

Draft

**Revised Off-site  
Wetland Mitigation Plan**

**Seattle-Tacoma International Airport  
Master Plan Update Improvements**

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**Parametrix, Inc.  
August 18, 1998**

**AR 041715**

**REVISED  
OFF-SITE WETLAND MITIGATION PLAN**

**MASTER PLAN UPDATE DEVELOPMENT ACTIONS  
SEATTLE-TACOMA INTERNATIONAL AIRPORT**

Prepared for

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## 1. INTRODUCTION

In December 1996, the Port submitted an application to the Army Corps of Engineers for a permit to fill wetlands at Sea-Tac Airport associated with the Master Plan Update improvements in compliance with Section 404 of the Clean Water Act. The Section 404 permit application submitted to the Corps of Engineers includes a Joint Aquatic Resource Permits Application (JARPA). The JARPA includes reports on the delineation of wetlands at Seattle-Tacoma International Airport (STIA), a wetland mitigation plan, a mitigation plan describing the relocation of Miller Creek, and accompanying tables and drawings describing the proposed project.

### 1.1 RATIONALE FOR OFF-SITE HABITAT MITIGATION

Wildlife habitat mitigation at the STIA is not feasible because: (1) in the Record of Decision for the project, FAA concluded that "wildlife attractions" within 10,000 ft of an active runway is not allowable; and (2) wildlife control activities in wetlands near the airport would conflict with wetland habitat mitigation goals. Because of wildlife attraction issues, the Port cannot commit to maintaining, in perpetuity, sites on or near the Airport as wetland habitat mitigation. If mitigation site became a safety concern because of its attraction to wildlife, particularly birds, and jeopardize aircraft safety, the Port would be compelled to remove the hazard, including flora (i.e. Perch trees) and/or fauna.

There are compelling reasons in favor of off-airport mitigation of wildlife habitat mitigation. *Port of Seattle Position Paper re: Off-Airport Mitigation of Wetland Wildlife Habitat Function* provides detailed explanation of off-airport mitigation needs. The reasons for off-airport mitigation discussed in that paper are summarized as follows:

- Creation of wetland wildlife habitat near the airport would increase the hazards to passenger safety. In the United States, more than 1,700 bird strikes occur each year. Worldwide since 1995, 74 people have been killed as a result of bird strikes and four large aircraft have been destroyed. This is why FAA Advisory Circular 150/5200-33 recommends locating replacement wetlands more than 10,000 feet from runways serving turbine-engine airplanes. The FAA and the Department of Agriculture Animal Damage Control Division believe strongly that wetland wildlife habitat should not be created near Sea-Tac Airport.
- If the Port were to create wetland wildlife habitat near the airport, it would be required to manage the wetland to prevent its attraction to birds. These management activities would be directly contrary to the key purpose of creating the habitat.
- The FAA has required, as a condition of its approval of the Sea-Tac Airport improvements and as a condition of federal funding, that the Port comply with the FAA Advisory Circular and locate the replacement wetlands in Auburn, Washington. If the Port did not follow this requirement it would likely lose essential federal funding for the airport projects.
- Constructing a replacement wetland in close proximity to the airport raises liability concerns for the Port. Federal courts have found airport operators liable for failing to mitigate and warn pilots of wildlife hazards.

## 1.2 MITIGATION SITE

Off-site wetland mitigation is proposed on a 69-acre parcel located within the City of Auburn, Washington immediately west of the Green River (Figure 1). The site is vegetated with a mix of pasture grasses and forbs commonly found on abandoned agricultural land. Approximately 4.3 acres of emergent wetland is present on the site and is included in the portion of the site proposed for mitigation (0.94 acres of these wetlands would be impacted by construction of the mitigation). The wetland mitigation would be located a minimum of 200 ft west of the ordinary high water mark of the adjacent Green River.

Land uses on parcels adjacent to the site include agriculture to the north and south; undeveloped land, multi-family housing, and a drive-in theater to the west; and the Green River with riparian forest to the east. King County is proposing to construct a trail along the Green River, east of the proposed mitigation project. The site is currently zoned single-family residential (R2) by the City of Auburn and the 1995 Comprehensive Plan designation is single-family. The site is nearly level but gently slopes to the northwest, with elevations ranging from 45 ft in the northwest corner to 52 ft along the eastern property boundary. The mitigation site is within the boundaries of the Draft Mill Creek Special Areas Management Plan.

## 1.3 REVISED PROJECT IMPACTS

Since completion of the EIS, Supplemental EIS, and JARPA for the project, the wetland impact analysis for the project has been revised based on new wetland delineations on recently acquired properties (Table 1). These impacts (current as of July 14, 1998) reflect new wetland delineations in the northwest portion of the project site (known as Vacca Farm), revised wetland assessments in on-site borrow areas, and revisions to the project to avoid wetlands (the North Employee Parking Lot and proposed Runway Safety Areas for existing runways were designed to avoid wetlands).

Because acquisition of private property in the buyout area is ongoing, and wetland delineations are not yet complete, the wetland impacts of the project cannot be finalized at this time, and the wetland impacts of the project may be greater than those indicated in Table 1.

Wetland impacts presented in Table 1 indicate permanent fill impacts of the project to wetlands under jurisdiction of Section 404 of the Clean Water Act. The habitat functions of all permanent fill impacts will be mitigated at the off-site mitigation project in Auburn. Temporary impacts to wetlands in the Vacca Farm area will be mitigated on-site, as discussed below.

In the Vacca Farm area, the relocation of Miller Creek and construction of floodplain mitigation will enhance about 2.66 acres of farmed and vegetated jurisdictional wetlands. Following creek construction, these areas will be revegetated and will perform enhanced floodplain, riparian, and aquatic habitat functions compared to their existing condition (see *STIA Miller Creek Enhancement Projects Report*, August 1998).

**Table 1. Wetland impacts at Seattle-Tacoma International Airport from development projects (as of July 14, 1998).**

Wetland	Classification	Impact (Acres) <sup>1</sup>
<b><u>New Third Runway</u></b>		
9	Emergent/Forested	0.13
11	Forested/Emergent	0.46
12	Emergent/Forested	0.20
13	Emergent	0.05
14	Forested	0.19
15	Emergent	0.28
16	Emergent	0.06
17	Emergent	0.03
18	Forested	0.12
19	Forested	0.57
20	Shrub-Scrub/Emergent	0.06
21	Forested	0.22
22 <sup>2</sup>	Emergent/Shrub-Scrub	0.06
23	Emergent	0.78
24	Emergent	0.14
25	Forested	0.06
26	Emergent	0.02
28	Open Water/Shrub-Scrub	0.06
29	Forested	0.74
30	Forested/Shrub-Scrub	0.50
32	Emergent	0.05
35 <sup>2</sup>	Emergent	0.18
37 <sup>2</sup>	Forested/Shrub-Scrub	1.67
40 <sup>2</sup>	Forested	0.09
41 <sup>2</sup>	Emergent	0.08
<b><u>On-site Borrow Sources</u></b>		
B-1	Forested/Shrub	0.28
29	Forested	0.74
30	Forested/Shrub	0.88
B-5	Forested	0.08
B-6	Forested	0.55
B-7	Forested	0.03
B-9	Forested	0.05
B-10	Shrub	0.02
<b><u>South Aviation Support Area</u></b>		
52	Forested/Shrub-Scrub	1.00
53	Forested	0.60
55	Shrub-Scrub	0.04
<b>TOTAL</b>		<b>11.07</b>

<sup>1</sup> Exact areas of wetland impact are subject to changes due to final engineering design and completion of wetland delineations on private property.

<sup>2</sup> These wetlands occur on private property. The total size and impact areas are estimates based on best available information. The wetlands will be formally delineated when the Port gains the right to enter the properties.

Impacts to farmland classified as prior converted cropland (PCC) by the Army Corps of Engineers are not under Section 404 jurisdiction. However, PCC are claimed as "waters of the State" and wetland by the Washington Department of Ecology. About 0.82 acres of PCC will be filled permanently by the project improvements, while about 5.03 acres will be excavated and enhanced to create the floodplain mitigation and riparian enhancement.

#### 1.4 REVISED MITIGATION PLAN

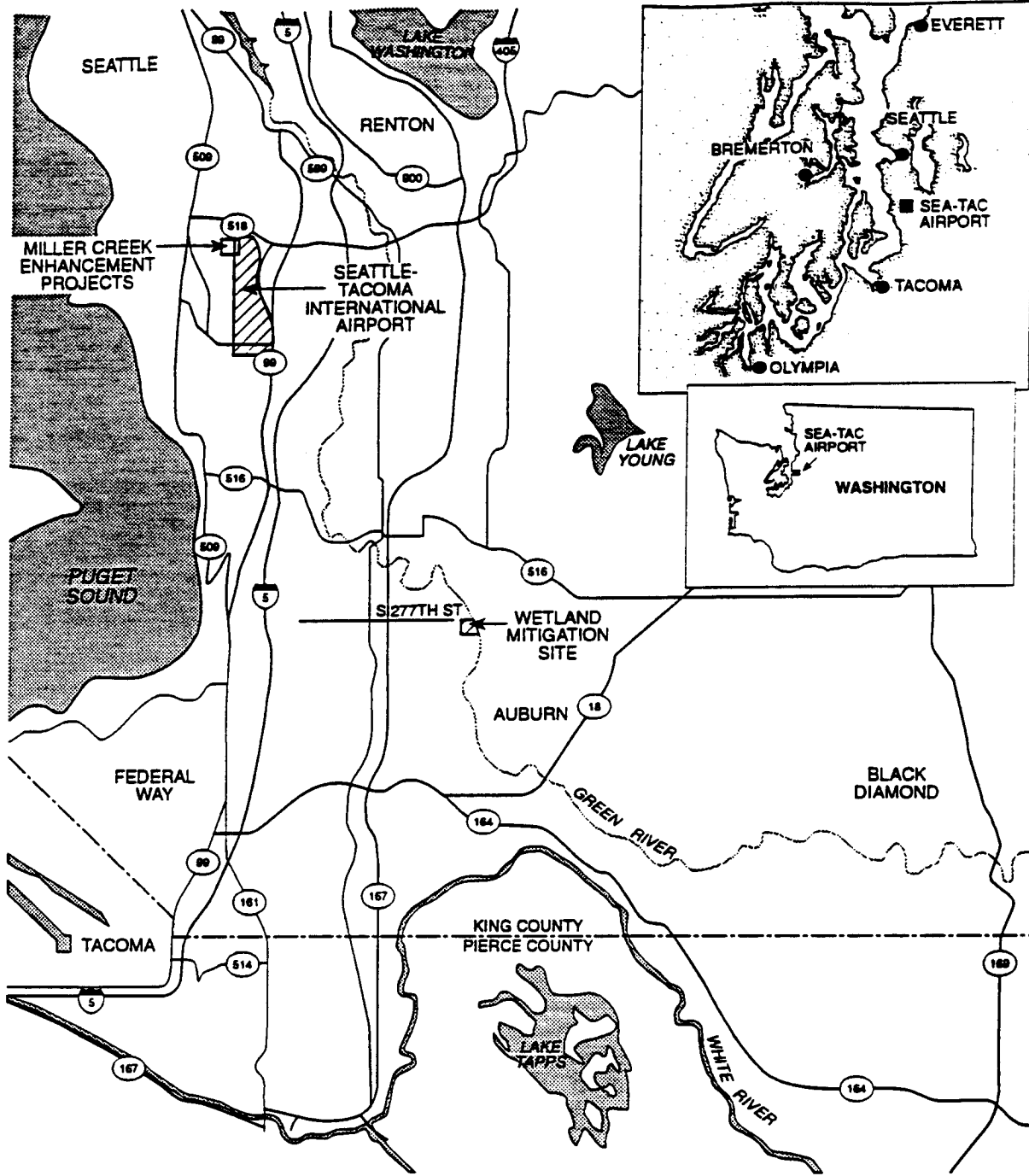
The off-site wetland mitigation site is designed to provide in-kind replacement of wetland habitat functions affected by the proposed Master Plan Update improvements. The overall goal for wildlife habitat is to compensate for unavoidable wetland impacts by in-kind replacement of habitat in an off-site location. This would be accomplished by creating a diverse replacement habitat with a net gain in functional value and acreage (these habitat functions are further explained in Section 2). Although not related to impacts of the proposed Master Plan Update improvements, additional Green River floodplain storage capacity would be created as part of the design process to assist in alleviating flooding concerns of the City of Auburn.

Previous planning documents indicated creation of up to 27-acres of wetland mitigation at the Auburn site. Based on the level of wetland impacts known on July 14, 1998, and substantial in-basin mitigation to improve riparian and aquatic habitat, off-site mitigation will be provided at a ratio of two acres of new wetland for each acre of wetland filled (2:1 mitigation ratio).

The revised summary of wetland impacts and compensatory mitigation design objectives (Table 2) reflect the new size of the mitigation project based on a 2:1 mitigation ratio and project impacts known on July 14, 1998. If wetland impacts are found to exceed those reported here, the mitigation project will be increased to maintain a compensation ratio of 2:1.

Currently there are 11.07 acres of wetland impact and the new mitigation area will provide 22.2 acres of wetland habitat. Figures showing the proposed planting associations, the USFWS wetland types to be created, and the grading plan are shown in Figures 2, 3, and 4, respectively. Figures 2-4 and Table 2 of this report replace Figures 4.2-1, 4.3-1, 4.3-2, and Table 3.1.1 respectively in the *Wetland Mitigation Plan for Proposed Master Plan Update Improvements at Seattle-Tacoma International Airport* provided with the JARPA for the project. This report replaces all other references to acres of mitigation provided at the Auburn site in the JARPA to be consistent with information presented in Table 1 and Table 2. All other elements of the mitigation plan presented in the JARPA remain valid.

As stated above, mitigation ratios for the off-site mitigation project will be two acres of replacement wetland for each acre of wetland impact (2:1) to provide about 22.2 acres of compensatory mitigation. However, mitigation ratios for in-basin mitigation will not be calculated because, while these actions replace the water quality, hydrologic, and aquatic habitat functions of impacted wetlands, they do not establish new wetlands.



Part of Seattle/Sea-Tac Airport/55-2912-01(03) 8/98

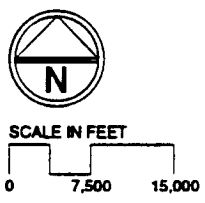
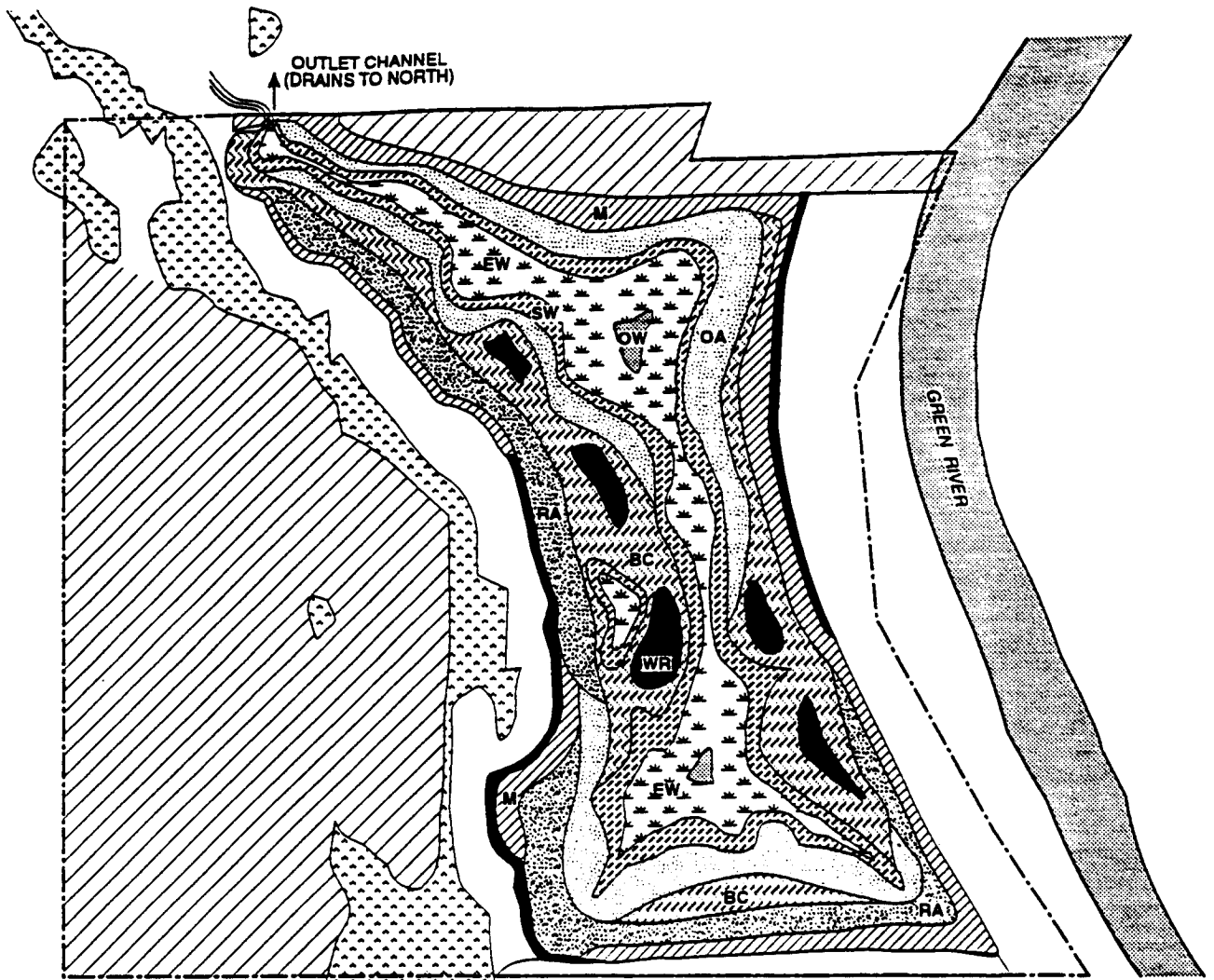


Figure 1. Location of Seattle-Tacoma International Airport and the Off-site Wetland Mitigation Project

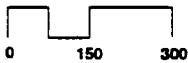




See-Tac Airport Natural Resource Mitigation/55-2912-01(03) 7/98

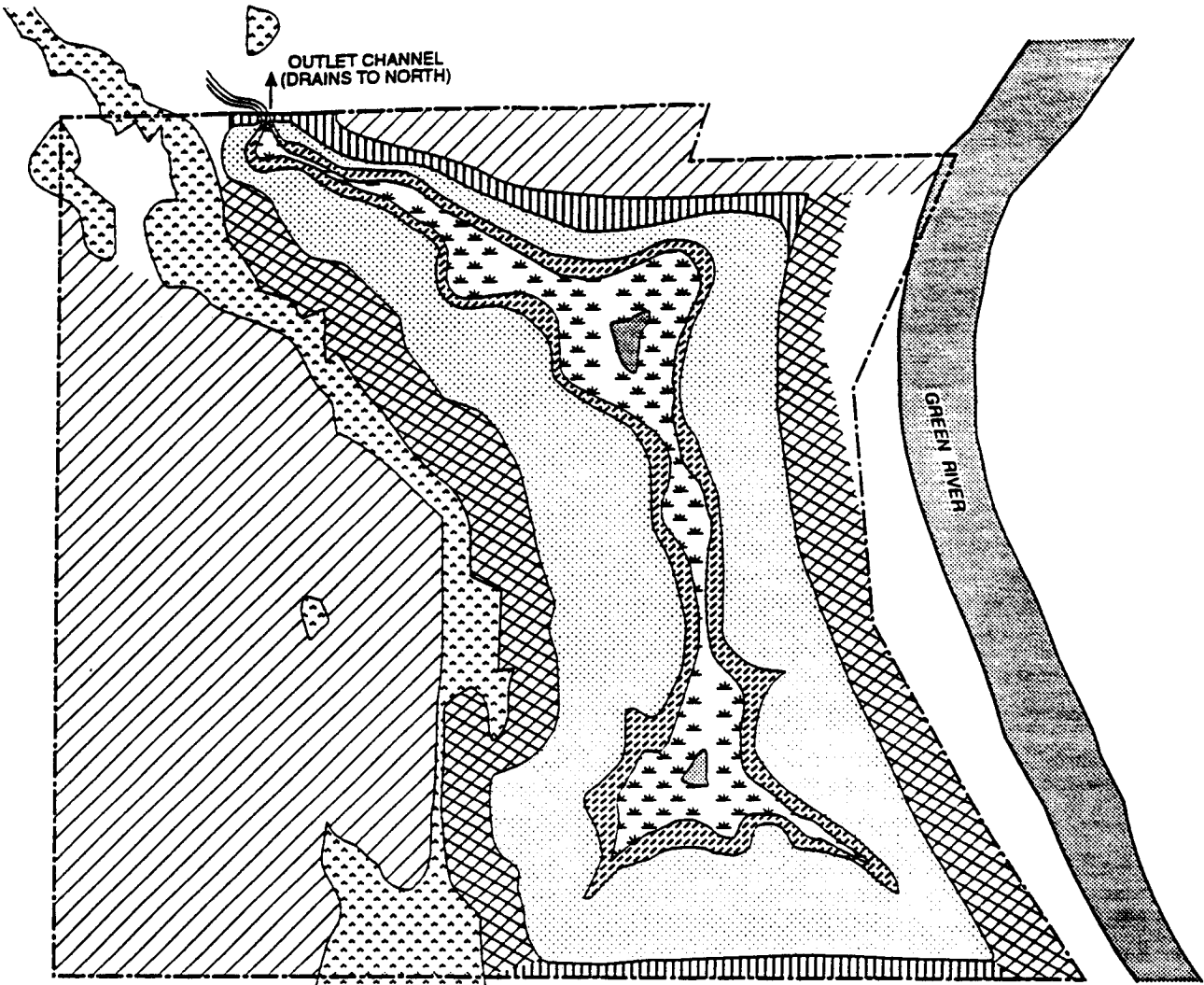


APPROXIMATE  
SCALE IN FEET

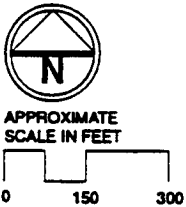










	Black Cottonwood/Willow		Existing Wetland
	Red Alder/Salmonberry		Shrub Wetland
	Oregon Ash/Slough Sedge		Open Water/Non-vegetated
	Mixed Forest		Western Red Cedar
	Reserve Area (for future development)		

**Figure 2.**  
**Proposed Plant Associations for**  
**the Off-site Wetland Mitigation Site**

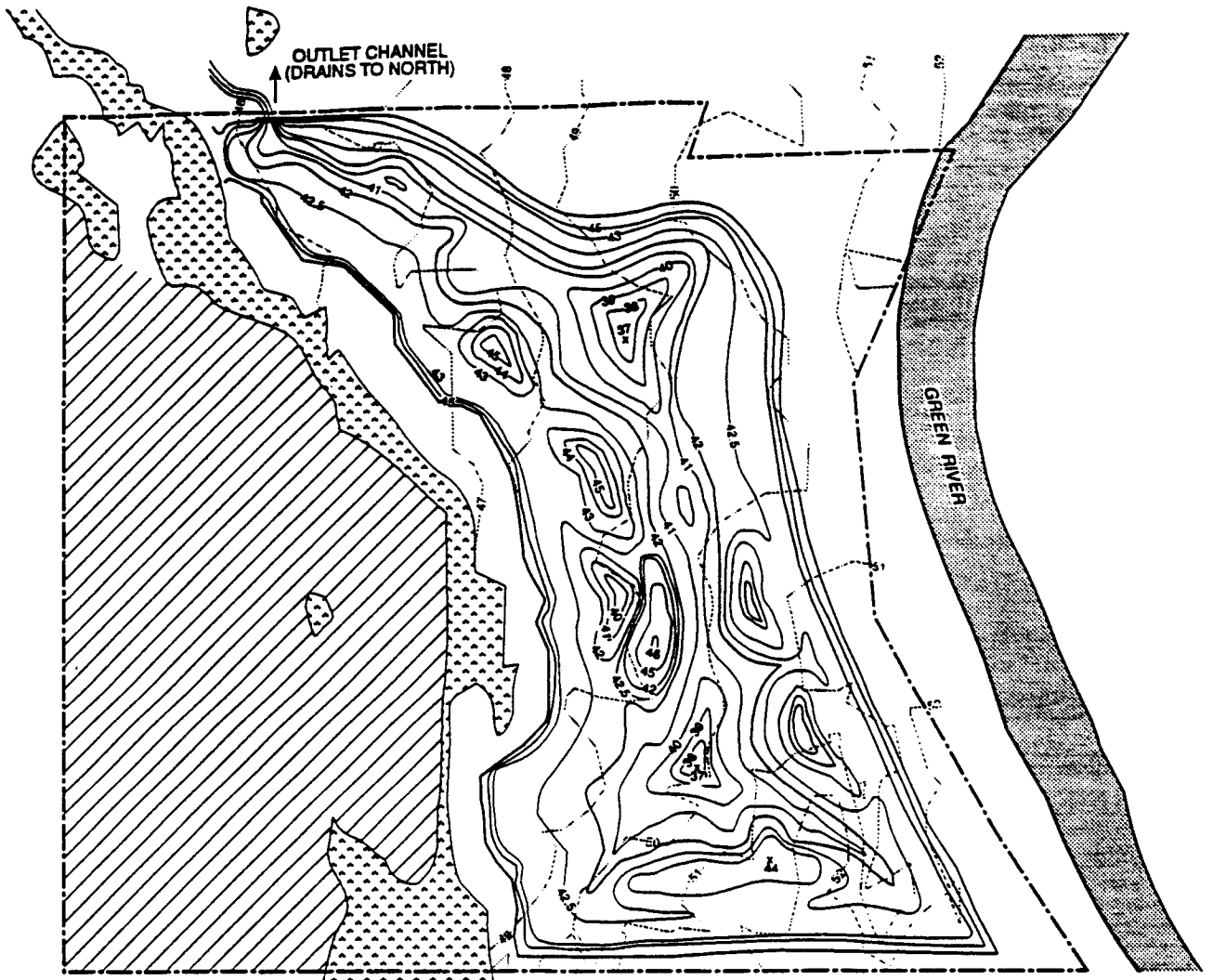


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-  Forested Wetland
-  Shrub Wetland
-  Emergent Wetland
-  Open Water/Wetland
-  Forested Upland Buffer
-  Herbaceous Upland Buffer
-  Existing Wetland
-  Reserve Area (for future development)

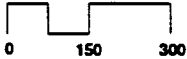
**Figure 3.**  
**Proposed Wetland Classes**  
**and Buffer Vegetation Types for**  
**the Off-site Wetland Mitigation Site**



See-Tac Airport Natural Resource Mitigation/66-2912-01(03) 7/88



APPROXIMATE  
SCALE IN FEET



- 50 — Proposed Grade
- 50 — Existing Grade
- Existing Wetland
- Reserve Area (for future development)

**Figure 4.**  
**Off-site Wetland**  
**Mitigation Grading Plan**

**Table 2. Summary of design objectives for the proposed off-site mitigation as of July 14, 1998.**

Project Impact	Design Objectives	Potential Acreage Provided <sup>1</sup>	Compensation Ratio <sup>1</sup>
Fill of 6.62 acres of forested wetland and loss of associated wildlife habitat.	Provide in-kind replacement of forested wetland vegetation cover and increase overall wildlife habitat function.	13.24 acres of forested wetland	2.0:1
Fill of 0.92 acre of shrub wetland and loss of associated wildlife habitat.	Provide in-kind replacement of shrub wetland vegetation cover and increase overall wildlife habitat function.	1.84 acres of shrub wetland	2.0:1
Fill of 3.53 acres of emergent wetland and loss of associated wildlife habitat.	Provide in-kind replacement of emergent wetland vegetation cover and increase wildlife habitat function.	7.06 acres of emergent wetland	2.0:1

<sup>1</sup> Acreages of mitigation and compensation ratios are identified as potential since verification of wetland impacts is in process.

## 2. SUMMARY OF OFF-SITE MITIGATION HABITAT FUNCTIONS

Construction of the forested, shrub, and emergent wetlands in Auburn would create suitable habitat for a variety of wildlife species to replace habitat functions lost at STIA. Habitat structure and availability would change as vegetation matures over the next several decades, and the wildlife species using the site are expected to change over time.

Post-construction habitat structure in proposed forested wetlands would be similar to regenerating forest, and would develop mature forest habitat attributes after several decades. The shrub understory would enhance the development of habitat structure. Songbird use, in early stages of habitat development, would include foliage and bark-gleaning species (kinglet, chickadee, bushtit, vireo). In later years, Oregon ash, vine maple, willow, red cedar, and hemlock seed production would be used by additional songbird species. Small mammals would likely forage on the forest floor for seeds and invertebrates, even though optimal habitat conditions would not occur for one or more decades. As a tree canopy begins to develop, it would provide nesting habitat and cover for predator avoidance.

Post-construction habitat structure in shrub wetlands would generally be similar habitat provided by forested systems during the first several years of development. However, since shrub communities would periodically be flooded, ground-dwelling animals would be less common. The shrub community would reach functional maturity in about 15 to 25 years following planting.

Emergent communities would provide resting and foraging habitat for shore and water birds within one year of planting. Following two to three years, most of the intended wildlife functions should be present, and following five to ten years, relatively mature communities should be present.

Tree-nesting songbirds (such as thrushes, vireos, and warblers) are expected to use horizontal branches for nesting when the canopy closes enough to provide cover. Leaf litter and forest detritus would begin to accumulate, providing habitat for the invertebrates that amphibians (such as ensatina), small mammals, and ground-foraging birds feed on. Small mammals, in turn, are likely to become food for predators, such as barred owl and red-tailed hawk. Over the course of several decades, competition for light, or disease would result in mortality. Dead and decaying trees would provide woody debris and snag habitat for flickers, woodpeckers, and small cavity-nesting birds.

The shrub and emergent wetlands should reach stable habitat conditions earlier than the forested wetland community. Shrub wetland communities should produce forage and nesting opportunities within two to ten years. Swainson's thrush and Wilson's warblers use moist shrub habitats for nesting and foraging. Berries produced by salmonberry, elderberry, and red-osier dogwood are used by several songbird species to supplement fall and winter diets. Shrews and other small mammals would consume insect and aquatic invertebrates that thrive in shrub and emergent wetlands. Wading birds, such as great blue heron, can feed on small mammals and amphibians.

Although flooded emergent wetlands can provide substantial forage opportunities for ducks, habitat use would vary with proximity to upland predator cover. Waterfowl, which are wary of dense shrubs that allow predators to approach undetected, prefer interspersed flooded emergent vegetation and open water. Slough sedge, spike rush, and scouring rush are all species

preferred by dabbling ducks and geese during migration. Narrow-leaf burreed is preferred by dabblers and migrating wood ducks. As decaying vegetation builds up in flooded areas, shovelers, pintails and other diving species could use growing populations of plankton, algae, aquatic insects, and snails. Additionally, some amphibious species, such as Pacific giant salamander, northwestern salamander, and rough-skinned newt commonly migrate through terrestrial habitats and could use the mitigation site.