palustrine scrub-shrub comprising an additional 26% of the wetlands.

- The majority of the wetlands are of high quality, based on the OFWAM results. This is in part due to the proximity of a number of freshwater lakes, and the large areas of undeveloped land in the northern portion of the project area.

- Four uncommon wetland plant assemblages were noted in the Florence study area. *Ledum glandulosum/Sphagnum; Ledum glandulosum/Sphagnum/Darlingtonia; Vaccinium uliginosum/Deschampsia cespitosa; and Pinus contorta/Carex obnupta.* The first three communities were observed in the following locations: SP-9, SP-12, SP-23C, SP-39A, SP-40, SP-41, NS-4, NS-6, MC-3A, MC-14, MC-15, MC-16, MC-25, and MC-30.

- The riparian inventory assessed 21 areas associated with Collard, Clear, Ackerley, and Munsel Lakes, Munsel Creek, and several perennial and intermittent drainages in the basins. Riparian widths in the project area range from 40 to 445 feet.

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U.S. Geological Survey topographic map (*Florence Mercer Lake, OR, 1:24,000, 7.5-minute quadrangle, provisional edition 1984*).