Biological Assessment

Agency: USDI – U. S. Fish and Wildlife Service

Project: Smith & Bybee Lakes

Basin: **Willamette River**

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I. INTRODUCTION

Federally funded activities that may affect listed species, or their habitats require a Biological Assessment (BA) to be completed as part of the Endangered Species Act consultation and Magnuson-Stevens Act (for adverse affects only) processes to determine their potential effects on those listed species. The Biological Assessment process is intended to conduct and document activities necessary to ensure that proposed management actions will not jeopardize the continued existence or cause adverse modification of critical habitat for chinook salmon (Upper Willamette River ESU) (*Oncorhynchus tshawytscha*). The following describes the proposed action and substantiates our determination of May Affect, Not Likely to Adversely Affect. We request the National Marine Fisheries Service concur with this determination.

II. PROJECT DESCRIPTION, LOCATION AND ACTIONS

The U.S. Fish and Wildlife Service (Service) has provided funding from the North American Wetlands Conservation Fund through a grant to the Columbia Land Trust. The restoration of Smith and Bybee Lakes Wildlife Area is a part of that grant. The project occurs on land owned by Metro (Regional Parks and Greenspaces Department). Restoration design and construction will be delivered by Ducks Unlimited, Inc. (DU).

The proposed action includes the removal of an existing dam and flap gate, and the installation of a large, multi-celled water control structure to accommodate fish passage and habitat management. The primary objective of the project is to restore to the maximum extent possible the natural hydrology to these large wetlands, with the understanding that during some periods of the year water will need to be physically retained within the wetlands for vegetation management. The project is located in Multnomah County, and drains into Columbia Slough, before entering the Willamette River. The Smith & Bybee Lakes Wildlife Area encompasses over 1600 acres of wetlands within: T 2N, R 1W, S 25; T 2N, R 1W, S 36; T 2N, R 1E, S 32; T 2N, R 1E, S 31; T 2N, R 1E, S 30; T 1N, R 1E, S 5; T 1N, R 1E, S 6. The project is planned for installation during August of 2002 to avoid disturbance to any rearing salmonids. A location map and plans are attached.

The project will restore approximately 1,600 acres of seasonal emergent and forested wetland habitat to the two wetlands (Smith Lake and Bybee Lake). These water bodies are connected, and drain via the existing flap gate into the North Slough arm of the Columbia Slough. At present, the wetlands are

physically disconnected from the North Slough except during catastrophic flood events. Water can flow out through the flap gate when the weir is open, but no water can flow into the wetlands from the slough. Historically, the entire wetland complex was seasonally and tidally inundated, and featured a mosaic of forested and emergent floodplain wetlands.

The historic hydrologic regime was characterized by winter flooding that receded in late winter and early spring. Late spring rains and snowmelt caused water to rise again in the spring freshet. Water levels would drop dramatically in summer with the dry weather. Modifications to this hydrologic regime over the past 70 years, such as construction of dams and dikes and filling with dredge spoils, have dramatically changed the frequency and duration of flooding in the region's wetlands. The first significant alteration was the construction of major dams on the Columbia River. The use of these dams to produce hydroelectric power, store water and reduce flooding drastically altered the natural hydrological cycles in the lower Columbia River ecoregion, including Smith and Bybee lakes. Although the lakes drain into the Willamette system, the confluence of Columbia Slough and Willamette River is adjacent to the Willamette's confluence with the Columbia River. Thus the lakes are influenced by the Willamette and Columbia rivers' hydrology.

The most recent significant alteration of the Smith and Bybee lakes system occurred with the construction of a dam in 1982 that separated the lakes from the North Slough arm of the Columbia Slough, and thus the Willamette River. The dam has been modified or replaced twice, but has always been used to retain water in the lakes. Since 1982, the lakes have essentially functioned as reservoirs, held at a static water level. These hydrologic alterations have significantly limited waterfowl nesting success, while optimizing conditions for the spread of exotic plants such as reed canarygrass. The constant inundation also destroyed more than 120 ha of bottomland forest.

Through our partnership with Metro and DU, we have designed this restoration proposal to allow free and open seasonal and tidal connectivity throughout much of the year, while providing a mechanism to improve wetland habitat by controlling water levels from winter into summer. This will be accomplished by placing stop logs into the water control structure during those periods when floodwaters recede prematurely. This strategy has proven successful in controlling reed canarygrass, encouraging native emergent vegetation (smartweed, wapato, etc) and reducing waterfowl nest flooding.

The restoration design has also accounted for the presence of chinook salmon during winter and spring months, and addresses both their need for off-channel refugia and over-wintering habitats. During the months when the structure is completely open, juvenile salmonids will have free ingress/egress opportunity. At any time when the structure is operating (stop logs in place to retain water within the wetlands), the fishway will be flowing, maintaining free ingress and egress. Metro staff will be responsible for operations and maintenance, and initially will be monitoring the structure on a weekly basis.

The primary purpose for water management is to allow Metro to mimic the historic water regime, particularly the spring freshet, by prolonging the recession of floodwaters out of the wetlands. The long drawdown period simulates historic conditions by slowly exposing the shallow areas as mudflats late in the spring, during the warming period that favors native plant communities. This is crucial to restoring native vegetation and in controlling reed canarygrass because the latter is a cool-season plant that starts growing earlier in the year than the desired native emergent plants. An unmanaged wetland would drain in February, and the subsequent reed canarygrass invasion would effectively outcompete native wetland species, resulting in a monoculture.

We believe that this management strategy will improve wetland habitat and water quality while allowing out-migrating smolts to get into the wetlands throughout the winter and spring. Downstream passage at this structure will be provided at all times.

III. PROJECT OBJECTIVES

- Restore wetland vegetation communities while reducing or eliminating exotic plants that have taken over the area.
- Improve wetland habitat and water quality by restoring wetland function.
- Provide overwintering and refugia habitat to salmonid species within the wetlands.

IV. DESCRIPTION OF ESA / MSA SPECIES

This proposed restoration project would occur in an area known to have been used as over-wintering and off-channel refugia habitat by anadromous chinook salmon, specifically the Upper Willamette River ESU. Chinook salmon typical rear in large streams, migrating to the ocean where they live for an average of 3 to 4 years before returning to their natal streams to spawn. Timing of the return to their natal streams varies depending upon the run. In this area, the spring/summer chinook return beginning in February through late spring and spawn beginning in August through winter. Juveniles remain in freshwater from 1 to 18 months before migrating to the ocean (Bjornn and Reiser 1991).

Fishman (1987) documented chinook presence throughout Smith & Bybee Lakes in spring 1986. They noted that fish caught in the lakes were larger than those in the adjacent slough, possibly indicating high rates of growth over a short period of residence in the wetlands. The chinook had entered the lakes when floodwaters overtopped the levee between North Slough and Bybee Lake. The juveniles were able to leave the lakes through the structure in place at the time.

Habitat conditions preferred by chinook salmon involve cool water temperatures of 39 to 57 degree Fahrenheit (Emmett et al. 1991), low turbidity, high levels of dissolved oxygen, gravel sizes between 1.3 and 10.2 cm in size for spawning (Bjornn and Reiser 1991), and stream side vegetation for cover from predators. Environmental factors can affect the distribution and abundance of juvenile salmonids throughout a stream or drainage. Factors to which fish respond at specific locations in a stream are velocity, depth, substrate, cover, predators, and competitors (Bjornn and Reiser 1991).

V. DESCRIPTION OF ACTION AREA

The USDA Natural Resources Conservation Service evaluated whether there could be effects from Federal actions on the above species and their habitat, based on the 1988 Oregon Department of Water Quality 303(d) list, and Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale (NMFS, 1996).

Columbia Slough Watershed Conditions

Water Quality

Stream Temperature –The Oregon 1998 303(d) identified temperature as limiting within Columbia Slough: Temperatures above the Oregon State Standard of 16°C are above the temperature ranges for proper salmonid incubation, rearing and spawning (Bjornn and Reiser 1991). Stream temperatures are considered **Not Properly Functioning.**

Sediment The Oregon 1998 303(d) list identified Columbia Slough as having concerns regarding sediment. Due to the amount of development and degradation along the slough, this element is identified as **Not Properly Functioning.**

Chemical Contaminants/Nutrients: The Oregon 1998 303(d) list identified Columbia Slough as having concerns with chemical contaminants and/or nutrients. Due to the concerns around the area of the project, this function is considered to be **Not Properly Functioning**.

Fish Habitat Elements

Fish Distribution and Habitat Access – Upper Willamette River ESU chinook salmon over winter in this area (C. Baker, pers.obs.). Biologists from DU and the City of Portland conducted presence/absence surveys in December of 2001 and found chinook in the project area. The existing structure and tidegate constitute a passage barrier, blocking access to the wetlands; therefore; this element is considered **At Risk**.

Substrate – No data was available for this element and it was not listed as a concern on DEQ's 303(d) list. However, due to the amount of development in the area it is suspected that the substrate is fairly embedded. Therefore it is considered **Not Properly Functioning**.

Large Woody Debris and Pool Quality and Frequency – While some riparian still exists along lower Columbia Slough, the channel is confined between steep, armored banks with almost no variation in habitat. This element is considered **Not Properly Functioning.**

Off-Channel Habitat and Refugia - Currently there is a lack of refugia in the area due to the land alterations that have occurred throughout the basin. The area has been channelized, wetlands filled, and the wetlands physically disconnected from the slough. Banks have been hardened to control bank erosion and stream channel movement. Therefore, this element is **Not Properly Functioning**.

Channel Conditions and Dynamics

Width to Depth Ratio – Excessive channelization in the area that has altered channel conditions, narrowing the stream. This element is considered **Not Properly Functioning**.

Streambank Condition - The banks of Columbia Slough are steep, and mostly armored with riprap. This element is considered **Not Properly Functioning**.

Floodplain Connectivity - The area has historically been altered for industrial development. Channels were straightened, wetlands filled, and streambanks diked, reducing the connection the river had to the floodplain. Backwater areas that provide critical habitat for many species are limited. This element is considered **Not Properly Functioning**.

Flow/Hydrology

Peak Flow/Vegetation - Significant alterations in hydrology have occurred over the past 75 years, which have drastically changed local biota affecting beneficial uses, such as wildlife and. This element is considered **Not Properly Functioning**.

Drainage Network Increase - The area has been highly developed for industrial purposes. The number of roads has increased within the watershed creating more "streams" running down ditches along side the road. These "streams" have the potential to carry road sediment and chemicals to watercourses.

There are several roads adjacent to the stream as well as in the uplands. This element is considered **Not Properly Functioning.**

Watershed Conditions

Road Density & Location - The area has been highly developed for industrial uses. The number of roads has increased within the watershed well beyond 2.5 mi/mi^2. There are several roads adjacent to streams as well as in the uplands. This element is considered **Not Properly Functioning.**

Disturbance History & Regime - The lower Willamette River has been highly modified to accommodate agricultural needs historically. Recreation has become a more recent disturbance in the basin. The system has been simplified and is lacking riparian habitat, instream channel complexity and off-channel habitat. Therefore, this element is considered **Not Properly Functioning.**

Riparian Reserves - The riparian area adjacent to a stream or wetland is important in providing wildlife habitat, as well as bank and channel stability (the roots of riparian plants and trees hold soil in place). In many cases, this vegetation also shades the stream and regulates water temperatures. In valleys with steep channel gradients, this vegetation can provide upper bank stability. The riparian areas were historically cleared and filled for industrial uses. This element is considered **Not Properly Functioning**.

Expected Changes Due to Project Implementation:

Water Quality

Stream Temperature – Water temperatures will not change as a result of this project; this element will be **maintained**.

Sediment – This project will increase water exchange between the slough and the wetlands, however this is not expected to noticeably affect sediment characteristics in the slough; this element will be **maintained**.

Chemical Contaminants/Nutrients – This project will not add any additional chemicals or nutrients to the area; therefore, this element will be **maintained**.

Fish Habitat Elements

Fish Distribution and Habitat Access – The project has been designed to allow free and open connection between the slough and the wetlands during portions of the winter and spring. The structure has a pool-chute style fishway designed into it that will maintain fish passage while water is being retained within the wetlands. This project will **restore** fish distribution and habitat access.

Substrate – As with sediment, this project will not affect the substrate; this element will be **maintained**.

Large Woody Debris and Pool Quality and Frequency – This project will be restoring access to a huge wetland complex with forested areas and large woody debris, increasing the potential habitat for rearing chinook salmon. This habitat element will be **maintained** with the implementation of this project.

Off-Channel Habitat and Refugia - This project will restore access to 1800 acres of off-channel refugia for juvenile chinook and other aquatic and terrestrial species. The wetland will remain with water for longer

periods of time, providing shelter and protection from higher flows found in larger river systems. Because of the large size of this project, these elements will be **restored** as a result.

Channel Conditions and Dynamics

Width to Depth Ratio – This project will maintain current width to depth ratios. There is not instream channel work to be implemented that would change these ratios; therefore, the element will be **maintained.**

Streambank Condition - This project may help to improve channel conditions through the increase in native wetland vegetation communities. This element will be **maintained.**

Floodplain Connectivity - This project will help to improve floodplain connectivity through the 35 foot wide opening, and given the significant scale of this project this element will be **restored.**

Flow/Hydrology

Peak Flow/Vegetation – Peak flows will be maintained through the implementation of this project. Vegetation will be changed with the decrease of Reed's canary grass and the establishment of native vegetation. This element will be **maintained** through implementation of this project.

Drainage Network Increase - This project will not change the drainage network in the area; therefore, this element will be **maintained.**

Watershed Conditions

Road Density & Location - This project will not change the drainage network in the area; therefore, this element will be **maintained.**

Disturbance History and Regime - This project will help to connect the floodplain to the river and help to re-establish wetland functions. This will help to reverse some of the past disturbance that has taken place in the area and watershed. However, this element, at the basin scale, will be **maintained.**

Riparian Reserves – This project will improve the riparian areas by decreasing reed canarygrass and allowing for the establishment of native vegetation. This element will be **maintained.**

Table 1. Checklist for documenting environmental baseline and effect of proposed action(s) on relevant indicators for the Lower Willamette River area.

	Environmental Baseline for Lower Willamette River			Effects of Conservation Practice		
INDICATORS	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore[1]	Maintain[2]	Degrade[3]
Water Quality: Temperature			X		X	
Sediment			X		X	
Chem. Contam./ Nutrients			X		X	
Habitat Access: Physical Barriers		X		X		
Habitat Elements: Substrate			X		X	
Large Woody Debris			X		X	
Pool Frequency and Quality			X		X	
Large Pools			X		X	
Off-channel Habitat			X	X		
Refugia			X	X		
Channel Cond. &Dynam: Width/Depth ratio			X		X	
Stream bank Condition			X		X	
Floodplain Connectivity			X	X		
Flow/Hydrology: Peak/base flows			X		X	
Drainage Network Increase			X		X	

	Environmental Baseline for Lower Willamette River			Effects of Conservation Practice		
INDICATORS	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore[1]	Maintain[2]	Degrade[3]
Watershed Conditions: Road Density & Location			X		X	
Disturbance History			X		X	
Riparian Conservation Areas			X		X	
Disturbance Regime			X		X	

[1]"Restore" means the action(s) will result in acceleration of the recovery rate of that indicator.
[2]"Maintain" means that the function of an indicator does not change by implementing the action(s) or recovery will continue at its current rate.

[3]"Degrade" means to change the function of an indicator for the worse.

VI. EFFECTS OF THE PROPOSED ACTON ON PROPOSED/LISTED SPECIES OR PROPOSED/LISTED DESIGNATED CRITICAL HABITAT

This proposed restoration project would occur in an area known to be used as over-wintering and off-channel refugia habitat by anadromous chinook salmon, specifically the Upper Willamette River ESU. This area has also been determined to be Essential Fish Habitat for chinook salmon and is protected under the Magnuson-Stevens Act. DU and the City of Portland conducted some remedial presence/absence surveys, and documented chinook presence in North Slough in December 2001, which was a normal winter. The timing of construction will be in August, when conditions will be lethal to salmonids, and thus none will be present. The project, once completed will have beneficial effects to chinook salmon in the form of enhanced rearing habitat and access. We conclude that the proposed restoration plan **May Affect, but is Not Likely to Adversely Affect** the Upper Willamette River spring/summer chinook salmon ESU.

Sources and References

Bjornn, T.C. and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. American Fisheries Society Special Publication 19:83-138.

Fishman Environmental Services. 1987. Smith and Bybee Lakes Environmental Studies. Port of Portland and City of Portland, Portland, Oregon.

National Marine Fisheries Service. 1996. Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale. NMFS, Portland, OR.

National Marine Fisheries Service 1999. Biological Opinion of the Oregon Conservation Reserve Enhancement Program. June, 1999. pp. 96.

Oregon Department of Environmental Quality. 1998. Oregon's Approved 1998 Section 303(d) List of Water Quality Limited Waterbodies.

DICHOTOMOUS KEY FOR MAKING ESA DETERMINATION OF EFFECTS FOR NMFS SPECIES

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

   NO ..... No effect

   (YES...) ..... May affect, go to 2

2. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators (from table 2)?

   YES..... Likely to adversely affect

   (NO) ..... Go to 3

3. Does the proposed action(s) have the potential to result in "take"[1] of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

   A. There is a negligible (extremely low) probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of habitat.....
   .....(... Not likely to adversely affect)

   B. There is more than a negligible probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of habitat. ..... Likely to adversely affect

[1] "Take" - The ESA (Section 3) defines take as "to harass, harm, pursue, hunt, shoot, wound, trap, capture, collect or attempt to engage in any such conduct". The USFWS (USFWS, 1994) further defines "harm" as "significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering", and "harass" as "actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering".

DOCUMENTATION OF EXPECTED INCIDENTAL TAKE

Name and location of action(s):_XXXXXXX_____ Species: Upper Willamette River chinook___

1. The proposed action may result in incidental take through which of the following mechanisms (underline as appropriate)?

   Harm: Significant impariment of behavioral patterns such as breeding, feeding, sheltering, and others (identify).

   Potential to impair outmigration of smolts.

   Harass: Significant disruption of normal behavior patterns which include, but are not limited to, breeding, feeding, sheltering, or others (identify).

   Pursue, Hunt, Shoot, Would, Capture, Trap, Collect.

   Potential to trap smolts behind water control structures as water is released.

2. What is the approximate duration of the effects of the proposed action(s) resulting in incidental take?

   The fish passage structure will be open throughout the year, facilitating unrestricted egress from the wetland. During the winter, and again during spring runoff events, flooding will connect the North Slough and the wetlands (Smith and Bybee lakes). It is only after water levels drop that fish will rely solely on the passage structure for safe out-migration. Drawdown will begin in early June and continue through late July or early August; fish will have the opportunity to emigrate before and during drawdown. It is believed that most of the salmonids will have left the system prior to the initiation of drawdown.

3. Which of the following life stages will be subject to incidental take (underline as appropriate)?

   Fertilization to emergence (incubation)

   Juvenile rearing to adulthood

   Adult holding and overwintering

   Spawning

   Outmigrating Smolts

4. What is the location of the expected incidental take due to the proposed action(s)?

   Basin and watershed:

Stream reach and habitat units: The two lakes/wetlands will drain via North Slough into the Columbia Slough before entering the Willamette River. The areas where the lakes drain into the slough channels will be the location of potential take.