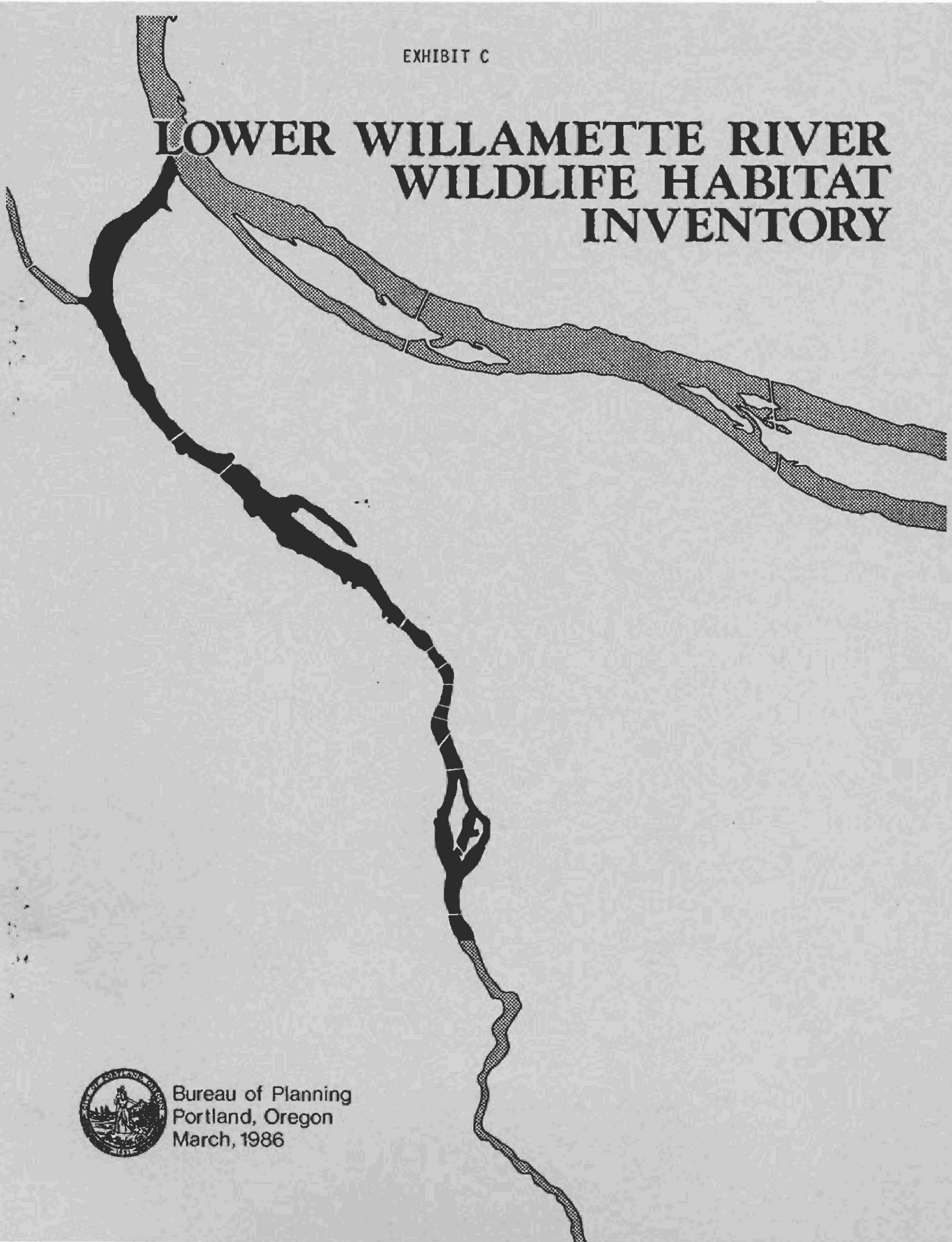
EXHIBIT C

LOWER WILLAMETTE RIVER WILDLIFE HABITAT INVENTORY



Bureau of Planning
Portland, Oregon
March, 1986

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LOWER WILLAMETTE RIVER WILDLIFE HABITAT INVENTORY

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Wildlife Inventory - Mike Houck, Audubon Society of Portland

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INTRODUCTION

Development along the Willamette River has had a dramatic impact on wildlife habitat and open space within the city limits. Marine industrial, downtown commercial and residential development has removed the majority of riverine riparian and associated wetland habitat that once covered the area. All of this change has had an impact on wildlife populations. However, there remain pockets of relatively undisturbed open space and habitat that still provide significant breeding, feeding, and resting sites for a great diversity of wildlife. Even an area as heavily impacted as Swan Island lagoon harbors a small remnant wetland, hosting a diversity of wetland flora and associated wildlife.

An objective of habitat management along the Willamette river should be to establish wildlife habitat "islands" that will aid in attracting wildlife to the area. These islands not only allow wildlife to live along the river, providing adequate cover, food, and water, but also provide wildlife with the ability for movement along the river. Isolated pockets of habitat are not as desirable as a series of areas which provide opportunities for movement along the river.

The objective of this inventory is to update wildlife habitat information for the Willamette Greenway within Portland's city limits. A fish and wildlife habitat inventory was conducted for the Lower Willamette River Management Plan in 1973. This inventory provided generalized information regarding relative habitat values throughout the study area. However, this information was limited to categories of Excellent, Good, Fair, and Poor habitat conditions and did not discuss in any detail the basis for these rankings, nor was there adequate site-specific detail.

This new inventory builds on the earlier one and provides additional information that relates to each of 174 identified habitat sites within the Greenway. The emphasis of the inventory is to document current conditions. Additionally, there is some discussion of wildlife potential of some specific areas if revegetated.

The inventory is composed of two reports. This is the first report, which presents the wildlife habitat inventory, ranks the habitat sites, and discusses the more significant sites. The second report, entitled Lower Willamette River Wildlife Habitat Inventory Data Sheets, consists of the data sheets for each habitat site, and the validation sheets.

This report is composed of three sections and an appendix. Section I consists of the Methodology, and discusses the rating system used, the rating sheets, the field inventory, the ranking of habitat sites, and validation of the rating system. Also included in the Methodology section is an application of the rating system to Portland parks within the Willamette Greenway.

Section II presents the results of the wildlife habitat inventory. For the purposes of discussion, the study area was divided into segments of similar length. Maps of each segment are included, identifying the habitat sites; a table is also included which presents the overall value assigned to each site. This is followed by a discussion of the Rank I, II, and III sites within each segment, and a generalized discussion of the Rank IV and V sites. The discussion includes a description of each Rank I, II, and III site, noting topography, land uses, vegetation, and observed wildlife.

Section III discusses potential ways to improve wildlife habitat along the Willamette Greenway. The section discusses in general terms what is needed to improve habitat sites, in terms of water, food and cover, and human disturbance.

The appendix consists of a list of native plant species and their importance to wildlife.

I. METHODOLOGY

A. Selection of the Wildlife Habitat Rating System

After reviewing methods of rating habitat areas, it was decided to use the Wildlife Habitat Assessment (WHA) Rating System, developed for the City of Beaverton in 1983 as part of their Statewide Planning Goal 5 update. This rating system provided the appropriate level of detail needed for the Willamette Greenway inventory, had been field-tested in the Portland area, and approved by Federal and State agencies involved in the Willamette Greenway.

The key to development of the WHA rating system was participation by biologists from a number of agencies, who developed the system, and determined the criteria to be included under each component. The rating system was designed by a Technical Advisory team consisting of staff from:

i/ U.S. Environmental Protection Agency;
ii/ U.S. Fish and Wildlife;
iii/ U.S. Corp. of Engineers;
iv/ Oregon Dept. of Fish and Wildlife;
v/ Audubon Society of Portland;
vi/ The Wetlands Conservancy; and
vii/ Beaverton Planning Bureau.

The Wildlife Habitat Assessment Rating System reviews each identified habitat site in terms of its potential for wildlife. The rating system is based on the fact that all wildlife has three basic requirements for survival - Food, Water, and Cover. These form the three major components of the assessment. Each site is evaluated in terms of the relative quantity, quality, diversity, and seasonality of water, food, and cover offered on the site. Also considered is the degree and permanence of physical and human disturbance on the site, whether there are other usable habitat areas nearby, and the unique features on the site, including wildlife, flora, scenic qualities, rarity of habitat, and educational potential. Each of these is discussed below in part C "Discussion of the Rating Sheets".

The rating system is not intended to provide a comprehensive analysis of each site, but allows relative values between habitat areas to be determined and compared. Should an indepth study of specific sites be required, a more detailed biological analysis would be appropriate.

B. Conducting the Field Inventory

Representatives from the Audubon Society of Portland and the Portland Bureau of Planning inventoried all land within the Willamette Greenway in the city of Portland. The field observations were conducted from July through September, 1985. The inventory began at the Multnomah Channel (between Sauvie Island and the Oregon bank of the Columbia River), proceeding upstream along the west bank to the southern limits of the city of Portland. The inventory then began on the east bank at the southern city limits, proceeding downstream to the confluence of the Willamette and Columbia rivers.

The Lower Willamette River Management Plan (LWRM Plan) divided land along the Willamette River into geographic zones, based on similarity of land uses. In order to allow comparison of the wildlife inventory developed in 1973 for the LWRM Plan, the same geographic zones were used.

The inventory reviewed each of these zones and identified areas of similar habitat, referred to as "sites". Each of these sites was then assessed, using the rating system. In addition, the topography and existing land uses were noted, as was the existing vegetation and observed wildlife. Color slides were taken of each habitat area, to photodocument existing conditions. Tape recordings were made to allow for detailed follow-up comments, and to aid in interpreting the slides.

Following the completion of the inventory, the sites and their overall values were transferred to aerial photographs. It was then possible to compare overall values for all sites. In this manner we determined whether those sites receiving similar values were in fact similar, and whether those sites receiving disparate values were different enough in terms of their rating components to justify the difference indicated by the value. Further field checking was done in those instances that demanded closer review or additional information. This analysis ensured that the final overall values reflected the relative differences between sites.

It is not surprising that this methodology yielded similar results to that of the LWRM Plan, which assigned a value of 100% to the Oaks Bottom area and rated all other sites relative to that. In the 1985 inventory, Oaks Bottom received the highest overall value, with a score of 114 out of a possible 116.

C. Discussion of the Rating Sheets

This subsection discusses the Wildlife Habitat Assessment rating sheets. An example is included as Figure I.

The form is divided into three parts. The first presents general information about the site, to aid in identification. Included here are the Unit No., Location, Sq.Ft., Score, and Comments.

Unit No. - A space is provided for the observer to label each site with an individual identification number.

Location - Space to briefly describe the site location.

Sq. Ft. - The approximate square feet could be noted here. This was not used for this inventory.

Score - The cumulative score after the rating sheet has been filled out is noted here. The scoring is done while in the field, trying to rate as many sites as possible per day.

Comments - This space is used for additional remarks on the reasoning behind specific numeric ratings or for potential of the site for rehabilitation, etc.

The second part consists of the water, food, and cover values (referred to as components). Each of these components is further divided into a number of aspects.

Water: Four aspects of the water regime on a site were included on the rating form - Quantity and Seasonality, Quality, Proximity to Cover, and Diversity. All of these factors play an important role in the site's significance to wildlife.

It is also important to note that the relative value of these aspects compared to the other Components (Food and Cover) are higher. The total number of possible points from the Water component is 30, while the highest totals for Food and Cover are 24 and 28, respectively. The reason for this weighting of the relative value of the water component is that wetlands and riparian zones are of critical importance to all wildlife species and the only place where some species can survive and

Figure 1

Wildlife Habitat Assessment

UNIT NO.	LOCATION	SQ. FT.	SCORE *	SCORE **

COMMENTS _____

COMPONENT		DEGREE	SCORE *	SCORE **	COMMENTS
WATER	Quantity & Seasonality	NONE 0 — SEASONAL 4 — PERENNIAL 8			
	Quality	STAGNENT 0 — SEASONALLY FLUSHED 3 — CONTINUALLY FLUSHED 6			
	Proximity to Cover	NONE 0 — NEARBY 4 — IMMEDIATELY ADJACENT 8			
	Diversity (Streams, Ponds, Wetlands)	ONE PRESENT 2 — TWO PRESENT 4 — THREE PRESENT 8			
FOOD	Variety	LOW 0 — MEDIUM 4 — HIGH 8			
	Quantity & Seasonality	NONE 0 — LIMITED 4 — YEAR AROUND 8			
	Proximity to Cover	NONE 0 — NEARBY 4 — IMMEDIATELY ADJACENT 8			
COVER	Structural Diversity	LOW 0 — MEDIUM 4 — HIGH 8			
	Variety	LOW 0 — MEDIUM 4 — HIGH 8			
	Nesting	LOW 0 — MEDIUM 2 — HIGH 4			
	Escape	LOW 0 — MEDIUM 2 — HIGH 4			
	Seasonality	NONE 0 — LIMITED 2 — YEAR AROUND 4			

* Existing ** Enhancement Potential

ADDITIONAL VALUE				
DISTURBANCE	PHYSICAL	PERMANENT 0 — TEMPORARY 2 — UNDISTURBED 4		
	HUMAN	HIGH 0 — MEDIUM 2 — LOW 4		
INTERSPERSION		LOW 0 — MEDIUM 3 — HIGH 6		
UNIQUE FEATURES 0 - 4		WILDLIFE _____ FLORA _____ SCENIC _____ RARITY OF HABITAT TYPE _____ EDUCATIONAL POTENTIAL _____		

Developed With the Assistance of:

Mike Houck-Audobon Society
Ralph Rogers-U.S. Army Corps of Engineers
Dennis Peters-U.S. Fish & Wildlife Service
Diana Hwang-U.S. Fish & Wildlife Service
Gene Herb-Oregon Dept. of Fish & Game
Jack Broome-Wetlands Conservancy

reproduce. Therefore it is possible that a site with water only and relatively few other components would rank higher than an upland site with the same food and cover values.

Quantity & Seasonality - This aspect refers to the amount of water available on site, and its seasonality. Seasonal water sources were given a value of 4 and Perennial water sources (available year round) a value of 8 because year round water supply is significantly more important to wildlife.

Quality - Stagnant water sources were given a value of 0, Seasonally flushed a value of 3, and Continually flushed a value of 6. It was initially desired to have some value included reflecting the quality of the water on the site. However, actual water quality analyses were not feasible. Therefore an indirect measure of quality, "flushing", was selected. In actuality, even stagnant water has some wildlife habitat value, but it was decided to assign stagnant water a value of zero, as seasonally flushed or continually flushed water has higher value for wildlife, and because the presence of stagnant water indicates the presence of other factors which often result in lower wildlife values.

Proximity to Cover - Wildlife will use water more if it is close to vegetative cover. This allows escape from predators and protection from weather extremes. The closer and more dense the cover, the more important the water source to many species. Dense cover immediately adjacent to a water source gave the site a value of 8, nearby cover a value of 4, and no cover a value of zero.

Diversity - A site with a mixture of wetland, stream and open pond or lake has higher wildlife value than a site with only one of these features. The ranking ranges from a low of 2 (one water source only) to 8 (three or more water sources present). Only five sites received a value of 8. The vast majority had no source or only one, the Willamette River.

Food : Food is a basic requirement for any organism. Wildlife species cannot survive in one area for any appreciable period of time without food. The greater the variety and quantity of food, the greater the potential for serving the needs of more wildlife species. The three aspects included under food are Variety, Quantity and Seasonality, and Proximity to Cover.

Variety - The variety of food on a site was rated from 8 (high) to 0 (low).

Quantity and Seasonality - This aspect measures the amount of food and its availability (is it available year round?), with sites having both large quantities of food available year round receiving a value of 8, and those with little or no food available only on a seasonal basis receiving a value of 0.

Proximity to Cover - As with water, the presence of adjacent cover from which to forage for food and escape predation by other native wildlife or domestic animals is important. Proximity to cover is also ranked from zero to 8.

Cover: The aspects of cover included here (structure, variety, nesting, escape, and seasonality) attempt to describe the physical environment of the site from a number of perspectives that are important to wildlife.

Structural Diversity - What is looked for in this category is the vertical stratification of vegetation on a site. That is, is there only one layer of vegetative cover (eg.- lawn, or one layer of shrub such as Himalayan blackberry) or are there two, three, or more layers. The most diverse structural system in our area would be multi-layered, with a ground layer of herbaceous vegetation (grasses, wildflowers,etc), a second layer consisting of shrubs (Himalayan blackberry, Snowberry, Oregon Grape, Sword Fern, etc.), perhaps another layer of taller plants (Red and Blue Elderberry, Indian Plum, Rex Osier Dogwood), a short tree layer (Flowering Dogwood, Hazelnut, saplings of taller species), and finally the tall canopy layer (Douglas Fir, Western Hemlock, Big-Leaf Maple, Black Cottonwood, Oregon White Ash, Oregon White (Garry) Oak,etc). The more layers present, the greater the surface area for feeding, travelling, and breeding available to a wider diversity of wildlife species. Values range from 8 for high structural diversity, to zero for low or no structural diversity.

Variety - Within any one layer or when considering all layers, if structural diversity is high, there will be more variety of cover. Variety of cover is important from cover, feeding and reproductive standpoints. The greater the variety of cover, the more important the habitat. For example, a forested wetland with a mixture of rushes, sedges, smartweed, spirea, and willows, will be a much more important wildlife habitat area than a wetland with a monoculture of Reed Canarygrass. Variety values range from 8 for high variety, to zero for no or low variety.

Nesting - While there may be both good variety and diversity of vegetative cover, the overall nesting potential may vary from site to site. This aspect was added to address the overall nesting potential of the site for a variety of species. Nesting values range from 4 for high nesting potential, to zero for no or low potential.

Escape - This aspect is primarily a function of density of cover and its ability to afford escape from predation. A value of 4 is assigned to sites which offer a high possibility of escape, and zero for no or a low ability to escape.

Seasonality - As with water and food, a habitat site will be less important to wildlife if that component is not present year round. Regarding cover, this relates primarily to whether all of the vegetation is deciduous or evergreen. If there is some evergreen vegetation or the deciduous vegetation retains some of its canopy, the site will receive a higher value. Most of the Willamette Greenway sites would received a low values, since most of the vegetation is deciduous. Some of the sites have a vegetative cover sufficiently dense so as to provide important cover throughout the year, including Oaks Bottom, Ross Island, Harborton, and Kelley Point Park. Vegetative cover available year round received a value of 4, limited cover a value of 2, and on seasonal coverage a value of zero.

The third part of the form includes values in addition to food, water, and cover. The components examined include disturbance, interspersion, and unique features.

Disturbance: Disturbance is examined from two perspectives - physical and human.

Physical - This category was used to assign a higher value to those sites with little disturbance, to reflect the fact that the removal or disturbance of physical components (food, water, cover) is detrimental to wildlife. However, it is also recognized that such a disturbance could be relatively short-lived (eg. the placement of a sewerline down a stream channel), while others are long-term or permanent. An undisturbed or relatively undisturbed site received a maximum value of 4, with those sites with temporary physical disturbances receiving a value around 2, and those areas disturbed permanently or long-term a value of zero.

Human - Human and human-related (domestic animals) disturbances can be very detrimental to wildlife. Even though an area is highly disturbed from a physical perspective, it may receive little human use. This is true along large stretches of the Willamette Greenway. A site could theoretically receive a zero for physical disturbance (ie highly disturbed) and a 4 for low human disturbance. The potential value ranges from 4 for low human disturbance, to zero for high human disturbance.

Interspersion: Habitats are important to one another in the sense that a number of different habitats adjacent to one another can provide an overall diversity of vegetative cover, food, and often water. Therefore an isolated site surrounded by pavement, buildings, empty fields, etc. will receive a lower zinterspersion value than would be the case if the site was surrounded by other habitat types, such as wetlands (emergent, forested, shrub), upland forests, shrubby areas, or meadows. If the surrounding sites were similar in make-up or represented only one habitat type, the site would receive a lower interspersion value than one surrounded by a variety of habitat types. The interspersion value ranges from 6 for high interspersion, to zero for low interspersion.

Unique Features: This component is intended to take into account other factors which might make the site unique to plants, animals, or humans. Aspects included are wildlife, flora, scenic quality, rarity of habitat, and educational potential.

Wildlife & Flora - If there is a particular species or plant or wildlife which is sensitive or unique in some way, then the site would receive a value ranging from 1 to 4, depending on how unique it is. For example, a site with Wapato growing on it would receive a 4 since Wapato has been virtually eliminated from along the Willamette River in Portland, due to floodplain alteration and wetland destruction. A site with a heron rookery would receive a 4 for similar reasons.

Scenic Quality - Scenic quality is a subjective evaluation of how the site compares to surrounding land uses. A site considered as having aesthetic qualities (generally from a natural state perspective) or offering views of sites which have aesthetic qualities received values up to 4.

Rarity of Habitat - Rarity of Habitat refers to whether the site has any species considered rare from a regional or national perspective, or in terms of their scarcity within the Portland Willamette Greenway, or an area of the Greenway. The highest value receivable is 4.

Educational Potential - Educational potential relates to the site's potential for educational uses, whether by school groups or private educational institutions. If the site has good public access and is not too distant from a population center, it might be given a rating of 1 to 4 depending on the significance of the site (a summation of all the other values).

It should be noted that Enhancement Potential is listed on the form but was not been used in evaluating the sites. Comments regarding enhancement potential were noted on the tape.

There is also a column for comments about any of the components, to further explain the reasons for the values given. The Willamette Greenway inventory relied primarily on the tape-recorded descriptions completed in the field for comments.

D. Ranking the Habitat Sites

Each of the habitat sites received a numeric rating, based on the overall value or score that each achieved. Each site was then assigned to one of five ranking groups, from I to V, with those in I having the highest values, and those in V the lowest. A discussion of each ranking follows.

Rank I : (Values 114 to 90)
Those sites which, if left unaltered, have an extremely significant combination of features which attract a diverse array of wildlife. The sites are essentially natural in character, although some disturbance (natural or human) exists in all of these sites.

Rank II: (Values 89 to 70)
Those sites which have been moderately altered, or are surrounded by lands which have been dramatically altered, or are of essentially natural character but are smaller in size than Rank I sites. These sites also attract a wide variety of wildlife, but less so than the Rank I sites. These sites are prime candidates for sensitive development, designed to preserve their natural character, incorporating it as an amenity for the site, and for the surrounding land uses.

Rank III: (Values 69 to 40)

Those sites which have been greatly altered, or are surrounded by areas with conflicting land uses which make use of the site by a variety of wildlife less likely. They still have considerable vegetative character which could provide significant wildlife habitat for numerous nongame species, especially birds. Many of these sites could be elevated to Rank II status by:

i) providing adequate buffering from adjacent uses;
ii) creation of wetlands or other water features;and
iii) planting a diverse variety of wildlife-attracting species of trees, shrubs, and forbs.

Rank IV: (Values 39 to 30)
Rank V: (Values 29 to 0)

Existing vegetation on sites in these categories currently have relatively little value, in terms of their ability to attract a wide variety of wildlife species. Those in Rank IV tend to have higher values due to slightly better vegetative cover.

Rank IV and V sites have the greatest potential for creative wildlife enhancement landscapes, since these sites in their present state are not used by many species. Rehabilitation efforts should focus on replanting of native species of trees and shrubs which will better serve wildlife needs, be attractive in an urban setting, and meet maintenance objectives. The extensively riprapped shores of the Willamette River are an example of a degraded riparian habitat, which could be greatly enhanced for wildlife and aesthetic purposes.

Map 10 on pages 53 and 54 graphically presents these ranking categories. A Table listing all of the habitat sites by their Rank begins on page 47.

E. Validation of Field Methods

As was the case when the rating system was used in Beaverton, it was decided that resource agency field validation of the rating system was desirable. Representatives from the U.S. Enivironmental Protection Agency, Oregon Department of Fish and Wildlife, and biologists hired to complete a wildlife inventory for the rest of the city accompanied staff from the Audubon Society of Portland into the field to independently score five sites. Separate site visits were conducted with each of the independent raters. Audubon Society of Portland staff scored each site again as a second validation check.

The sites to be validated were chosen in consultation with Bureau of Planning and Audubon Society of Portland staff. The five sites chosen covered a range of different habitat types. The field validation was conducted during November and December 1985, and February 1986. The data sheets used in the validation are included in the second report Lower Willamette River Wildlife Habitat Inventory Data Sheets.

A review of the variations in scoring determined that the differences were within an acceptable range, and that the relative values between each site were similar. The consistency check conducted by Audubon Society of Portland staff was also within acceptable parameters.

F. Application of Rating System to Portland Parks

The following discussion is included as an example of applying the rating system to a study area. The Willamette Greenway inventory included many parks, of which six are included here - Oaks Bottom Wildlife Park, Kelley Point Park, Powers Marine Park, McCarthy Park, Willamette Park, and Tom McCall Waterfront Park. These parks illustrate much of the range of wildlife potential values that can be expected in an inventory, even in designated open space. The overall value each park received is noted beside the park's name. Where a range of values are shown, the park consisted of more than one habitat site, with different overall values.

Oaks Bottom Wildlife Park - (100 to 114)

Oaks Bottom received the highest overall value for all habitat sites within the Greenway. It had the most diversity of water features and plant communities (leading to high food values), with the greatest amount of structural diversity. It also received high values for rarity of habitat, scenic quality, education potential, and fairly high values for flora.

Although it is a city park, there is relatively little physical and human disturbance.

Kelley Point Park - (74 to 87)

A combination of the Columbia Slough, the Willamette River, and an extensive upland cottonwood forest make this a significant site. The park received high values for rarity of habitat, low physical disturbance, scenic quality, and education potential. It received only a fair value for human disturbance, due to the high human use of the park, particularly during the summer. There is not the structural diversity of vegetation here as at Oaks Bottom, with less variety of food, and no other water sources except the Willamette River and Columbia Slough. The park receives fairly high values for interspersion, due to the diversity of habitat types - the Columbia slough, the forested upland, and the meadow.

Powers Marine Park - (68)

The park ranks highest of the landscaped parks, principally due to the natural shoreline, the greater amount of native vegetation, and the moderate to good diversity of species. The open landscaped nature of much of the uplands led to lower values for cover and food, and low values for physical and human disturbance (the park receives high summer use and is subjected to considerable highway noise). Although rating high scenic quality values, the site did not rate high for rarity of habitat and education potential.

McCarthy Park - (40-44)

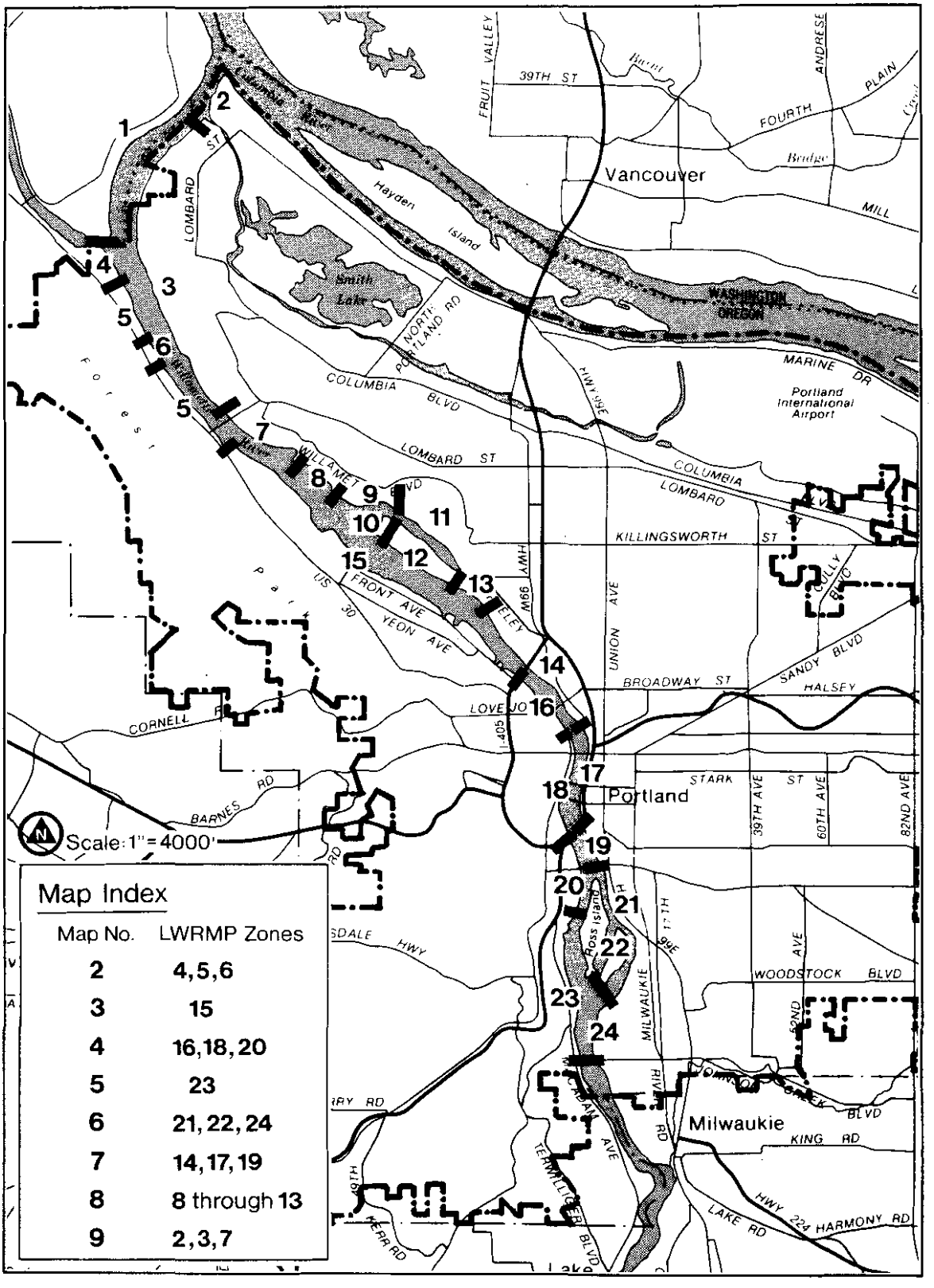
McCarthy park on Swan Island is open to the public year round. The park is completely landscaped, with a fair amount of low ground cover, a few trees, and an area planted with natural grasses. Located on the Willamette river, it received fairly good values for water and food, but does not have a good structural diversity. It is highly altered and so received low values for physical disturbance, but has a relatively low amount of ongoing human disturbance.

Willamette Park - (21 - 23)

Willamette Park consists primarily of large expanses of grassed areas, with a scattering of trees, particularly at the southern end. The park has no other water sources apart from the Willamette River, and has no cover along most of the shoreline. There is also very little food. The park receives high human useage and is very physically disturbed.

Tom McCall Waterfront Park - (5 - 17)

Tom McCall Waterfront Park consists of large grassed expanses with a few scattered exotic trees (ie. not native). The riverfront is almost entirely seawall. The park receives 14 of its 17 points due to its location on the Willamette River. It receives the remainder of its value from a low amount of food available on site.



1 Study Area

March, 1986
Bureau of Planning
Portland, Oregon

Lower Willamette River Wildlife Habitat Inventory

II. WILDLIFE HABITAT INVENTORY

The inventory results are discussed below. For ease of discussion, the Lower Willamette River Management Plan (LWRMP) geographic zones have been grouped together into segments of similar length. Within each segment, the Rank I, II, and III habitat sites are identified and discussed in detail, noting the topography, existing vegetation, observed wildlife, and general land use comments. The remainder of the segment (the Rank IV and V sites) are grouped together and a general discription given.

The discussion begins in the upper Northwest corner, proceeding upstream to the southern limits of the City of Portland, crossing to the east side and proceeding downstream to the confluence of the Willamette and Columbia rivers.

The location of these segments is shown on Map 1. Maps 2-9 show the location of the individual habitat sites within each segment. A summary by Ranking categories is shown on Map 10. Figure 2 at the end of this Section lists each of the habitat sites, including the overall value and a brief discription of the location of the site.

A. Zones 4, 5, & 6

The first stretch of the river consists of the Lower Willamette River Management Plan's zones 4, 5, and 6, from Sauvie Island to just beyond the St. John's Bridge. Part of zone 4 is located outside city limits. It was inventoried due to the possibility of the area being annexed.

Site No.	Value	Site No.	Value
4.1 A *	20	5.2 A	28
4.1 B *	40	5.2 B	0
4.1 C *	20	5.3 A	35
4.1 D *	58	5.3 B	6
4.2 A	95	5.4 A	16
4.2 B	53	5.4 B	7
4.2 C	3	5.4 C	41
4.2 D	91	5.4 D	16
4.2 E	70	5.5 A	16
		5.5 B	9
5.1 A	34		
5.1 B	8	6 A	88
5.1 C	64	6 B	31
5.1 D	46		

* - The Site is located outside the Greenway Boundary.

Rank I Sites

There is only one Rank I site within this segment, located at the Harborton property, presently owned by Portland General Electric. The site consists of an upland riparian forest with forested wetlands (4.2A), and a riparian forested shoreline with a freshwater marsh and mudflats (4.2D). The site is relatively undisturbed, although there has been some fill along the northwest edge, adjacent to the Gay Marina.

The vegetation is diverse, both in species and structurally. The uplands consists of typical riparian vegetation, predominantly black cottonwood, with some Oregon white ash, big leaf maple, Oregon white alder, and Oregon white oak. The understory is predominantly common snowberry and Himalayan blackberry, with some reed canarygrass and sedge species. It is the largest stand of riparian forest within the northern half of the Greenway.

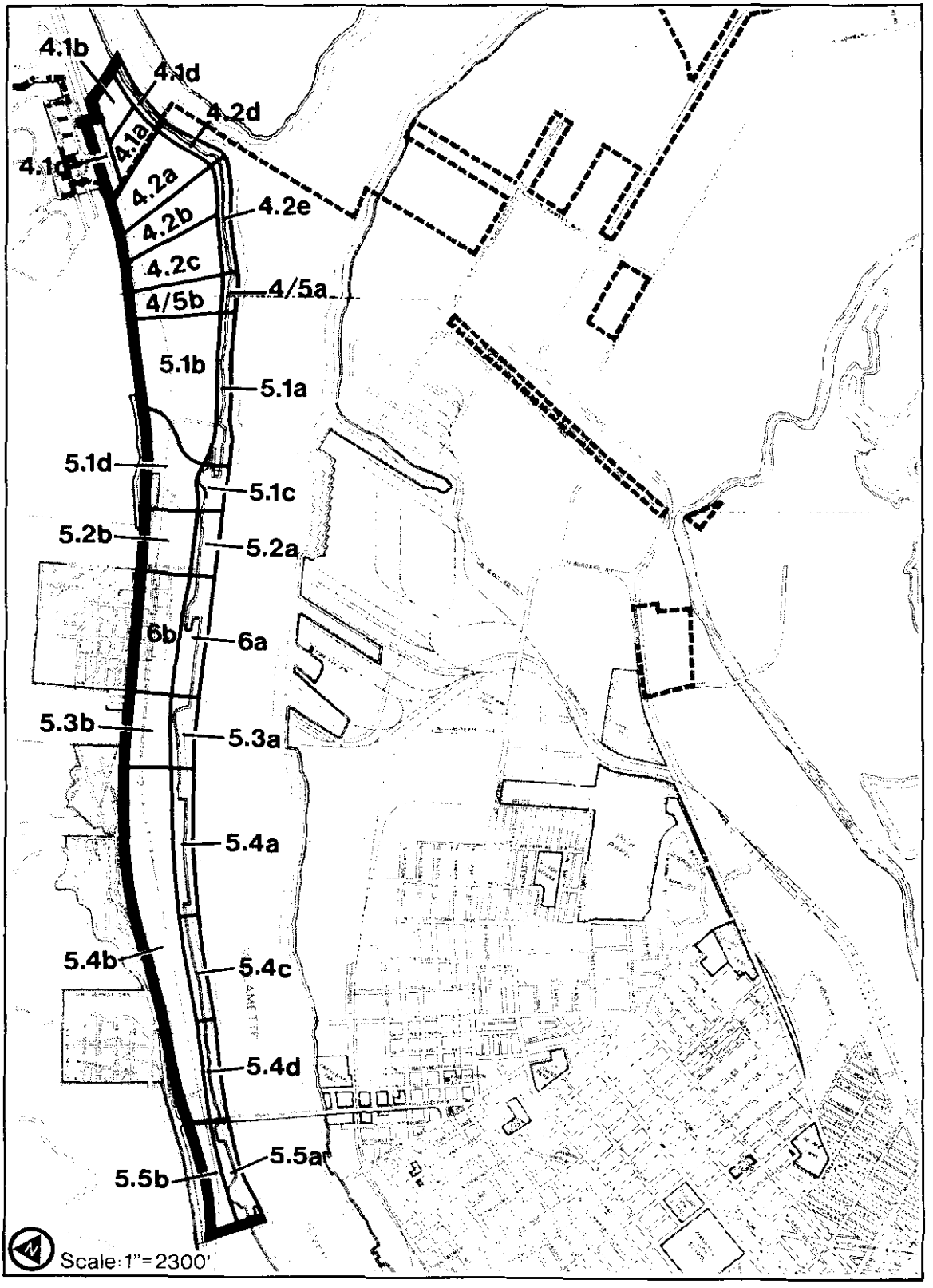
The shoreline is a freshwater marsh with mud flats, and includes a variety of species, including reed canarygrass, willow species, cattail, slough grass, sedge species, hairgrass species, duckweed, water milfoil, and green algae species. The shoreline is natural, with a gently sloping bank. Several log boom rafts are anchored along the bank, providing cover and perches for many species of wildlife.

This site comes the closest to Oaks Bottom in terms of variety of species and is actually less disturbed. The only disturbed portion is a fill site adjacent to the Gay Marina.

A variety of mammals have been observed on the site in the past, including deer, beaver, raccoon, rabbit, opossum, chipmunk, meadow vole, deer mouse, and shrew. Birds known to use the site include Red-tailed Hawk, Pintails, Mallard, Red-shafted Flicker, Steller's Jay, Oregon Junko, Rufous-sided Towhee, Purple Martin, Robin, Black-capped Chickadee, Common Crow, Tree Sparrow, Song Sparrow, Golden-crowned Sparrow, Fox Sparrow, House Wren, Winter Wren, and Violet-green Swallow.

Rank II Sites

There are two Rank II sites along this stretch of the river. The higher Ranked site is the shoreline along the Linnton townsite (6A). The riverbank consists primarily of a sandy beach with large exposed mudflats, interspersed with rocky segments. There is a large stream flowing into the river, over the rocky portion. The mudflats offer good shorebird habitat.



Zones 4,5 and 6

March, 1986
Bureau of Planning
Portland, Oregon

Lower Willamette River Wildlife Habitat Inventory

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This is an excellent riparian zone, consisting of black cottonwood, alder, willow, and maple. Undergrowth consists of scotch broom. This site received a high rating for rarity of habitat, with the upstream segment receiving a higher rating.

The second Rank II site (4.2E) consists of the shoreline adjacent to the cleared sections of Portland General Electric's Harborton site. The vegetation is emergent wetlands, consisting of Wapato, rushes, and sedges. There are good exposed mudflats, with natural low banks. This site is one of only three sites along the Greenway where Wapato was noted, and so received a high flora value. The other two sites were Swan Island lagoon (11.4) and Oaks Bottom (21.1A and 21.1B).

Rank III Sites

There are seven Rank III sites. The site with the highest value was the shoreline adjacent to and including the marina (4.1D). There are good remnants of riparian vegetation along here.

The next site is the vacant portion of the Harborton upland (4.2B). The site has a remnant wetland, but is not forested and recorded a lower value for wildlife than the adjacent forested areas, but a higher value than the developed portion of Harborton (4.2C).

The third site is the transmission line right-of-way adjacent to the Harborton site (4/5A&B). Both the riverbank and upland are included. Although the area has been dramatically impacted by the transmission lines and associated clearing of the land, there is a substantial amount of shrubby vegetation that has wildlife value. There are wetlands present on the site, resulting in the higher wetland value. The shoreline consists of a sandy beach with exposed mudflats, and a low natural bank. There is a dolphin out in the river for ships tieing up offshore waiting to use the sawmill on the adjacent property. A stand of large willow and black cottonwoods exists along much of the shoreline, extending back into the upland a short distance.

The next site is the shoreline and uplands immediately downstream from the Gateau tank farm (5.1C&D). The upland (5.1D) was the former site for a sawmill, and is extremely disturbed. There is also some residential development, and an active sawmill in the southwest portion of the site. The northern half of the site consists of numerous weedy species, including Himalayan blackberries, scotch broom, and wild sweet pea. There were numerous birds using the area, such as Northern Orioles, Violet-green, Cliff and Barn Swallows, Brown-headed Cowbird, Rufous-sided Towhee, and White-crowned and Song Sparrows. There is a ditch with associated wetlands in the northwest corner, consisting of spirea, reed canarygrass, and willows. Even though the site is highly disturbed, the presence of shrubs and trees on the site make this a good wildlife habitat. The site has a relatively high value for rarity of habitat, due to the high disturbance of surrounding sites.

The shoreline (5.1C) consists of a broad sandy beach, gradually narrowing on the upstream portion of the site. There are extensive mudflats below the beach, with remnant pilings, particularly on the upstream portion. Willows, cottonwoods, and blackberries extend down to the beach. This is good riparian habitat, with potential for further development. Beach access is available via an old overgrown road. The shoreline received a value of 2 (out of 4) for rarity of habitat.

The next site is the shoreline in front of Knappton's property approximately half a mile downstream from the St. John's bridge (5.4C). The shoreline is mostly riprapped, with the upstream quarter of the site consisting of a sandy beach and natural gradually-sloped bank. There are some willows and cottonwood scattered along the whole shoreline, with a cluster in the natural portion. The limited vegetative cover on surrounding sites contributed to the overall higher rating for this site.

The final Rank III site in this segment is the upland wetland adjacent to the marina (4.1B). Although highly disturbed, the remnants offer fair food and cover values for wildlife. Great Blue Heron were noted feeding here.

Rank IV and V Sites

The remainder of the uplands in this segment consists of tank farms, the marina parking area, a sawmill, the community of Linnton, and the Corp of Engineers property. Although there is some vegetative cover, the vegetation is scattered and the area highly disturbed. The remainder of the bank tends to be riprapped, with minimal vegetative cover.

B. Zone 15

Zone 15 stretches from the Northwest Natural Gas property just upstream from the St. John's bridge, to Fremont bridge. There are no Rank I sites, two Rank II sites, and four Rank III sites. A site noted in the inventory but located outside the Greenway boundary would receive a Rank I designation if the boundary were moved. This site is discussed at the end of this segment.

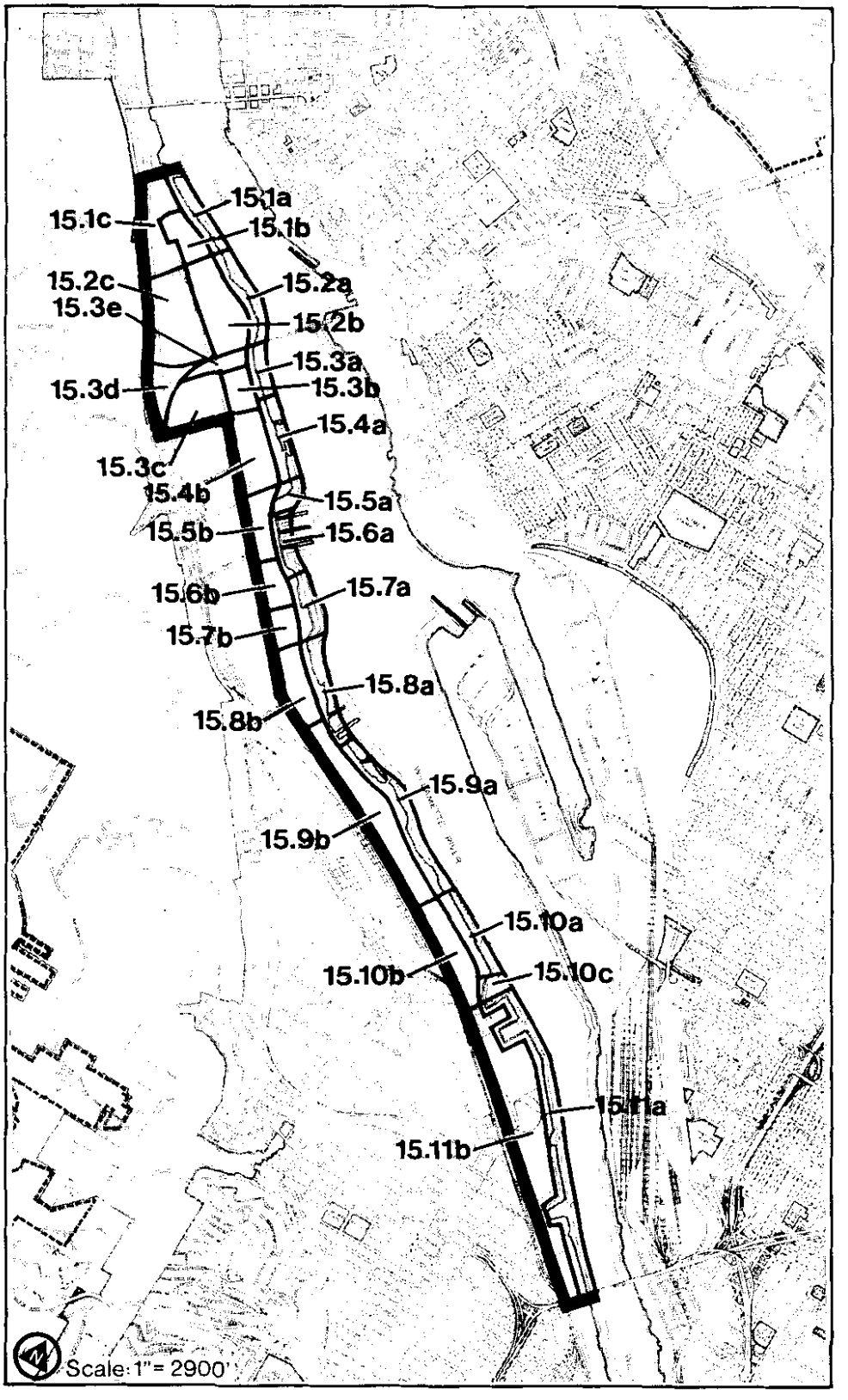
Site No.	Value	Site No.	Value
15.1 A	37	15.6 A	26
15.1 B	52	15.6 B	0
15.1 C	0	15.7 A	27
15.2 A	22	15.7 B	4
15.2 B	62	15.8 A	23
15.2 C *	68	15.8 B	0
15.3 A	80	15.9 A	27
15.3 B	10	15.9 B	4
15.3 C *	15	15.10 A	17
15.3 D *	97	15.10 B	0
15.4 A	27	15.10 C	57
15.4 B	0	15.11 A	16
15.5 A	72	15.11 B	0
15.5 B	0	15.3 E	43

* - The Site is located outside the Greenway Boundary.

Rank II Sites

The highest Rank II site is the shoreline underneath and upstream from the Burlington Northern bridge (15.3A). The shoreline consists of a sandy beach along the upsteam half, with fairly extensive mudflats. There are several streams emptying into the river along here, draining off the remnants of Doane Lake, and the wetlands on the Wacker property. There is a concentration of purple loosestrife and willow around the stream outlets, with well developed stands of reed canarygrass. There is an emergent wetland on the upstream half of the site, consisting of dense reed canarygrass, cottonwood, and willows. The site appears to be a very natural undisturbed area, and receives a high rating for rarity of habitat and scenic qualities. There are several dolphins offshore, used to tie-up log rafts, plus the sawed-off remnants of numerous pilings. The bank is natural with a gradual slope along the wetland area, with the remainder being riprapped, and much steeper.

The second Rank II site (15.5A) is an emergent wetland along the bank just upstream from the Pennwalt Chemical Company property. It is a very broad tidal mudflat, with an emergent wetland surrounding a small stream entering the river via a culvert. There are several trees bordering the wetland. The bank above the mudflat is steep and riprapped. The mudflat is a good shorebird habitat, with numerous gulls and Killdeer. The existing vegetation provides good opportunities for food and cover for the shorebirds. The site ranks high in terms of minimal physical and human disturbance, interspersion, and rarity of habitat. The surrounding uplands are developed for heavy industrial uses, primarily chemical extraction, and oil terminals.



Zone 15

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Rank III Sites

The first Rank III site consists of the upland portion of the Wacker Siltronics property (15.2B&C). Part of the property is developed, and contains the plant, parking lots, and landscaped lawn surrounding the buildings. This portion received low values for wildlife. However, the remainder of the site consists of an open field, containing an emergent wetland, consisting of reed canarygrass and rushes. The field is surrounded on the west side by stands of black cottonwood and willow, with Himalayan blackberry undergrowth, and on the south side by red alder and big-leafed maple. A stream lies beneath the trees, skirting the edge of the field. The remainder of the field consists of weedy species, including many types of grasses, thistles, scotch broom, white sweet clover, teasel Solidago, chickory, queen annes lace, purple loosestrife, willows, and Himalayan blackberry.

The field is used by numerous birds, including Mourning Dove, American Goldfinch, Barn Swallow, European Starling, Common Yellowthroat, Song Sparrow, California Quail, Ring-necked Pheasant, Red-tailed Hawk, Northern Harrier, and Mallard. The wetland receives heavy waterfowl use during the winter months. Employees of Wacker have seen deer and a red fox on the area.

The field was totally disturbed a few years ago when Wacker deposited fill on the entire property, raising it to its present elevation. The vegetation noted above has grown since that time. The existing wetland is the remnant of a much larger wetland which existed prior to the fill.

The description above covers all of 15.2 B & C. In actuality, 15.2C, or the western half of the field, lies outside of the Greenway boundary. It was included in the discussion because the field represents a single habitat area and was treated as such. Much of the wetland discussed above is located in 15.2C.

The second Rank III site(15.10C) is the shoreline adjacent to the City of Portland fireboat station beside Terminal 2. It consists of an emergent wetland of various grasses, and a mudflat, surrounded by a steep riprapped bank, with a few small alders, Douglas fir, willow, and maple growing up through the riprap. There is a stream emptying into the wetland from a culvert. The mudflat is probably used by shorebirds, and swallows were using the trees on the slope. This site receives its rating primarily from the stream, the wetland, its low human disturbance, and the rarity of habitat, flora and scenic quality, in relation to the highly disturbed land around the site.

The third Rank III site (15.1B) is part of the upland on the Northwest Natural Gas property between Wacker Siltronics and the Corp. of Engineers property. This site consists of a field in the

southeast corner of the property. There is a small wetland in one of the overflow containment areas around a storage tank. This wetland consists of cattails, reed canarygrass, and other wetland species. Adjacent to the tank and containment area is a highly physically disturbed roughly graded field, containing three bermed settlement ponds. The edges of the ponds contain rushes and reed canarygrass; the berms are covered with cottonwood, red alder, willow, and cattails. A small stream runs from the containment ponds to the river,with rushes and reed canarygrass growing alongside. The remainder of the field consists of some cottonwood, red alder and willow, Queen Anne's lace, goldenrod,"Circisum", St. John's wort, scotch broom, white sweet clover, "Epilobium angustifolium", and other weedy species. The ground cover is sufficiently dense to attract quail and pheasant. A Great Blue Heron was sighted.

The fourth Rank III site is the upland immediately upstream from the Burlington Northern Railway bridge. The site consists of a long narrow emergent wetland of reed canarygrass, fed by a stream draining the remnants of Doane Lake. The site is significant in that it provides a connection between the remaining portions of Doane Lake and the riverfront.

Rank IV and V Sites

The Rank IV and V sites consist primarily of heavy industrial uses on the upland, and riprapped banks with docks and wharves. Vegetation along here consists of a few scattered trees and shrubs on vacant portions of lots, and some shrubs and grasses growing through the riprap.

The inventory identified a Rank I site south of the Wacker property but outside of the Greenway boundary (15.3D). This property is triangular in shape and is bounded on all sides by a raised railroad embankment. It is a combination of open water, emergent wetlands, and forested wetlands. The site consists of a small lake surrounded by bigleaf maple, black cottonwood, purple loosestrife, Himalayan blackberry, reed canarygrass, rushes, and an extensive cattail marsh. There is heavy waterfowl and nongame use of the site; a Green-backed Heron was also observed. The site has received some of the highest values for water, food, and cover, particularly for diversity, rarity of habitat, scenic quality, and lack of disturbance.

C. Zones 16, 18, & 20

This segment extends from the Fremont bridge to approximately half a mile upstream from the Ross Island bridge, adjacent to the Spagetti Factory. There are no Rank I, II, or III sites, and only three Rank IV sites.

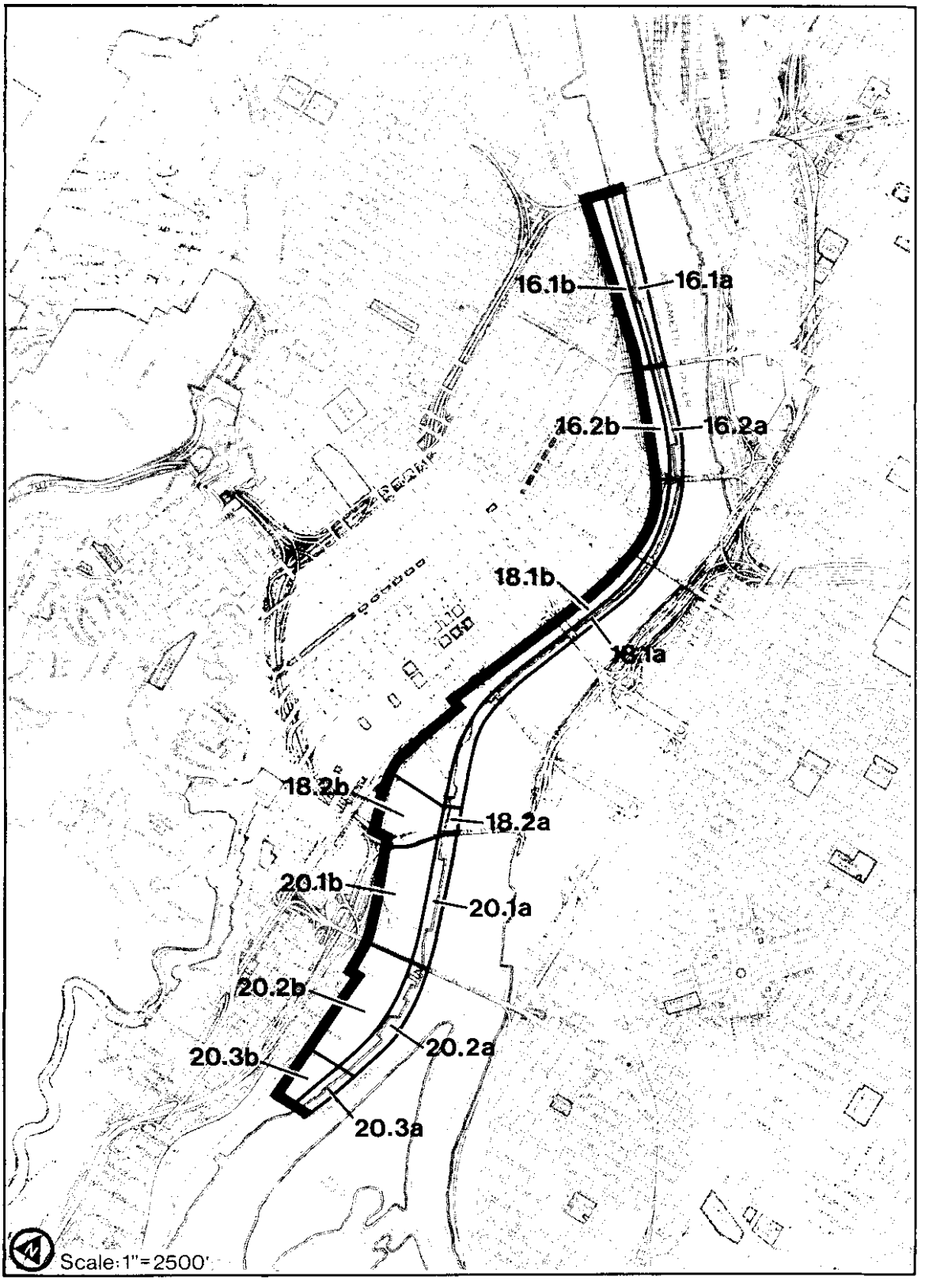
Site No.	Value	Site No.	Value
16.1 A	19	18.2 A	38
16.1 B	0	18.2 B	22
16.2 A	32	20.1 A	20
16.2 B	0	20.1 B	0
18.1 A	19	20.2 A	30
18.1 B	5	20.2 B	8
		20.3 A	20
		20.3 B	0

Rank IV Sites

The highest Rank IV site is the riverbank at the McCormick Pier condominiums (16.2A), which receives its value due to the vegetative plantings along the riprapped embankment.

The second Rank IV site is a small piece of shoreline in front of the PP&L power plant (18.2A). Although steeply sloping, the embankment is not heavily riprapped, and covered with Himalayan blackberry, some Lombardy poplar, black cottonwood, willow, grasses, and other weedy species. There is a small sandy beach below the bank, with exposed mudflats. Several outfalls enter the river at this point.

The third Rank IV site (20.2A) consists of a small section of shoreline upstream from the Zidell property. Although the bank is covered with pieces of cement, asphalt, and rock, there is still a modest amount of vegetation, consisting of Himalayan blackberry, Queen Annes lace, "Tanacetafolium", and a few young black cottonwoods. The top of the bank has a fair number of black cottonwood and black locust trees, with an undergrowth of "Tanacetafolium", scotch broom, Himalayan blackberry, Queen Anne's lace, several parsley family members, sweet clover, and grasses.



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Rank V Sites

The remainder of this segment of the river consists of Rank V sites, including the Tom McCall Waterfront Park, the Riverplace complex, and several heavy industrial uses. The bank is either heavily riprapped, with docks, or a seawall. Although the park is open space, most of the park is grassed with a modest scattering of exotic (non-native) trees. The lack of cover and the high human usage the park receives resulted in its low value to wildlife.

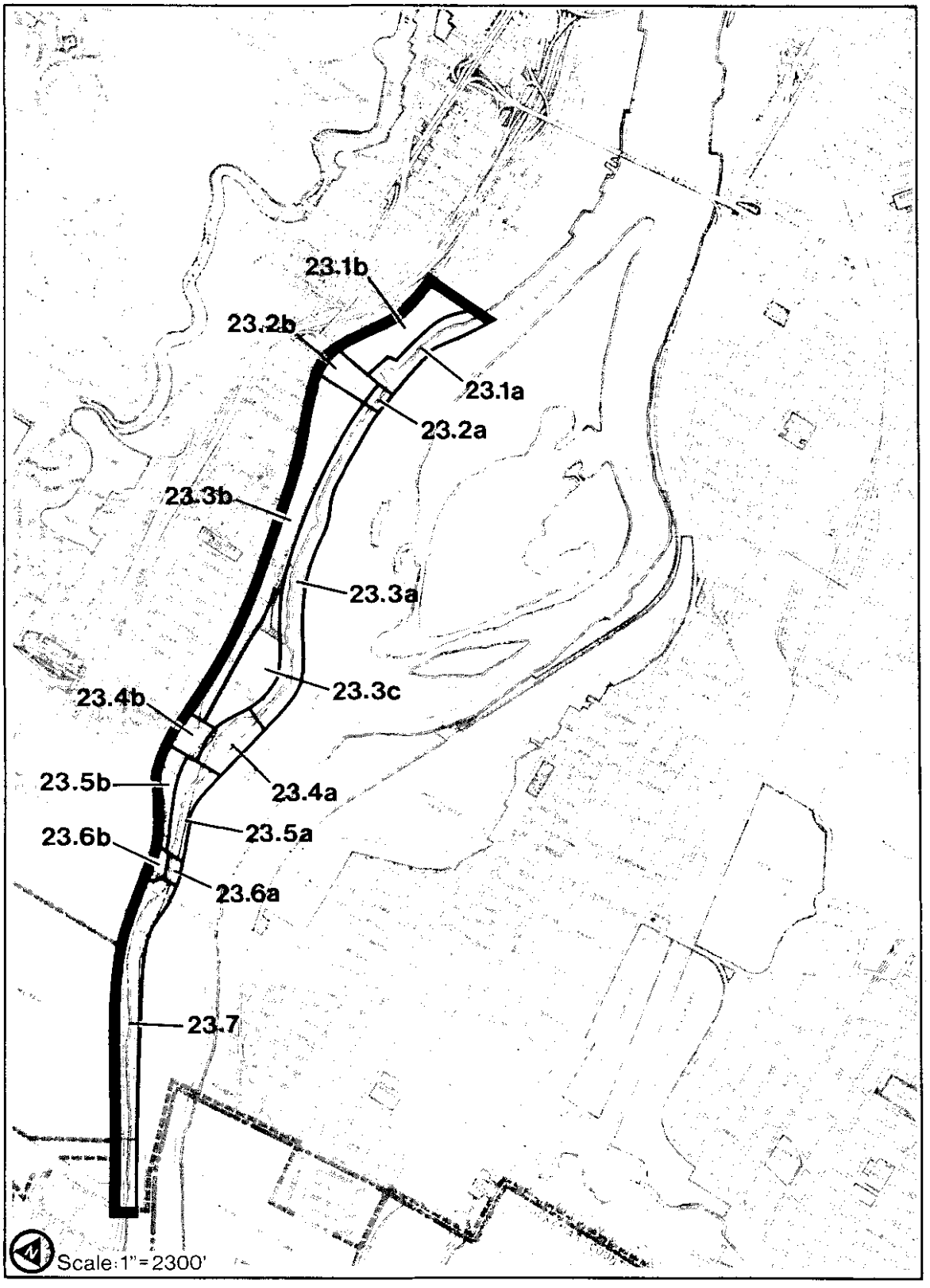
D. Zone 23

Zone 23 stretches from the Spagetti Factory to the southern boundary of the City. Although there are no Rank I sites, there are three Rank II sites, and one Rank III site.

Site No.	Value	Site No.	Value
23.1 A	23	23.4 A	87
23.1 B	8	23.4 B	13
23.2 A	72	23.5 A	82
23.2 B	8	23.5 B	31
23.3 A	22	23.6 A	35
23.3 B	3	23.6 B	10
23.3 C	23	23.7	67

Rank II Sites

The first Rank II site (23.4A) is the shoreline upstream from Willamette Park, opposite Miles Place residential area. It consists of a small beach area, with extensive mudflats, giving way upstream to a wetland in front of the residences. Several small docks extend out through the wetland. The bank is gently sloped and unriprapped, covered with vegetation along much of the length, including an abundance of black cottonwoods and willows, with some Oregon white oak and elm. A stream enters the river along here. The mudflat is heavily used by shorebirds, Great Blue Heron, gulls, and Crows. The mudflat is observable from Willamette Park. The site received high values for diversity, cover, rarity of habitat, and scenic quality.



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The second Rank II site (23.5A) is the shoreline and uplands immediately upsteam from 23.4A, and includes a houseboat moorage and newly constructed marina, but stops short of the Staff Jennings Marina. There are large exposed mudflats and wetlands along much of the shoreline, cut by at least one large stream. The bank is gently sloping, with herbaceous vegetation extending down to the mudflats, including reed canarygrass, rushes, willow herb, Tuncus sp., daisies, several species of willow, St. John's wort, "Tanacetafolium", "Veronica", thistles, Polygonum, deadly nightshade, "Mimulus guttatus", mint, some purple loosestrife and "Verbascum thapsus". The upland along here is primarily a densely forested wetland of black cottonwood and willow. Although rating fairly high for most water, cover, and food values, the site is impacted by the houseboat moorage, the new marina, and associated parking and storage areas.

The third Rank II site (23.2A) is the mudflat, emergent wetland and riparian habitat between Tequilla Willie's restaurant and the Johns Landing condominiums. Relatively undisturbed, the wetland consists primarily of reed canarygrass, giving way to black cottonwood and willow, with Himalayan blackberry and some hardtack and scotch broom around the edge. Two outfalls empty into the river at each end. The bank around the wetland is steep and riprapped, with some Himalayan blackberry and scotch broom. The site rated fairly high values for diversity, cover, rarity of habitat, scenic qualities, and low physical disturbance. The site is also considered to have educational value, in terms of it being the only example in the immediate area of a semi-natural riverbottom habitat, the wildlife observable here, and the view the site offers of the heron rookery on Ross Island.

Rank III Sites

The only Rank III site in this stretch is Powers Marine Park (23.7), located between Sellwood bridge and the southern City limits. Starting at the northern edge of the park and heading upstream, the vegetation initially is young black cottonwood, Douglas fir, bigleaf maple, Oregon ash, with an understory of Himalayan blackberry, oceanspray, snowberry, Queen Anne's lace, hawthorne, dogwood tree, willow herb, Rumex, sweetpea, horsetail, clematis, willow, and serviceberry. The vegetation extends to the edge of the bank, falling steeply 4 or 5 feet to a narrow rocky beach. A narrow gravel road leads into the park. There are at least two large streams along this portion of the park, which is undeveloped and narrow, perhaps only 150 feet wide at this point. After a few hundred feet the park narrows to about 60 feet on the uplands, which consists of mowed grass with Oregon white oak, Douglas fir, ash, bigleaf maple, black cottonwood, and western red cedar scattered throughout.

The shoreline widens into a wetland, consisting of reed canarygrass, black cottonwood, and willow, with a steep natural bank behind, covered with red alder, hawthorne, Douglas fir, black cottonwood, willow, white ash, and bigleaf maple. A large stream entering the river has formed a delta wetland 50 to 60 feet deep. The gravel beach widens beyond the delta, turning eventually into a sandy beach with exposed mudflats, bordered with grasses and reed canarygrass. The bank vegetation is similar to that described above.

The only wildlife noted were some Common Bushtit, Black-capped Chickadee, and Robin. Although the park rates fairly well in terms of cover and diversity, it is heavily impacted by the road noise from Macadam Blvd. which parallels the park. It is primarily due to this road noise and high human usage that the park receives as low a rating as it does. The park does rate high in terms of scenic quality, both for the shoreline itself, and the view along and across the river.

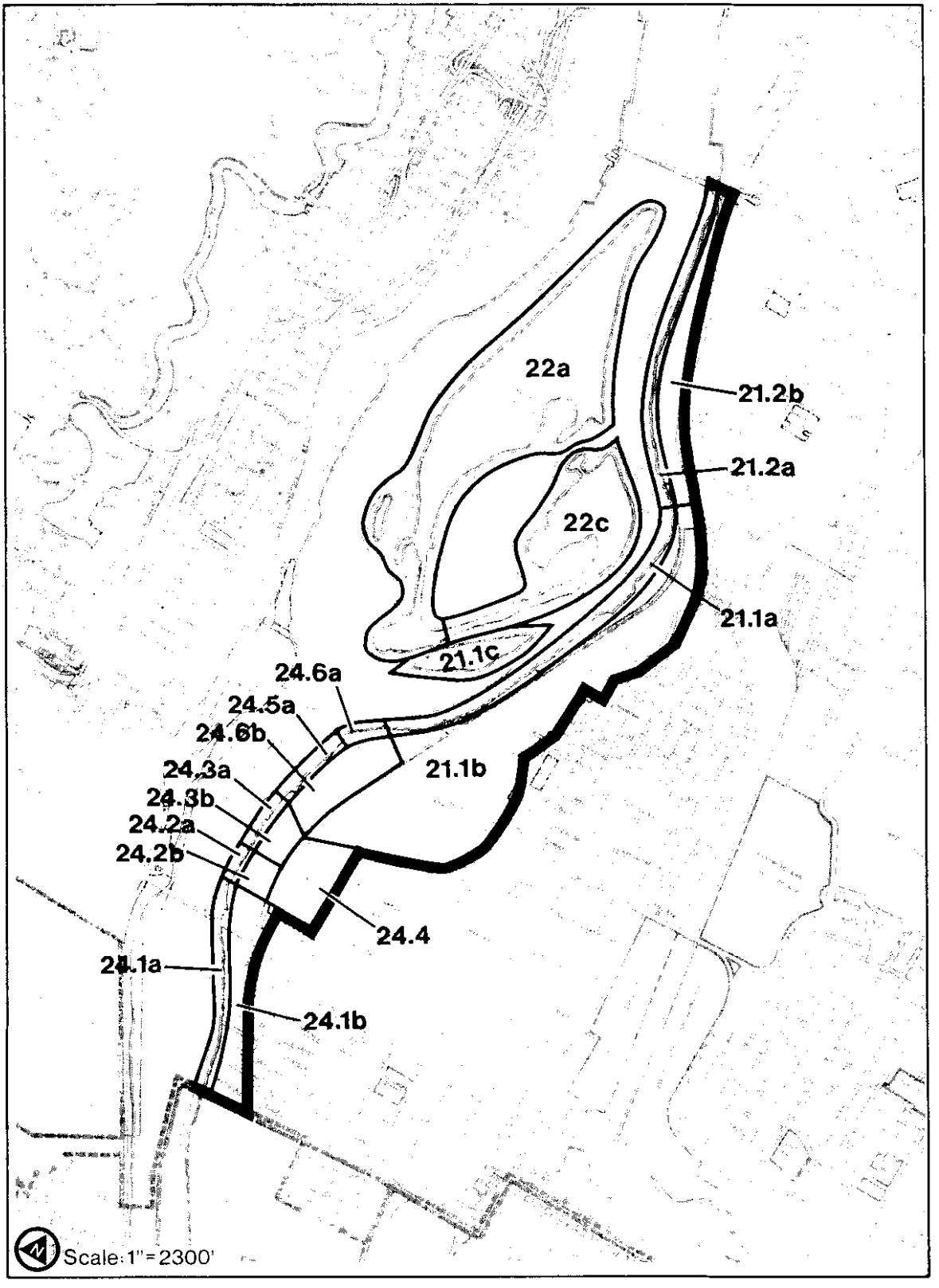
Rank IV and V Sites

The remainder of Section 23 is either Rank IV or V. The uplands consist of a mixture of office, commercial, and residential, with a large portion being Willamette Park. Many of the properties are landscaped, with expanses of grass, a few scattered trees, and shrubs. The shoreline is primarily riprapped, with little vegetation.

E. Zones 24, 22, & 21

Zone 24 extends from the southern City limit on the east bank up to the end of Oaks Amusement Park. Zone 22 is composed of Ross Island, Hardtack Island, East Island, and Toe Island. Zone 21 includes all of Oaks Bottom, continuing downstream to Ross Island bridge.

Site No.	Value	Site No.	Value
24.1 A	26	24.6 B	25
24.1 B	17	22 A	95
24.2 A	83	22 B	76
24.2 B	15	22 C	65
24.3 A	83	21.1 A	101
24.3 B	82	21.1 B	114
24.4	41	21.1 C	98
24.5 A	83	21.2 A	38
24.6 A	71	21.2 B	16



Zones 21, 22 and 24

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Rank I Sites

There are four Rank I sites along this stretch of the river, two being Oaks Bottom upland and shoreline, and the remaining two Ross Island, Toe Island, East Island, and the southern portion of Hardtack Island.

Oaks Bottom (21.1A &B) received the highest wildlife values of all the properties within the Willamette Greenway. Oaks Bottom has six identifiable habitats:

Upland Mixed Forest - the slopes of the bluff running along the eastern boundary of the Bottom, consisting of Douglas fir, Oregon white oak, bigleaf maple, black locust, snowberry, blackberry species, Indian plum, elderberry, poison oak, ocean spray, serviceberry, English ivy, clematis, lilies, herbs, and other species.

The North Fill - the former Drake Co. property, filled with material from the stadium freeway. Formerly a wetland, it now consists of a mixture of wetlands and uplands, with a number of natural ponds with connecting channels. The larger pond is colonized by emergent wetland plants around the perimeter. The upland plants consist primarily of wild sweet pea, some scotch broom, and Himalayan blackberry. California Quail and Ring-necked Pheasant use this habitat.

Riparian Forest - Shoreline between Oaks Amusement Park and the North fill. The bank is very steep, with vegetation to the edge of the bank. The vegetation consists primarily of black cottonwood, Oregon white ash, willow species, with an understory of red and blue elderberry, creek dogwood, Himalayan blackberry, nettles, snowberry and horsetail. Log rafts are often anchored off the bank, and are frequently used by fishermen.

Freshwater Marsh - an emergent wetland south of the north fill. It is dominated by reed canarygrass, with scattered dead willows, rushes and sedges. The willows are important nesting and perching habitat for birds of prey and cavity nesting species. Several ponds have been developed to help control the mosquito population.

Freshwater Swamp - a true swamp, located south of the freshwater marsh. This wetland is dominated by willows and reed canarygrass, interspersed with sedge, knotweed, purple loosestrife, rushes, and small populations of Wapato. This area is heavily used by Great Blue and Green-backed Heron and waterfowl, including Common Merganser, Eurasian and American Wigeon, Green-winged and Cinnamon Teal, Mallard, Coot, Northern Pintail, Northern Shoveler, Gadwall, Ring-necked Duck, and Lesser Scaup.

South Fill - an open grass habitat along the southern edge of Oaks Bottom. Formerly a wetland, the area was used as a landfill in the early 1960's. A thin layer of soil supporting only grasses and weedy species, with little structural diversity, now covers the fill. Wildlife using the field include swallows, California Quail and Ring-necked Pleasant.

Oaks Bottom received high values for all classifications of water, food, and cover, and high values for wildlife, flora, scenic qualities, rarity of habitat, educational potential, interspersion, and low disturbance. It is the variety of communities within Oaks Bottom which contribute to the high overall values the site receives. More than 120 species of birds, plus numerous mammals, herptiles, and invertebrates, have been observed in Oaks Bottom. It is an important resting site for many species of migratory birds, as are Ross Island and East Island.

The remaining Rank I area is composed of Ross Island, Toe Island, and the southern portion of Hardtack Island (22A), and East Island (21.1C). The islands and Oaks Bottom form a close-knit ecological unit, with a significant crossover of birds and animals. Typical of these are the Great Blue Heron, which nest atop the black cottonwoods on Ross Island and feed on the carp and other fish found in Oaks Bottom. The heron rookery is the largest within the City limits.

Ross Island is essentially natural in character, with natural beaches, low gradual banks around the perimeter and steeper banks inside the lagoon. There is heavy vegetative cover on the uplands, primarily black cottonwood with some Oregon white ash. Areas physically disturbed are covered with Himalayan blackberry. There are some Oregon white oak, typically a dry site species, on the northern tip of the island. The most significant feature on Ross Island from a wildlife perspective is the Great Blue Heron rookery, with approximately 40 nests. Red-tailed Hawk and Great Horned Owl also nest here. Belted Kingfisher utilize the steep banks around the lagoon for nesting.

East Island is the least disturbed of the islands. It supports a dense understory of typical riparian vegetation, and is used by the same species which can be found at Oaks Bottom and on Ross Island. The shallow channel between East Island and Hardtack Island is used by waterfowl and shorebirds. Spotted Sandpiper can be seen in large numbers in this channel.

Hardtack Island is the most disturbed of the islands. Ross Island Sand & Gravel have dredging facilities here on the northern end of the island. There has been some revegetation work done on those areas which have been dredged. Humans use portions of the island for camping during the warmer months. The southern portion of the island is less physically disturbed, although the shoreline receives a fair amount of use during the summer.

Toe Island has less wildlife value than the Ross or East islands due to its small size. It is in a natural state, and is heavily used by numerous species of gulls, and at some times of the year, many Double-crested Cormorant.

Similar to Oaks Bottom, the islands receive high value ratings for wildlife, scenic qualities, rarity of habitat, educational potential, high interspersion, and low physical and human disturbance on the uplands. It should be noted that the portion of Hardtack Island where the sand and gravel operations are located has been excluded from 22A. There is some disturbance on Ross Island and Hardtack Island due to the gravel extraction in Ross Island lagoon.

Rank II Sites

There are five Rank II sites within this stretch of the river. Four of these are the riverfront from Sellwood bridge downstream to the end of the Oregon Yacht Club, while the fifth is the uplands portion of the PGE property. For discussion purposes, the waterfront is discussed as one unit.

The shoreline is primarily sandy beach, with occasional stretches of gravel. Exposed mudflats with sawed-off pilings extend along much of the beach. The beach starts out fairly narrow at Spokane Street, widening to approximately fifty feet in front of Oaks Amusement Park. There is a large expanse of wetland at this point, consisting primarily of reed canarygrass and small willow. The beach narrows and becomes rocky prior to the Oregon Yacht Club. The shoreline opposite the houseboats consists of a steep natural bank perhaps ten feet in height with little vegetation.

The bank is low and natural at Spokane St., rising gently to Oaks Amusement Park, where it is approximately 15 feet in elevation from the beach, with a containment wall and promenade. Beyond Oaks Amusement Park, the bank remains steep and natural, perhaps ten feet in height, with little vegetation. Roots from the trees on the bank above lie exposed along here. The bank itself contains numerous burrow holes, past quarters for beaver and muskrat which live along here.

Vegetation along the bank varies from mowed grass and scattered trees at Sellwood Riverfront Park, a classic riparian bank of black cottonwood, willow, Oregon white ash, box elder, and reed canarygrass on the PGE property, an open promenade area along Oaks Amusement Park with some grassed areas and scattered oak trees, and back to black cottonwood, Oregon white ash, willow species, with an understory of red and blue elderberry, creek dogwood, Himalayan blackberry, nettles, snowberry and horsetail opposite the houseboat moorage.

The remaining Rank II site is the upland portion of the PGE property. The upland consists of a fairly dense coverage of black cottonwood, willow, Oregon white oak and ash, and box elder, with Himalayan blackberry, clematis, grasses, and weedy species in the clearing around the transmission towers, and scattered throughout. There are several spots where the ground is quite moist, with reed canarygrass, willow, and black cottonwood. The property is disected by a number of trails. Numerous birds, including Song Sparrow, Bewick's Wren, and American Goldfinch were observed.

Rank III Sites

There are two Rank III sites. The first is the remainder of Hardtack Island, which contains the operational equipment of the Ross Island Sand and Gravel Company, plus an area which is being revegetated. The eastern shoreline and immediate upland is still relatively undisturbed, with natural beaches and a gradually sloped bank. The vegetation consists primarily of black cottonwood, willow, with some Oregon white ash. Himalayan blackberry is also prevalent. The beach receives a fair amount of human use during the summer, particularly by canoeists and waterskiers.

The second Rank III site is Sellwood Park (24.4). The park consists of large grassed areas, with a number of mature trees throughout and around the perimeter, particularly on the western edge and slope. The park has a fair value for cover and food, but does not have any water resources. The site rates fairly high values for scenic quality, both for the park itself and the view it offers of Oaks Bottom, Ross Island, and the river.

Rank IV and V Sites

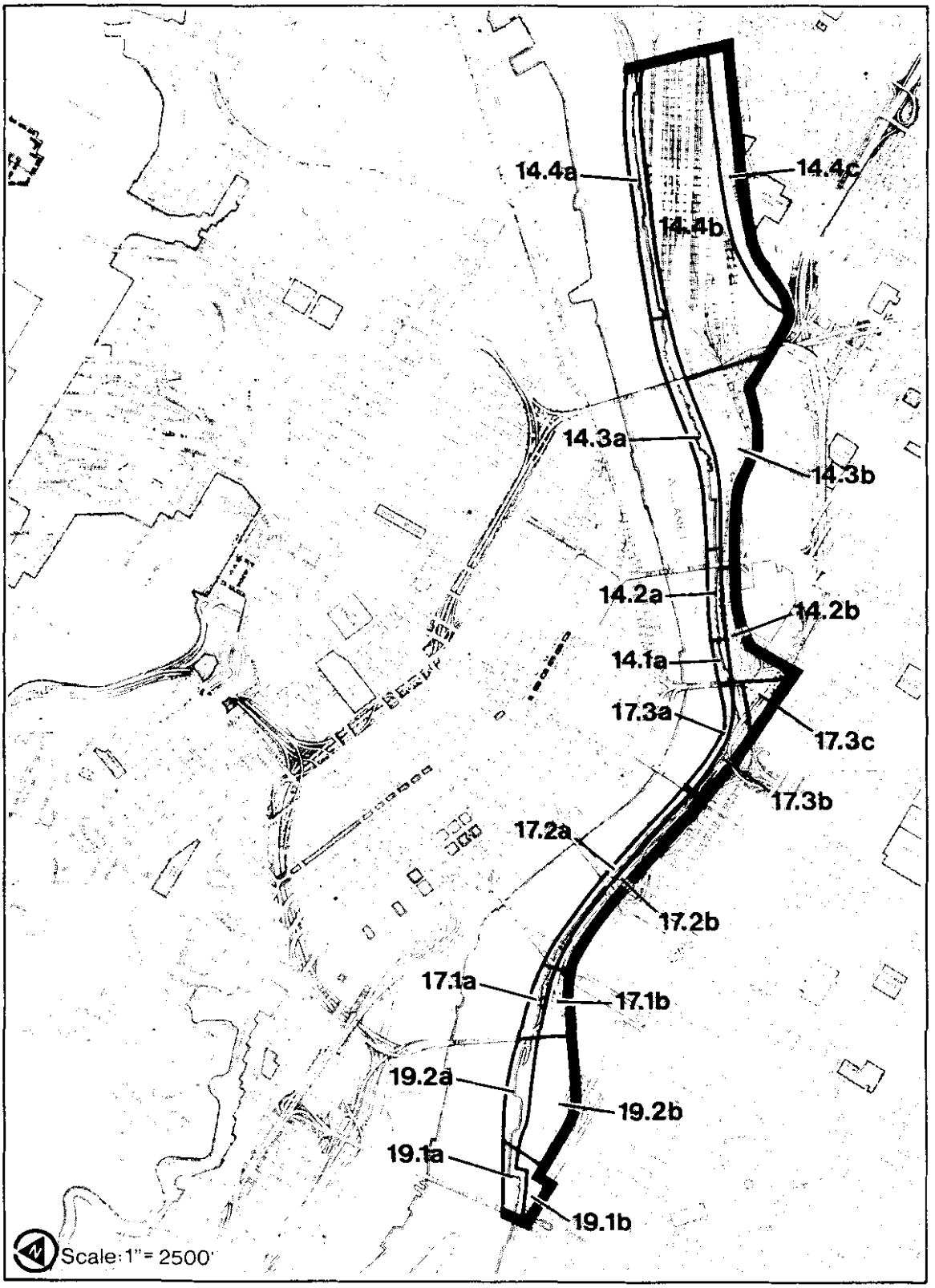
The remainder of this stretch consists of Oaks Amusement Park (large paved areas, some grassy areas, scattered oak trees - heavy physical and human disturbance), the shoreline upstream from Sellwood bridge (houseboat moorages and private marinas, no beach), the shoreline and uplands from Oaks Bottom to Ross Island Bridge (narrow rocky beach, narrow terrace with railway line, steep slope up to McLoughlin Blvd, with Himalayan blackberry, blue elderberry, clematis, serviceberry, some Oregon white oak, bigleaf maple, and hazel; heavily disturbed, lots of garbage), and Sellwood Riverfront Park.

Sellwood Riverfront Park was under construction during the inventory, and was void of vegetation except for a few trees. Upon completion, the park will consist of large grassed areas with scattered trees, and a small wetland with a stream to the river. Due to its condition during the inventory, the site ranked low; however, it is anticipated that when completed, the park will probably be rated Rank III.

F. Zones 19, 17 & 14

This segment of the river extends downstream from Ross Island bridge to just short of Swan Island. There are no Rank I or II sites, and only one Rank III site.

Site No.	Value	Site No.	Value
19.1 A	16	17.3 C	22
19.1 B	24	14.1 A	16
19.2 A	30	14.2 A	37
19.2 B	0	14.2 B	11
17.1 A	37	14.3 A	20
17.1 B	0	14.3 B	6
17.2 A	26	14.4 A	23
17.2 B	21	14.4 B	0
17.3 A	21	14.4 C	45
17.3 B	10		



Zones 14, 17 and 19

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Rank III Sites

The single Rank III site is the upland slope between Greeley Ave. and Overlook Park. The northern half of the slope is densely covered with Oregon white ash and oak, bigleaf maple, black cottonwood, Pacific madrone, and a shrubby understory of oceanspray, poison oak, Himalayan blackberry, scotch broom, and clematis. The slope is unstable with several slides visible, with Himalayan blackberry and blue elderberry growing exclusively on the slides. The southern half of the slope is steeper, with fewer trees and more slides evident.

Rank IV and V Sites

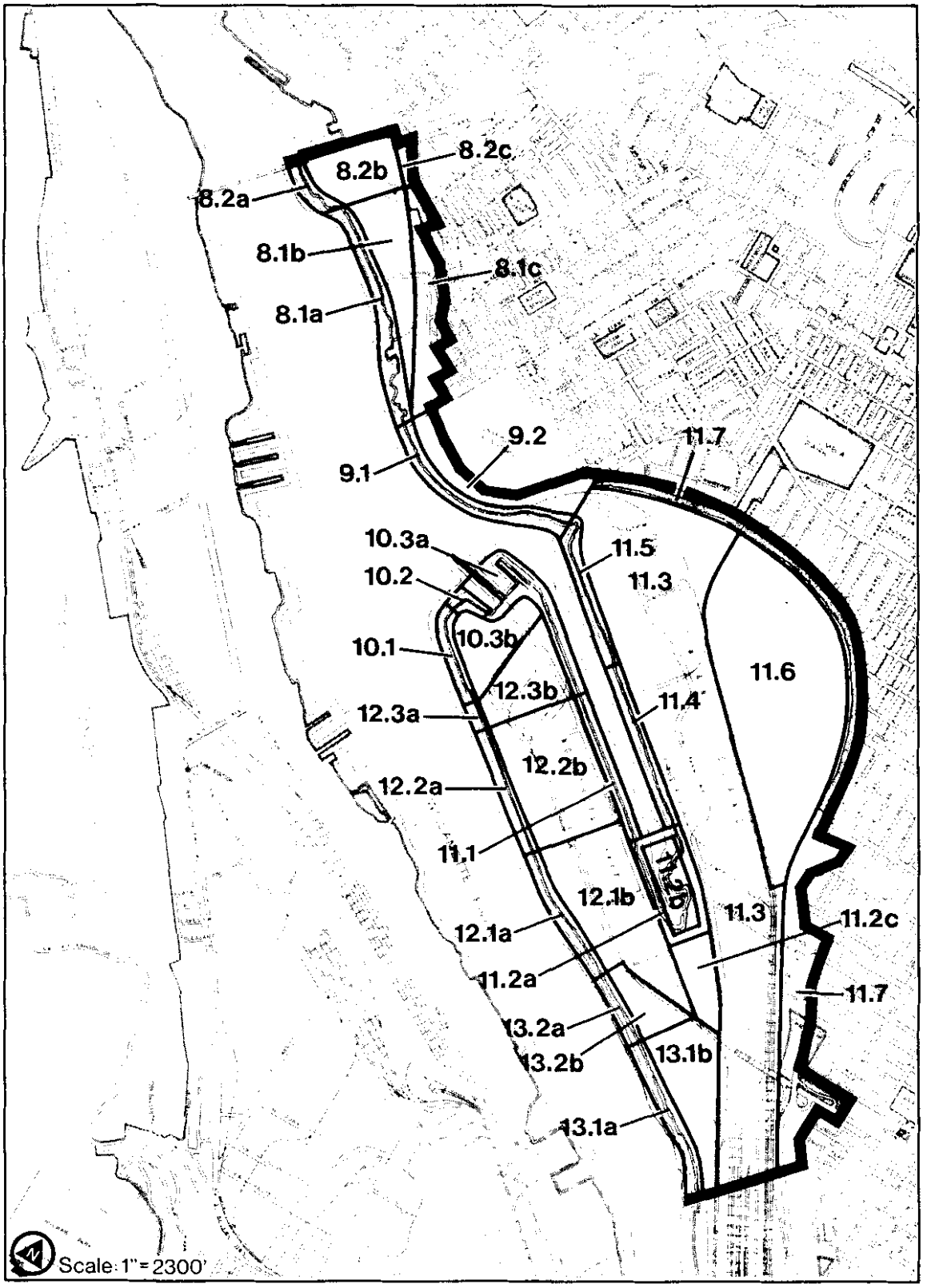
The upland on the remainder of this segment is primarily heavy industrial, with a large railyard, railway, freeway and bridge right-of-ways, and the Eastside Esplanade. The area is very heavily disturbed, with little vegetation.

The shoreline is extensively riprapped, with very few trees and shrubs.

G. Zones 8 Through 13

Zones 8 through 13 stretch from Swan Island downstream to the Burlington Northern Railway bridge. There are no Rank I sites, three Rank II sites, and six Rank III sites.

Site No.	Value	Site No.	Value
13.1 A	31	11.7	72
13.1 B	6		
13.2 A	17	10.1	16
13.2 B	29	10.2	47
		10.3 A	16
12.1 A	44	10.3 B	0
12.1 B	17		
12.3 A	22	9.1	62
		9.2	81
11.1	28		
11.2 A	36	8.1 A	16
11.2 B	21	8.1 B	0
11.2 C	0	8.1 C	42
11.3	0	8.2 A	64
11.4	75	8.2 B	0
11.5	22	8.2 C	23
11.6	25		



Zones 8 through 13

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Rank II Sites

The first Rank II site is the bluff at the University of Portland (9.2). It consists of a steep, heavily vegetated slope, cut by numerous draws. Most of the draws have been disturbed (landslides and dumping), and are almost totally overgrown with Himalayan blackberry. The rest of the slope consists of Douglas fir, cedar, Oregon white oak, black cottonwood, Pacific madrone, vine maple, big leaf maple and a fair number of exotic trees (black locust and others). Song sparrows and warblers were observed.

The slope rates high values for food, cover, low physical and human disturbance, interspersion, flora, scenic qualities, rarity of habitat, and educational potential.

The second Rank II site (11.7) is the remainder of the Mocks Crest slope, from the University of Portland to just beyond Going Street. It is steep and heavily vegetated, primarily with black cottonwood, Oregon white oak, bigleaf maple, and Himalayan blackberry. The blackberry is found typically where sliding has occured. There is a City landfill part way along the slope, covered with black cottonwood, willow, and weedy species.

The third Rank II site (11.4) consists of the lower east shoreline of Swan Island lagoon. The site is composed of Wapato marsh, with associated wetlands and mudflats, interspersed with stretches of sandy beach. There is a inverted u-shaped pier midway along the segment, with several large anchoring cables at regular intervals.

Wapato is extremely rare in Portland, and the assemblage of wetland species at this site is unique. Wetland vegetation includes spike rush, seeps, carices, sedges, smartweed, yellow composites, purple loosestrife, artemisia, reed canarygrass, willow, and black cottonwood. Several sets of raccoon and beaver tracks were noted; there were two Great Blue Heron on the site, painted lady butterfly, and goldfinches.

The bank along the whole segment is a black cottonwood riparian habitat. The bank is not riprapped and fairly dense, with one access road at the north end. There is a fair amount of drainage onto the site, with one large culvert about half way along.

Rank III Sites

The highest Rank III site (8.2A) is a small beach immediately upstream from the Burlington Northern Railway bridge. The beach is broad and sandy, with some rocks and logs. Black cottonwood is

colonizing the beach, with a border of black cottonwood and Himalayan blackberry. The beach provides a view of the riverfront activity at the creosote plant and of the tugboat activity further upstream. The creosote plant activity on the upland is screened by the cottonwoods. Access to the beach is accomplished from under the railway bridge via the property downstream.

The second Rank III site (9.1) is the waterfront below the University of Portland bluff. The shoreline consists of a short steep riprapped bank, covered with Himalayan blackberry and scattered clumps of black cottonwood and willow. A narrow terrace with railway tracks separates the shoreline from the upper slope (9.2).

The third Rank III site (12.2A) consists of a stretch of shoreline midway along Swan Island. The upland is presently being used to assemble modules for Alaska. It consists of a riprapped bank, with a fairly good vegetative cover, including scotch broom, dill, mustards, St. John's wort, and wolly mullein. There is a lot of seed here for wildlife, and fairly dense cover.

The fourth Rank III site (10.2) is a portion of the shoreline on the tip of Swan Island. The shoreline is riprapped, and contains a fair amount of vegetation, including butterfly bush, scotch broom, St.John's wort, mustard, wolly mullein, lathyrys, sonbird seed, white sweet clover, "Epilobium", and "Datura". The shoreline does have a small mud flat and rocky beach, heavily used by gulls and Great Blue Heron.

The fifth Rank III site (12.1A) is located immediately upstream from 12.2A on Swan Island and includes part of McCarthy Park. The shoreline is riprapped, with a narrow strip at the top of the bank which has been planted with a wildflower mixture, including California poppy, evening primrose, mullein, yarrow, plantain, "Rudbeckia", "Erodium", grasses, clover, and Queen Anne's lace. There is a good diversity of feed here. A portion of Greenway Trail separates the narrow strip from a second narrow strip planted with pines, shrubs, and various types of Prunus. Several gulls and Great Blue Heron were observed feeding along the shoreline.

The sixth Rank III site (8.1C) consists of the slope upstream from the University of Portland, above the Western Terminals property. Although a continuation of the slope around the University of Portland, it contains less diversity of species, being composed primarily of Oregon white oak, bigleaf maple, ponderosa pine, and Himalayan blackberry.

Rank IV and V Sites

The remainder of this segment of the river is devoted to heavy and service industrial uses. Some of the lots are landscaped, with large grassed areas and scattered trees. The exposed shoreline is typically riprapped, with occasional black cottonwood and willow trees poking through. The remainder of the shoreline is covered with docks and wharves.

H. Zones 7, 3, & 2

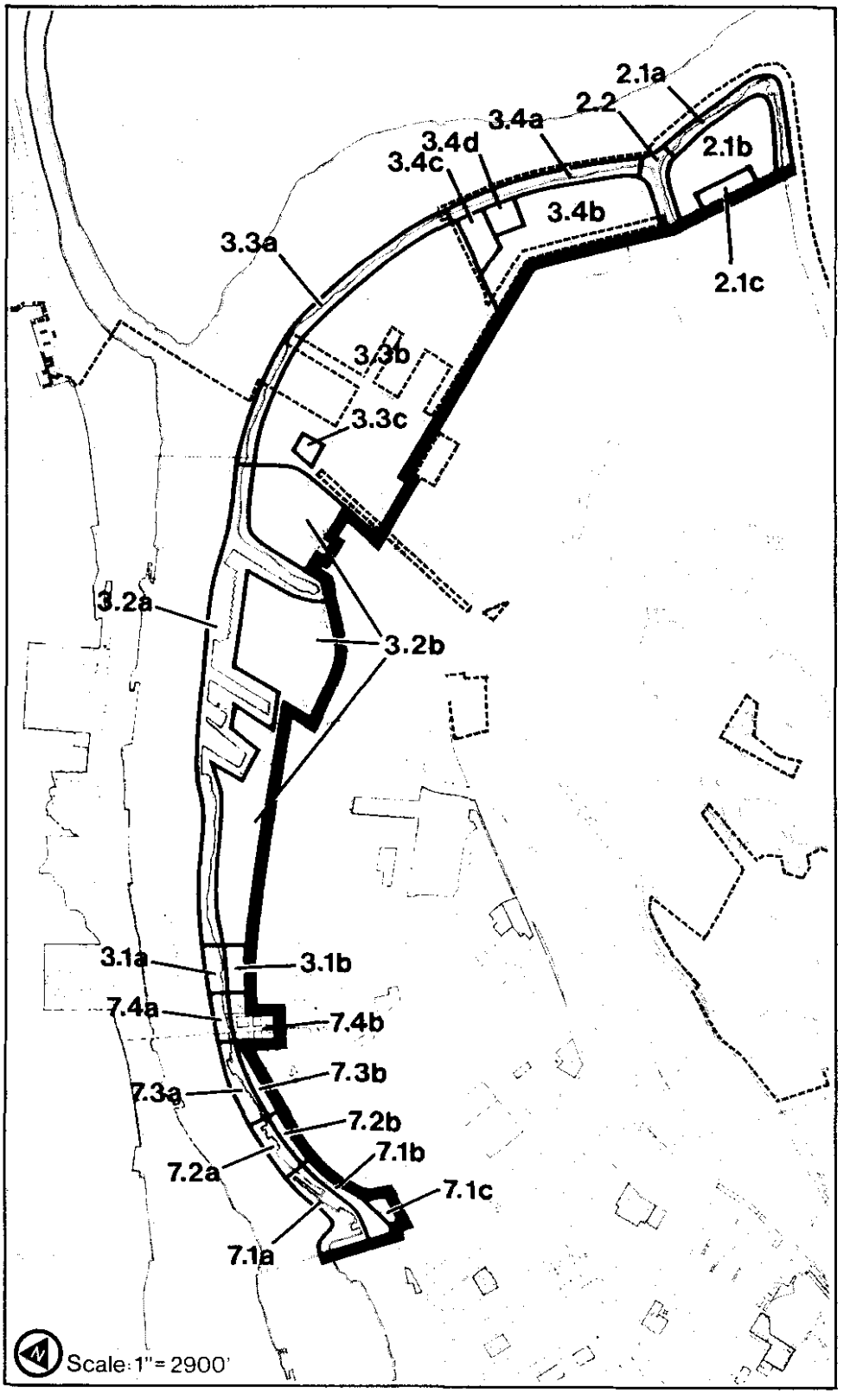
This is the final segment of the inventory, and stretches from the Burlington Northern Railway bridge to the confluence of the Willamette and Columbia rivers. There are no Rank I sites, six Rank II sites, and six Rank III sites.

Site No.	Value	Site No.	Value
7.1A	72	3.2B	0
7.1B	49	3.3A	19
7.1C	70	3.3B	15
7.2A	57	3.3C	30
7.2B	37	3.4A	80
7.3A	44	3.4B	28
7.3B	19	3.4C	62
7.4A	40	3.4D	45
7.4B	22	2.1A	83
3.1A	39	2.1B	74
3.1B	7	2.1C	25
3.2A	29	2.2	87

Rank II Sites

The first three Rank II sites to be discussed consist of parts of Kelley Point Park (2.1A, 2.1B, & 2.2). Kelley Point Park itself is composed of four parts - the shoreline along the Willamette and Columbia rivers (2.1A), the shoreline along the Columbia Slough (2.2), the forested uplands (2.1B), and a meadow near the entrance to the park (2.1C).

The shoreline along the Willamette and Columbia rivers consists of a wide sandy beach, receiving heavy summer usage. The upland is



Zones 2, 3 and 7

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typical riparian forest, with an overstory of black cottonwood, with some willow and Oregon white ash in the zone between the forest and shoreline. The open meadow consists primarily of various grasses and weedy species. The shoreline along the Columbia Slough is excellent riparian habitat, with a natural bank sloping gradually at the mouth and more steeply as one proceeds up the slough. Black cottonwood, Oregon white ash, and willow are found along the bank. The shoreline receives little human disturbance.

With the exception of the meadow, the park receives high values for rarity of habitat, scenic quality, and educational potential. The slough receives high values for low physical and human disturbance, with the rest of the park receiving fairly high values.

The next Rank II site (3.4A) consists of the shoreline immediately upstream from the Columbia Slough, to the Oregon Steel property. The shoreline consists of a long narrow sandy beach, with only two docks along the entire stretch. There is a steep dirt bank, perhaps ten feet in height, undercut in many places, with exposed roots and old den holes of beavers and muskrats. There were a fair number of fallen trees on the beach, the end result of previous undercutting. The beach itself was covered with numerous tracks of beaver and shorebirds, indicating heavy wildlife use. One Belted Kingfisher nest was observed.

The top of the bank is heavily vegetated, with Oregon white ash, black cottonwood, willow, Himalayan blackberry, thistle, St. John's wort, "Tanacetafolium", snowberry, creek dogwood, with some patches of reed canarygrass. Band-tailed Pigeon, Downy Woodpecker, and Song Sparrow were observed.

The next Rank II site (7.1C) is the slope above the UDAG site in the upstream corner. The slope is steep and heavily vegetated, with black cottonwood, Oregon white oak, and a fairly diverse understory. Disturbed portions of the slope are covered with Himalayan blackberry.

The final Rank II site is the shoreline of the southern half of the UDAG site (7.1A), located immediately downstream from the Burlington Northern Railway bridge. The shoreline is primarily a natural mudflat and sandy beach, with numerous pilings and foundations from old buildings. There are two barges sunk in the bay, near the shoreline.

Vegetation along the shoreline is primarily black cottonwood, with an understory of Himalayan blackberry, with some weedy species around the building foundations. Heron tracks were observed all along the beach.

Rank III Sites

The first Rank III site consists of the upland of the southern half of the UDAG site (7.2B), located immediately downstream from the Burlington Northern Railway bridge. The upland was formerly covered with buildings, which have been completely demolished. There are still expanses of cement foundation, surrounded with weedy species. There is a fair amount of black cottonwood and Himalayan blackberry, with some Lombardy poplar. The upland also contains several dirt trails and a set of railway tracks.

The second Rank III site (3.4C) is a part of the Terminal 5 upland. It consists of a dense black cottonwood forest on the southern edge of the Terminal. There are several swales in this area, with small wetlands of reed canarygrass, willow, and black cottonwood.

The third Rank III site (3.4D) is also a part of the Terminal 5 upland, and consists of a wetland immediately north of the forest. The wetland consists of cattails, willows, "Artemisia", and rushes. It seems to have developed due to uneven filling of this area in the past.

The fourth Rank III site (7.2A, 7.3A) is the shoreline along the northern half of the UDAG site. The shoreline consists of a gently-sloping rocky beach, widening along the northern portion to include a small strip of sandy beach. Large pieces of concrete are piled periodically along the beach, interspersed with logs and driftwood. There are numerous pilings and dolphins along the waters edge; remnants of previous sawmills, dry docks, and other industrial uses.

The bank is steep and natural, undercut in many places and overgrown with weedy species, grasses, thistles, willow, and black cottonwood. The northern half of the site has denser cover than the southern half, offering more cover and food for wildlife. Much of the immediate upland on the southern half is open field, with pavement, gravel, or dirt.

The final Rank III site is the shoreline at Cathedral Park (7.4A). The shoreline consists primarily of a gently-sloping beach, with some remnant pilings exposed. Three docks for temporary tie-ups are located along here, as well as a public boat ramp. The shoreline is used for swimming. The immediate upland consists of maintained lawn, with a few scattered trees.

The final portion of the shoreline is more steeply-sloping, and is riprapped, with a Himalayan blackberry covering to the riprap.

Rank IV and V Sites

The remainder of this segment is primarily dominated by heavy marine industrial uses. Terminals 4 & 5 are located along here, as are Oregon Steel, Schnitzer, a boat repair shop, and several tank farms. Most of the shoreline is riprapped, with much of it covered with docks and wharves. There is very little landscaping, with only the occasional clump of trees, and a few vacant parcels with grasses and weedy species.

Figure 2 lists all of the habitat sites, according to value and Ranking categories.

FIGURE 2: WILDLIFE HABITAT SITES IN THE WILLAMETTE GREENWAY

Site No.	Score	Site Description
RANK I SITES		
21.1 B	114	Oaks Bottom (Upland portion)
21.1 A	101	Oaks Bottom (Shoreline)
21.1 C	98	East Island
15.3 D *	97	Doane Lake - railroad triangle
22 A	95	Ross Island, Toe Island, part of Hardtack Is.
4.2 A	95	Harborton (PGE and Gay Marina forested upland)
4.2 D	91	Harborton (Shoreline along Willamette Slough
RANK II SITES		
6 A	88	Linnton (shoreline beside townsite)
2.2	87	Columbian Slough entrance (shoreline)
23.4 A	87	Shoreline upstream from Willamette Park
2.1 A	83	Kelley Point Park (shoreline except Slough)
24.2 A	83	Sellwood Riverfront Park (shoreline)
24.3 A	83	PGE property downstream from S.R.Park (shore)
24.5 A	83	Oaks Amusement Park (shoreline)
24.3 B	82	PGE property downstream from S.R.Park (upland)
23.5 A	82	City property beside Staff Jennings (shore)
9.2	81	University of Portland bluff
3.4 A	80	Terminal 5 (shoreline)
15.3 A	80	Shoreline upstream from BNR bridge
11.4	75	Swan Island lagoon (east shoreline)
2.1 B	74	Kelley Point Park (forested upland)
11.7	72	Mock's Crest (sloped upland of Mocks Bottom)
23.2 A	72	Wetland downstream from Tequilla Willie's
15.5 A	72	Wetland upstream from Penwalt Chemicals
7.1 A	72	UDAG site (shoreline - upstream half)
24.6 A	71	Oregon Yachting Club (shoreline, houseboats)
4.2 E	70	Harborton (Willamette River shoreline -wapato)
7.1 C	70	UDAG site (sloped upland)
RANK III SITES		
15.2 C *	68	Wacker Siltronics property (far upland)
23.7	67	Powers Marine Park
22 C	65	Hardtack Island (portion also in 22A)
5.1 C	64	Shoreline adjacent to Kingsley Park

8.2 A	64	McCormick & Baxter property (shoreline)
3.4 C	62	Terminal 5 / Oregon Steel (upland forest)
15.2 B	62	Wacker Siltronics (near upland)
9.1	62	University of Portland (shoreline)
4/5 A	60	Transmission Tower Right-of-way (shoreline)
4.1 D **	58	Gay Marina property (shoreline)
15.10 C	57	Wetland in front of Westside Fireboat Station
7.2 A	57	UDAG site (shoreline -upstream half)
12.2 A	55	Swan Island Alaska Module site (shoreline)
4.2 B	53	Harborton (PGE, open undeveloped upland)
15.1 B	52	NNG property upland wetland
7.1 B	49	UDAG site (upland - upstream half)
10.2	47	tip of Swan Island (shoreline)
5.1 D	46	Upland adjacent to Kingsley Park
4/5 B	45	Transmission Tower Right-of-way (upland)
3.4 D	45	Terminal 5 (upland wetland)
14.4 C	45	Southern Pacific Railyard (sloped upland)
12.1 A	44	McCarthy Park - Swan Island (esplanade only)
7.3 A	44	UDAG site (shoreline - downstream half)
15.3 E	44	Property upstream from BNR bridge (upland)
8.1 C	42	Western Terminals property (sloped upland)
5.4 C	41	Knappton property (shoreline)
24.4	41	Sellwood Park
4.1 B **	40	Wetland on Gay Marina property
7.4 A	40	Cathedral Park (shoreline)

RANK IV SITES

3.1 A	39	Shoreline downstream from Cathedral Park
18.2 A	38	Downtown Steamplant (shoreline)
21.2 A	38	Ross Island S & G office property (shoreline)
15.1 A	37	NNG property (shoreline)
17.1 A	37	Shoreline between Marquam & Hawthorne br's
14.2 A	37	Thunderbird Inn (shoreline)
7.2 B	37	UDAG site (upland - upstream half)
11.2 A	36	Swan Island - dredge fill area (shoreline)
5.3 A	35	Shoreline adjacent to Linnton school
23.6 A	35	Staff Jennings Marina (shoreline)
13.1 A	35	Property upstream from Port-of-Call(shoreline)
5.1 A	34	Linnton sawmill (shoreline)
16.2 A	32	McCormick Pier Condominiums (shoreline)
6 B	31	Linnton townsite (upland)
23.5 B	31	Willamette Moorage (upland)
20.2 A	30	Pacific Metal property (shoreline)
19.2 A	30	PGE Station "L" property (shoreline)
3.3 C	30	Wetland in Transmission Right-of-way

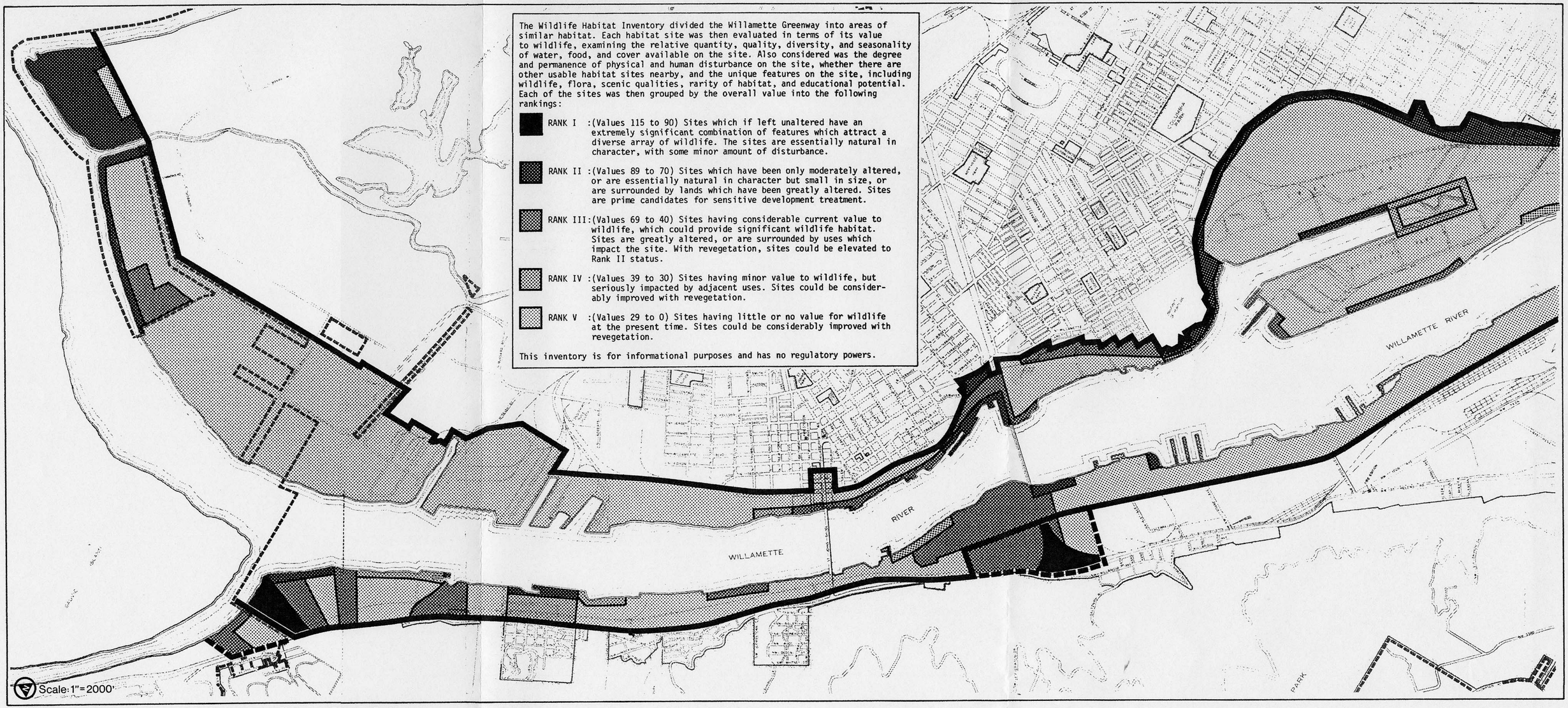
RANK V SITES

13.2 B	29	Port-of-Call (upland)
3.2 A	29	Terminal 4 (shoreline)
5.2 A	28	Property upstream from sawmill (shoreline)
11.1	28	Swan Island lagoon (west shoreline)
3.4 B	28	Terminal 5 (coal facility upland)
15.7 A	27	McCall Oil property (shoreline)
15.4 A	27	Penwalt Chemicals property (shoreline)
15.9 A	27	Gunderson property (shoreline)
15.6 A	26	Shell, Chevron, Union 76 dock (shoreline)
24.1 A	26	Portland Rowing Club (shoreline)
17.2 A	26	Eastside Esplanade
11.6	25	Mocks Bottom (level upland)
24.6 B	25	Oaks Amusement Park (upland)
2.1 C	25	Kelley Point Park (cleared upland)
19.1 B	24	Ross Island S & G processing area (upland)
12.3 A	24	Swan Island - Berth 314 (shoreline)
15.8 A	23	Acme Trading property (shoreline)
8.2 C	23	McCormick & Baxter Creosote (sloped upland)
23.3 C	23	Willamette Park (upland)
14.4 A	23	Southern Pacific Railyard (shoreline)
23.1 A	23	Spagetti Fac/Tequilla Willies (shoreline)
15.2 A	22	Wacker Siltronic property (shoreline)
18.2 B	22	Downtown Steam Plant (upland)
7.4 B	22	Cathedral Park (upland)
17.3 C	22	I84 terminus (sloped upland)
11.5	22	Coast Guard et.al. (shoreline)
23.3 A	22	Johns Landing condo's/Willamette Park (shore)
11.2 B	21	Swan Island dredge fill area (mudflat)
17.2 B	21	Freeway landscaping behind Eastside Esplanade
17.3 A	21	I84 terminus (shoreline)
4.1 A **	20	Gay Marina (upland)
4.1 C **	20	Gay Marina (upland between RR & highway)
14.3 A	20	Lower Albina area (shoreline)
20.1 A	20	Zidell property (shoreline)
20.3 A	20	Reidel/Cascade Construction (shoreline)
7.3 B	19	UDAG site (upland - downstream half)
3.3 A	19	Rivergate - excluding Terminals (shoreline)
16.1 A	19	Shoreline from Fremont to Broadway Br's.
18.1 A	19	Tom McCall Waterfront Park (shoreline)
13.2 A	19	Port-of-Call (shoreline)
24.1 B	17	Portland Rowing Club (upland)
12.1 B	17	Swan Island (upland)
15.10 A	17	Western Transportation property (shoreline)
5.4 A	16	Mobil property (shoreline)

5.4 D	16	Property downstream from St.John's br (shore)
5.5 A	16	Corp.of Engineers property (shoreline)
10.1	16	Swan Island drydocks (shoreline)
10.3 A	16	Swan Island lagoon (NW shoreline)
15.11 A	16	Terminals 2 and 1 (shoreline)
8.1 A	16	Western Terminals property (shoreline)
21.2 B	16	Ross Island S & G offices (upland)
19.1 A	16	Ross Island S & G processing area (shore)
14.1 A	16	Flour mill (shoreline)
15.3 C *	15	Property upstream from BNR bridge (upland)
24.2 B	15	Sellwood Riverfront Park (upland)
3.3 B	15	Rivergate - except Terminals (upland)
23.4 B	13	Miles Place residential area (upland)
14.2 B	11	Thunderbird Inn (upland)
15.3 B	10	Portion of Penwalt Chemical (upland)
23.6 B	10	Staff Jennings Marina (upland)
17.3 B	10	I84 terminus (level upland)
5.5 B	9	Corp. of Engineer property (upland)
5.1 B	8	Linnton sawmill (upland)
20.2 B	8	Pacific Metal property (upland)
23.1 B	8	Spagetti Fac./Tequilla Willies (upland)
23.2 B	8	Johns Landing Condominium property (upland)
5.4 B	7	Mobil/Knappton properties (upland)
3.1 B	7	Upland downstream from Cathedral Park
5.3 B	6	Property adjacent to Linnton School (upland)
14.3 B	6	Lower Albina area (upland)
13.1 B	6	Property upstream from Port-of-Call (upland)
18.1 B	5	RiverPlace Condominiums (upland)
15.7 B	4	McCall Oil property (upland)
15.9 B	4	Gunderson property (upland)
4.2 C	3	Harborton (developed upland)
23.3 B	3	Johns Landing condo's/Willamette Park (upland)
5.2 B	0	Property upstream from sawmill (upland)
15.5 B	0	Shell, Mobil, Union 76 terminals (upland)
15.4 B	0	Penwalt Chemicals property (upland)
11.3	0	Swan Island (uplands off peninsula)
11.2 C	0	Property leased to Cummins
10.3 B	0	Swan Island drydocks (upland)
15.6 B	0	McCall Oil et al. (upland)
15.8 B	0	Acme Trading property (upland)
15.10 B	0	Western Transportation property (upland)
15.11 B	0	Terminals 1 and 2 (upland)
16.2 B	0	McCormick Pier condominiums (upland)
16.1 B	0	Upland between Fremont and Broadway br's
8.1 B	0	Western Terminals property (upland)
8.2 B	0	McCormick & Baxter Creosote (upland)

20.1	B	0	Zidell property (upland)
20.3	B	0	Riedel/Cascade Construction (upland)
3.2	B	0	Terminal 4 (upland)
15.1	C	0	NNG property (upland)
19.2	B	0	PGE Station "L" property (upland)
17.1	B	0	Upland between Marquam and Hawthorne br's
14.4	B	0	Southern Pacific Railyard (level upland)
12.2	B	0	Swan Island (upland)
12.3	B	0	Swan Island (upland)

* - Site is outside the Greenway Boundary.
** - Site is outside City, and Greenway Boundary.



The Wildlife Habitat Inventory divided the Willamette Greenway into areas of similar habitat. Each habitat site was then evaluated in terms of its value to wildlife, examining the relative quantity, quality, diversity, and seasonality of water, food, and cover available on the site. Also considered was the degree and permanence of physical and human disturbance on the site, whether there are other usable habitat sites nearby, and the unique features on the site, including wildlife, flora, scenic qualities, rarity of habitat, and educational potential. Each of the sites was then grouped by the overall value into the following rankings:

- RANK I :(Values 115 to 90) Sites which if left unaltered have an extremely significant combination of features which attract a diverse array of wildlife. The sites are essentially natural in character, with some minor amount of disturbance.
- RANK II :(Values 89 to 70) Sites which have been only moderately altered, or are essentially natural in character but small in size, or are surrounded by lands which have been greatly altered. Sites are prime candidates for sensitive development treatment.
- RANK III:(Values 69 to 40) Sites having considerable current value to wildlife, which could provide significant wildlife habitat. Sites are greatly altered, or are surrounded by uses which impact the site. With revegetation, sites could be elevated to Rank II status.
- RANK IV :(Values 39 to 30) Sites having minor value to wildlife, but seriously impacted by adjacent uses. Sites could be considerably improved with revegetation.
- RANK V :(Values 29 to 0) Sites having little or no value for wildlife at the present time. Sites could be considerably improved with revegetation.

This inventory is for informational purposes and has no regulatory powers.

10 Wildlife Habitat Site Rankings
NORTH
Lower Willamette River Wildlife Habitat Inventory

Willamette Greenway boundary
Inventoried areas outside Greenway boundary

March, 1986
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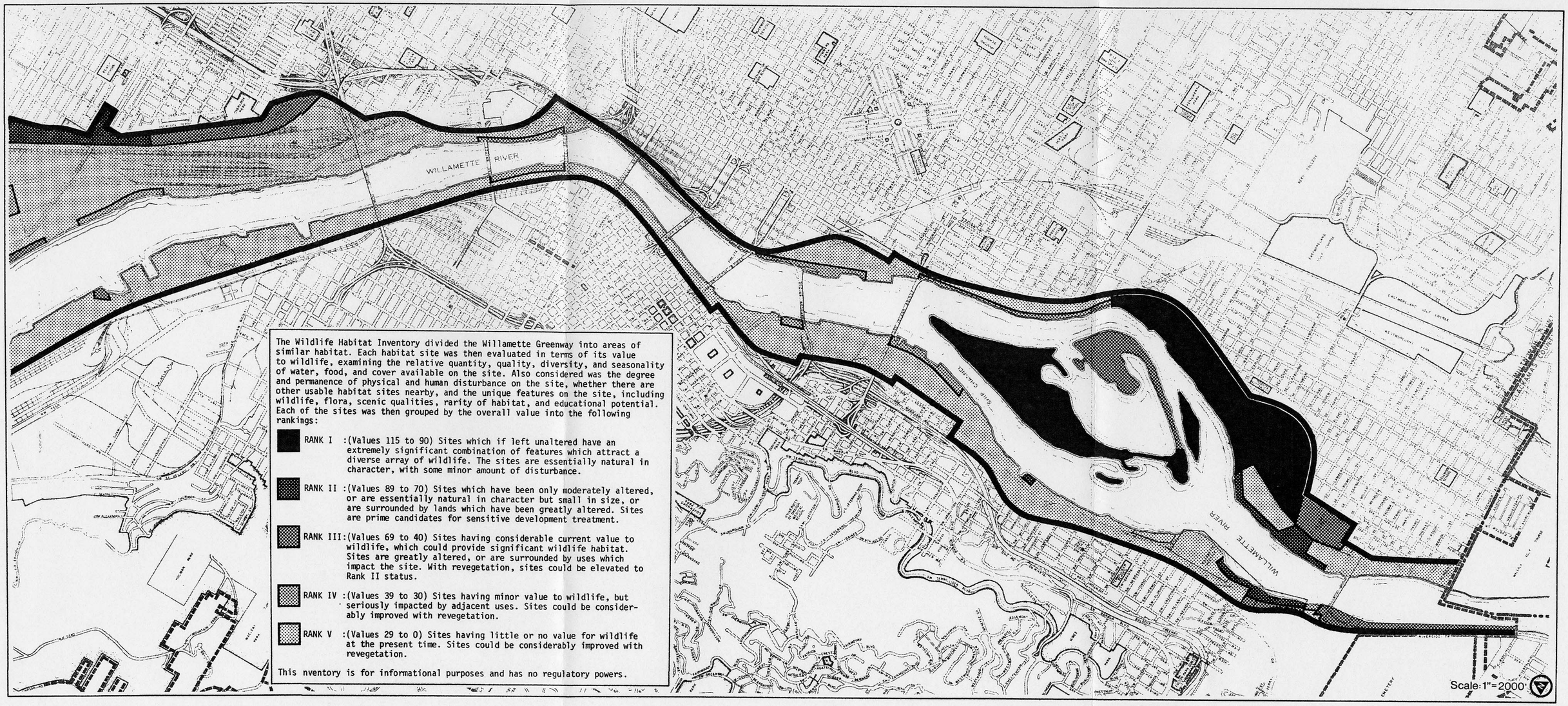
Portland, Oregon



The Wildlife Habitat Inventory divided the Willamette Greenway into areas of similar habitat. Each habitat site was then evaluated in terms of its value to wildlife, examining the relative quantity, quality, diversity, and seasonality of water, food, and cover available on the site. Also considered was the degree and permanence of physical and human disturbance on the site, whether there are other usable habitat sites nearby, and the unique features on the site, including wildlife, flora, scenic qualities, rarity of habitat, and educational potential. Each of the sites was then grouped by the overall value into the following rankings:

- RANK I :(Values 115 to 90) Sites which if left unaltered have an extremely significant combination of features which attract a diverse array of wildlife. The sites are essentially natural in character, with some minor amount of disturbance.
- RANK II :(Values 89 to 70) Sites which have been only moderately altered, or are essentially natural in character but small in size, or are surrounded by lands which have been greatly altered. Sites are prime candidates for sensitive development treatment.
- RANK III:(Values 69 to 40) Sites having considerable current value to wildlife, which could provide significant wildlife habitat. Sites are greatly altered, or are surrounded by uses which impact the site. With revegetation, sites could be elevated to Rank II status.
- RANK IV :(Values 39 to 30) Sites having minor value to wildlife, but seriously impacted by adjacent uses. Sites could be considerably improved with revegetation.
- RANK V :(Values 29 to 0) Sites having little or no value for wildlife at the present time. Sites could be considerably improved with revegetation.

This nventory is for informational purposes and has no regulatory powers.

Scale: 1"=2000'

Willamette Greenway boundary
Inventoried areas outside Greenway boundary

Wildlife Habitat Site Rankings
SOUTH
Lower Willamette River Wildlife Habitat Inventory

10

March, 1986
Bureau of Planning
Portland, Oregon

III. POTENTIAL

This section of the report addresses wildlife potential - the ability to render a particular site more attractive to wildlife. This can be accomplished through diversification of the plant community, screening the site from adjacent disruptive land uses, the provision of higher water quality and quantity, and similar techniques. The discussion is intended to give some general guidance to land use planners, developers, and consultants concerning how wildlife habitat can be enhanced.

The relative low score that more that 100 sites received was attributable to the three factors that appear on the inventory rating sheet: Food, Water, and Cover. As was stated in the methodology section, these three factors are held by wildlife managers to be essential in attracting and maintaining wildlife species. The manner in which one mixes these factors will attract or, when appropriate, discourage specific species or groups of organisms (plants or animals).

Some of the sites received an overall value of zero. Of course, no site has zero value to wildlife, but on a relative scale these sites have negligible wildlife habitat value and host primarily non-native species, such as Rock Dove (pigeon), European Starling, and House Sparrow, all of which were introduced to the United States from Europe. These species are all tied to man-made structures and are commonly seen in industrial areas, on bridges, and downtown. For planning purposes, the sites can be assumed to have negligible wildlife values, although with appropriate vegetative plantings to provide nesting cover, food, and protection from weather extremes, these areas could be rehabilitated to provide significant wildlife habitat value.

A. Water

All of the sites inventoried on the riverfront have water as a significant component. In many instances the site was almost devoid of wildlife habitat except for the presence of the river. Whenever possible, it is desirable from a wildlife perspective to diversify the water regime on sites by providing for, or retaining and improving, emergent (marshy) or shrubby (willow and other woody-dominated) wetlands adjacent to the river. This could be accomplished where it is feasible and desirable by grading the upland portion of a site to provide water to the site, and by planting with

appropriate native wetland plant species (a list is included in the Appendix). The interface of river with wetland would provide an important habitat that has all but disappeared along the Willamette River within the city limits. Oaks Bottom is perhaps the best example of a riverine/wetland system, although the connection is now via a culvert rather than the more natural floodplain that existed prior to the construction of the railroad dike.

Water quality is also of concern and should be considered whenever development is planned near a stream or wetland. Wetlands have come to be recognized as important natural filters for a variety of pollutants and effluent.

There are several sites where wetland creation on the uplands away from the river would be feasible. Whenever that action would be compatible with proposed land uses on that site, the creation of an amenity as well as wildlife habitat could be realized. This could be accomplished by regrading the site and planting the resulting wetland area with native species to form a combination of open water and marsh, which would attract waterfowl, especially during the winter months. The edges of such an area, planted with cattail, wapato, rushes, and similar species, would attract numerous nongame birds, amphibians, and reptiles, which have been displaced through wetland degradation over the years.

Any discussion regarding the creation or retention of water features in an urban setting must be accompanied by vector control plans. The public perception of wetland areas is generally that they are "swamps" which breed rats, mosquitoes, and other "vermin".

A natural habitat does not harbor undesirable rodents, such as rats. It is man-made structures, abandoned automobiles, and other similar sites which are responsible for these organisms' success in the urban setting. There are many species of small mammals which do inhabit natural wetlands, but these are not nuisance species.

Mosquitoes breed in aquatic environments, but the nature of the water will determine which species of mosquito are found there. If the water regime is maintained properly, a large amount of the "mosquito problem" can be alleviated. There is a project underway at Oaks Bottom Wildlife Park which includes the digging of deeper ponds, and providing year-round water which discourages specific types of mosquitoes. There is also an ongoing Integrated Pest Management Program which utilizes numerous methods to control mosquitoes and other pest species in Multnomah County. Multnomah County's Vector Control directs the program and are available to offer assistance to the City, developers, and others regarding pest management which de-emphasizes toxic controls.

B. Food and Cover

Food and cover can be provided by the appropriate planting of shrub, tree, and herbaceous species. Whenever consistent with site design, the use of native species which provide both food and cover is desirable. A list of native species is included in the Appendix.

The overall objective should be to increase species and structural diversity. Along the river and within adjacent wetlands, typical tree species include willow ("Salix spp."), black cottonwood ("Populus trichocarpa"),and Oregon white ash ("Fraxinus latifolia"). Although it does not grow in any of the existing habitats along the Willamette River, western red cedar ("Thuja plicata"), a coniferous evergreen, could provide additional winter cover.

Shrubby species that naturally occur in Portland include: creek or red osier dogwood ("Cornus stolonifera"), red and blue elderberry ("Sambucus racemosa" and "S. cerulea"), red flowering currant ("Ribes sanguineum"), common snowberry ("Symphoricarpos albus"), Oregon grape ("Berberis spp."), the non-native butterfly bush ("Buddleja davidii"), hardtack or spirea ("Spirea douglasii"), roses ("Rosa spp."), Pacific ninebark ("Physocarpus capitatus").

Herbaceous species include: Beggars-tick ("Bidens cernua"), spike rush ("Eleocharis spp."), fireweeds ("Epilobium spp."), touch-me-not ("Impatiens noli-tangere"), yellow iris ("Iris pseudacorus"), smartweed or knotweed ("Polygonum spp."), Wapato ("Sagittaria spp."), bulrush ("Scirpus spp."), Cat-tail ("Typha latifolia" and "T. angustifolia"), rushes ("Juncus spp."), buttercups ("Ranunculus spp."), and dock ("Rumex spp.").

Which species are used will be determined by the depth, duration, and quality of water available. There are guides available that recommend specific species, and resource agencies will also provide this information. Several resource agencies are listed below.

Environmental Protection Agency
1200 SW 6th Avenue, Mail Stop 423,
Seattle, Washington. 98101
(206) 442-8511.

Oregon Department of Fish and Wildlife
17330 Evelyn St.
Clackamas, Oregon. 97015.
657-2058 ; or

801 Gales Creek Rd
Forest Grove, Oregon. 97117
229-5104

U.S. Army Corps. of Engineers
Permits Section
319 SW Pine
Portland, Oregon. 97204
221-6995

C. Human Disturbance

One of the greatest impacts on plants and animals is the presence of humans and their pets. This is inevitable in an urban setting, and whether humans are encouraged to use a particular site is a decision that involves tradeoffs. The overall objective of wildlife habitat protection, enhancement, and recreation on the Willamette River within Portland city limits should focus on providing interaction between people, plants, and animals.

There will be some instances where it is not desirable to encourage public access; the Great Blue Heron rookery on Ross Island, and small fragile wetlands with special features or vegetation such as the Swan Island Wapato site are examples. Interest has been expressed by the Oregon Department of Fish and Wildlife for the retention and creation of small wildlife "islands" along the length of the Willamette Greenway. This would allow those species that utilize the Willamette River as a travel corridor to move from "island" to "island".

Several species of wildlife can co-exist in close proximity to humans. If the objective of habitat enhancement is to provide for wildlife viewing areas, a series of viewing areas need to be developed along the Willamette Greenway. It should be remembered that species which are more shy will be precluded from using these areas. Wildlife enhancement includes providing for areas where human contact is minimized (ie. protected areas), areas where limited contact is encouraged (wildlife viewing areas), and the development of wildlife-attracting landscape treatments in areas with high human usage.

APPENDIX

Native Plants and their Importance to Wildlife

This appendix presents the more common native plant species found along the lower Willamette River, and notes the number of species of various groups of wildlife which utilize each plant species. Table A-1 lists this information. The number of wildlife species utilizing each plant is not meant to be exhaustive; it is included to give a general indication of the relative value of the plant to wildlife. The number of wildlife species indicated probably understates the actual number of wildlife species utilizing the plants.

The wildlife species in Table A-1 are broken down into seven groups:

Shorebirds	(SB)
Waterfowl	(W)
Upland Game Birds	(UG)
Songbirds	(S)
Fur and Game Mammals	(FGM)
Small Mammals	(SM)
Hoofed Browsers	(HB)

Missing from Table A-1 are Amphibians, Reptiles, and Raptors, which were not listed in the sources used.

The commonly found wildlife species in each of the seven groups are listed in Table A-2.

TABLE A-1: UTILIZATION OF COMMON PLANT SPECIES BY WILDLIFE GROUP

Plant Species	Latin name	SB	W	UG	S	FGM	Sm	HB
Upland								
chokecherry	Prunus virginiana			3	21	11	2	
bittercherry	Prunus emarginata			3	21	11	2	
Indian plum	Oemleria cerasiformis	+	+	+	+	+	+	+
lodgepole pine	Pinus contorta			4	18	4	3	2
western hemlock	Tsuga heterophylla			1	3	3	1	
Sitka spruce	Picea sitchensis				4	1		1
grand fir	Abies grandis			1	1	3	2	1
western red cedar	Thuja plicata			1	6	5	3	1
quaking aspen	Populus tremuloides			1	1	5		1
black cottonwood	Populus trichocarpa			1	1	5		1
hazelnut	Corylus cornuta			1	2	4	2	1
Oregon white oak	Quercus garryana		1	5	18	6	2	2
low Oregongrape	Berberis nervosa			1	4	1	1	1
gooseberry	Ribes sp.		1		4	5	4	1
currant	Ribes sp.		1		4	5	4	1
black hawthorn	Crataegus douglasii		1	3	5	7	1	
Sitka mountain-ash	Sorbus sitchensis			1	6		1	
western mountain-ash	Sorbus scopulina			1	6		1	
serviceberry	Amelanchier sp.			2	15	4	3	2
trailing blackberry	Rubus vitifolius			4	22	7	1	2
smooth sumac	Rhus glabra			4	16	1	1	1
poison oak	Rhus diversiloba			3	21	2		
bigleaf maple	Acer macrophyllum			2	9	6	1	1
vine maple	Acer circinatum			2	9	6	1	1
ceanothus	Ceanothus sp.					3	2	2
red-osier dogwood	Cornus stolonifera		1	4	15	6	2	2
Pacific dogwood	Cornus nutallii		1	4	15	6	2	2
Pacific madrone	Arbutus menziesii			1	1			1
bearberry	Arctostaphylos uva-ursi			1				
kinnikinnik	Arctostaphylos nervadensis			1				
manzanita	Arctostaphylos sp.				2	1	2	1
creeping snowberry	Symphoricarpos mollis			3	9	3	2	2
salal	Gaultheria shallon			2	4			1
red blueberry	Vaccinium parvifolium			2	15	6	2	1
grouseberry	Vaccinium scoparium			2	15	6	2	1
dwarf bilberry	Vaccinium myrtillus			2	15	6	2	1
dwarf huckleberry	Vaccinium caespitosum			2	15	6	2	1
Cascade blueberry	Vaccinium deliciosum			2	15	6	2	1
globe huckleberry	Vaccinium globulare			2	15	6	2	1
thin-leaved blueberry	Vaccinium membranaceum			2	15	6	2	1
Alaska blueberry	Vaccinium alaskaense			2	15	6	2	1

TABLE A-1: UTILIZATION OF COMMON PLANT SPECIES BY WILDLIFE GROUP

Plant Species	Latin name	SB	W	UG	S	FGM	Sm	HB
early blueberry	Vaccinium ovalifolium			2	15	6	2	1
blue elderberry	Sambucus cerulea			3	24	2	2	2
red elderberry	Sambucus callicarpa			3	24	2	2	2
high bush cranberry	Viburnum opulus							
Parry's knotweed	Polygonum parryi		3	3	13	1	2	1
broadleaf knotweed	Polygonum minimum		3	3	13	1	2	1
bushy knotweed	Polygonum ramosissimum		3	3	13	1	2	1
erect knotweed	Polygonum erectum		3	3	13	1	2	1
American bistort	Polygonum bistortoides		3	3	13	1	2	1
wiry knotweed	Polygonum majus		3	3	13	1	2	1
Douglas' knotweed	Polygonum douglasii		3	3	13	1	2	1
willow weed	Polygonum lapathifolium		3	3	13	1	2	1
Nutalls' knotweed	Polygonum nutallii		3	3	13	1	2	1
white-margined knotweed	Polygonum polygaloides		3	3	13	1	2	1
water knotweed	Polygonum watsonii		3	3	13	1	2	1
closefld knotweed	Polygonum confertiflorum		3	3	13	1	2	1
Kellogg's knotweed	Polygonum Kelloggii		3	3	13	1	2	1
sawatch knotweed	Polygonum sawatchense		3	3	13	1	2	1
	Polygonum exsertum		3	3	13	1	2	1
Fowlers' knotweed	Polygonum fowleri		3	3	13	1	2	1
prostrate knotweed	Polygonum aviculare		3	3	13	1	2	1
	Polygonum achoreum		3	3	13	1	2	1
alpine knotweed	Polygonum phytolaccaefolium		3	3	13	1	2	1
Newberry's fleeceflower	Polygonum newberryi		3	3	13	1	2	1
Pacific brome-grass	Bromus pacificus		1	3	7		1	1
smooth brome-grass	Bromus inermis		1	3	7		1	1
pumpelly brome-grass	Bromus pumpellianus		1	3	7		1	1
California brome-grass	Bromus carinatus		1	3	7		1	1
Spanish-clover	Lotus purshiana			3				
seaside lotus	Lotus formosissimus			3				
miner's lettuce	Montia perfoliata			2	10			
slender fescue-grass	Festuca octoflora				4			1
Coast Range fescue-grass	Festuca subuliflora				4			1
bearded fescue-grass	Festuca subulata				4			1
western fescue-grass	Festuca occidentalis				4			1
sheep fescue-grass	Festuca ovina				4			1
green fescue-grass	Festuca viridula				4			1
red fescue-grass	Festuca rubra				4			1
Douglas' buckwheat	Eriogonum douglasii		2	3	9		1	
sulfur buckwheat	Eriogonum umbellatum		2	3	9		1	
barestem buckwheat	Eriogonum nudum		2	3	9		1	
tall buckwheat	Eriogonum elatum			3	9		1	
Howell's bluegrass	Poa howellii		1	3	7	1		
mutton-grass	Poa fendleriana		1	3	7	1		

TABLE A-1: UTILIZATION OF COMMON PLANT SPECIES BY WILDLIFE GROUP

Plant Species	Latin name	SB	W	UG	S	FGM	Sm	HB
Wheeler's bluegrass	Poa nervosa		1	3	7	1		
seashore bluegrass	Poa macrantha		1	3	7	1		
Canada bluegrass	Poa compressa		1	3	7	1		
Gray's bluegrass	Poa grayana		1	3	7	1		
pink buttercup	Ranunculus andersonii	1	1	3	1	3		1
water-plantain buttercup	Ranunculus hartwegii	1	1	3	1	3		1
chick lupine	Lupinus microcarpus			1	1	1	1	1
rusty lupine	Lupinus pusillus			1	1	1	1	1
field lupine	Lupinus micranthus			1	1	1	1	1
two-color lupine	Lupinus bicolor			1	1	1	1	1
sulfur lupine	Lupinus sulphureus			1	1	1	1	1
stream lupine	Lupinus rivularis			1	1	1	1	1
prairie lupine	Lupinus lepidus			1	1	1	1	1
Touch-me-not	Impatiens noli-tangere			3			1	
Fireweed	Epilobium spp.						1	1
Nodding Beggars-tick	Bidens cernua		1	2	1			
<u>Streambanks</u>								
willow	Salix sp.			1	1	3	1	1
common snowberry	Symphoricarpos albus			3	9	3	2	2
vine maple	Acer circinatum			2	9	6	1	1
red-osier dogwood	Cornus stolonifera		1	4	15	6	2	2
wild rose	Rosa nutkana			3	6	5	1	2
creambush ocean spray	Holodiscus discolor	+	+	+	+	+	+	+
Douglas's spirea	Spirea douglasii	+	+	+	+	+	+	+
evergreen blackberry	Rubus laciniatus			4	22	7	1	2
hazelnut	Corylus cornuta			1	2	4	2	1
tall Oregongrape	Berberis aquifolium			1	4	1	1	1
red elderberry	Sambucus callicarpa			3	24	2	2	2
blue elderberry	Sambucus caerulea			3	24	2	2	2
Pacific ninebark	Physocarpus capitatus	+	+	+	+	+	+	+
western serviceberry	Amelanchier alnifolia			2	15	4	3	2
black hawthorn	Crataegus douglasii		1	3	5	7	1	
western crabapple	Pyrus fusca			3	17	9	3	1
red alder	Alnus rubra			2	6	1		2
<u>Wetland</u>								
cascara	Rhamnus purshiana			1	6	2	2	1
red alder	Alnus rubra			2	6	1		2
black cottonwood	Populus trichocarpa			1	1	5		1

TABLE A-1: UTILIZATION OF COMMON PLANT SPECIES BY WILDLIFE GROUP

Plant Species	Latin name	SB	W	UG	S	FGM	Sm	HB
Oregon ash	Fraxinus latifolia			1	6		1	
quaking aspen	Populus tremuloides			1	1	5		1
paper birch	Betula papyrifera			1	6	4	1	2
Indian plum	Oemleria cerasiformis	+	+	+	+	+	+	+
western hemlock	Tsuga heterophylla			1	4	3	1	1
western red cedar	Thuja plicata			1	6	5	3	1
lodgepole pine	Pinus contorta			4	18	4	3	3
Sitka spruce	Picea sitchensis				4	1		1
willow	Salix sp.			1	1	3	1	1
Douglas's spirea	Spirea douglasii	+	+	+	+	+	+	+
red-osier dogwood	Cornus stolonifera		1	4	15	6	2	2
red elderberry	Sambucus callicarpa			3	24	2	2	2
salmonberry	Rubus spectabilis			4	22	7	1	2
black twinberry	Lonicera involucrata	+	+	+	+	+	+	+
water smartweed	Polygonum amphibium	4	19	1	12	2	1	
water smartweed	Polygonum punctatum		19	1	12	2	1	
water smartweed	Polygonum coccineum	4	19	1	12	2	1	
fall knotweed	Polygonum spergulariaeforme	4	19	1	12	2	1	
slender sedge	Carex lasiocarpa	4	14	2	5	3	1	1
water sedge	Carex aquatilis	4	14	2	5	3	1	1
gray sedge	Carex canescens	4	14	2	5	3	1	1
Cusick's sedge	Carex cusickii	4	14	2	5	3	1	1
inland sedge	Carex interior	4	14	2	5	3	1	1
slough sedge	Carex obnupta	4	14	2	5	3	1	1
beaked sedge	Carex rostrata	4	1	2	5	3	1	1
Sitka sedge	Carex sitchensis	4	1	2	5	3	1	1
Olney's bulrush	Scirpus olneyi	5	20	1	3			
pale great bulrush	Scirpus heterochaetus	5	20	1	3	1		
hardstem bulrush	Scirpus acutus	5	20	1	3			
softstem bulrush	Scirpus validus	5	20	1	3			
small-fruit bulrush	Scirpus microcarpus	5	20	1	3	1		
dagger-leaf rush	Juncus ensifolius	+	+	+	+	+	+	+
Baltic rush	Juncus balticus	+	+	+	+	+	+	+
common spike-rush	Eleocharis palustris	4	14			1		
simplestem bur-reed	Sparganium emersum	3	11			1		
Alaska bentgrass	Agrostis aequivalvis	+	+	+	+	+	+	+
common cat-tail	Typha latifolia		3			1		
lesser cat-tail	Typha angustifolia		3			1		
shore buttercup	Ranunculus cymbalaria	1	1	3	1	3		1
mountain buttercup	Tanunculus populago	1	1	3	1	3		1
creeping buttercup	Ranunculus flammula	1	1	3	1	3		1
water-plantain buttercup	Ranunculus alismaefolius	1	1	3	1	3		1
longbeaked water-buttercup	Ranunculus longirostris	1	1	3	1	3		1
yellow water-buttercup	Ranunculus flabellaris	1	1	3	1	3		1

TABLE A-1: UTILIZATION OF COMMON PLANT SPECIES BY WILDLIFE GROUP

Plant Species	Latin name	SB	W	UG	S	FGM	Sm	HB
straightbeak buttercup	Ranunculus orthorhyncus	1	1	3	1	3		1
Pennsylvania buttercup	Ranunculus pensylvanicus	1	1	3	1	3		1
wapato	Sagittaria spp.		15					

TABLE A-2: WILDLIFE SPECIES ALONG THE LOWER WILLAMETTE RIVER

Shorebirds

Common	Less Common
American Dipper	Long-billed Curlew
Sandhill Crane	Marbled Godwit
Short-billed Dowitcher	Herring Gull
Long-billed Dowitcher	Glaucous Gull
Glaucous-winged Gull	Wilson's Phalarope
Western Gull	Lesser Golden Plover
Californian Gull	Semi-palmated Plover
Mew Gull	Snowy Plover
Bonapartes Gull	Virginia Rail
Ring-billed Gull	Spotted Sandpiper
Killdeer	Solitary Sandpiper
Western Sandpiper	Western Sandpiper
Common Snipe	Willet Sandpiper
Wimbrel	Sora Rail
	Black Tern
	Caspian Tern
	Fosters Tern
	Greater Yellowlegs
	Lesser Yellowlegs

Waterfowl

Common	Less Common
Bufflehead	American Bittern
Canvasback	Gadwall
American Coot	Barrow's Goldeneye
Double-crested Cormorant	Snow Goose
Common Goldeneye	White-footed Goose
Canada Goose	Eared Grebe
Horned Grebe	Red-necked Grebe
Pied-billed Grebe	Black-crowned Night Heron
Western Grebe	Green-backed Heron
Great Blue Heron	Redheaded Duck
Common Loon	Greater Scaup
Mallard	Northern Shoveler
Common Merganser	Mute Swan

Waterfowl (cont.)

Common	Less Common
Hooded Merganser	Blue-winged Teal
Red-breasted Merganser	Cinnamon Teal
Northern Pintail	Eurasian Wigeon
Ring-necked Duck	
Ruddy Duck	
Lesser Scaup	
Northern Shoveler	
Trumpeter Swan	
Whistling Swan	
Common Teal	
American Wigeon	
Wood Duck	

Upland Game Birds

Common	Less Common
Mourning Dove	Northern Bobwhite
Rock Dove	Ruffed Grouse
Ring-necked Pleasant	
Band-tailed Pigeon	
California Quail	

Songbirds

Common	Less Common
Brewer's Blackbird	Tricolored Blackbird
Red-winged Blackbird	Yellow-headed Blackbird
Bushtit	Western Bluebird
Black-capped Chickadee	Lazuli Bunting
Chestnut-backed Chickadee	Yellow-breasted Chat
Brown-headed Cowbird	Brown Creeper
Common Crow	Red Crossbill
House Finch	Yellow-billed Cuckoo
Northern Flicker	Purple Finch
American Goldfinch	Alder Flycatcher
Black-headed Grosbeak	Dusky Flycatcher
Rufous Hummingbird	Hammond's Flycatcher
Scrub Jay	Olive-sided Flycatcher
Steller's Jay	Western Flycatcher
Oregon Junco	Willow Flycatcher
Belted Kingfisher	Lesser Goldfinch

Songbirds (cont.)

Common	Less Common
Golden-crowned Kinglet	Allen's Hummingbird
Horned Lark	Anna's Hummingbird
Western Meadowlark	Ruby-crowned Kinglet
White-breasted Nuthatch	Black-billed Magpie
Red-breasted Nuthatch	Purple Martin
Western Wood Pewee	Northern Oriole
Water Pipit	Red-breasted Sapsucker
American Robin	Loggerhead Shrike
Pine Siskin	Northern Shrike
Fox Sparrow	Chipping Sparrow
Golden-crowned Sparrow	Vesper Sparrow
House Sparrow	White-throated Sparrow
Savanna Sparrow	Hermit Thrush
Song Sparrow	Veery
White-crowned Sparrow	Hutton's Vireo
European Starling	Red-eyed Vireo
Barn Swallow	Solitary Vireo
Cliff Swallow	Blackthroated Gray Warbler
Tree Swallow	Hermit Warbler
Violet-green Swallow	Nashville Warbler
Western Tanager	Townsend's Warbler
Swainson's Thrush	Acorn Woodpecker
Varied Thrush	Lewis' Woodpecker
Rufous-sided Towhee	Pileated Woodpecker
Warbling Vireo	House Wren
MacGillivray's Warbler	Marsh Wren
Orange-crowned Warbler	
Wilson's Warbler	
Yellow Warbler	
Yellow-rumped Warbler	
Cedar Waxwing	
Downy Woodpecker	
Hairy Woodpecker	
Bewick's Wren	
Winter Wren	
Common Yellowthroat	

Fur & Game Mammals

Common	Less Common
Beaver	Black Bear
Coyote	Bobcat
Opossum	Gray Fox
Brush Rabbit	Red Fox
Raccoon	Martin
Douglas Squirrel	Mink
Northern Flying Squirrel	Mountain Lion
Muskrat	Nutria
	River Otter
	Porcupine
	Snowshoe Rabbit
	Spotted Skunk
	Western Gray Squirrel

Small Mammals

Common	Less Common
Big Brown Bat	Fringed Bat
Little Brown Bat	Hoary Bat
Long-legged Bat	Long-eared Bat
Siver-haired Bat	Townsend's Big-eared Bat
Yuma Bat	Reddish Tree Mouse
Townsend Chipmunk	Black Rat
Camas Gopher	Long-tailed Vole
Mazama Gopher	White-footed Vole
Coast Mole	
Shrew Mole	
Townsend Mole	
Deer Mouse	
House Mouse	
Pacific Jumping Mice	
Norway Rat	
California Ground Squirrel	
Pacific Shrew	
Trowgridge's Shrew	
Vagrant Shrew	

Hoofed Browsers

Common	Less Common
	Blacktail Deer
	Elk

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