GOAL STATEMENT AND OBJECTIVES

The goal statement and objectives which follow are the basic expression of the Management Plan's policy direction. This overall direction has been set by the Advisory Committee after long and careful consideration of the Environmental Studies, previous planning efforts, an assessment of potential impacts, and the stated preferences of interested parties and organizations. As provided by City of Portland Code (Chapter 33.635, Environmental Concern Zone), the Management Plan provides a set of recommendations which may be implemented with certainty and provides a mechanism for handling exceptions and modifications. The goal and objectives have been used as the basic principles guiding the formulation of the Management Plan's recommended set of land uses, activities and projects for the Smith and Bybee Lakes area.

Goal Statement

The goal of the Management Plan is to protect and manage the Smith and Bybee Lakes area as an environmental and recreational resource for the Portland region. The lakes will be preserved as historical remnants of the Columbia River riparian and wetlands system. They will be maintained and enhanced, to the extent possible, in a manner that is faithful to their original natural condition. Only those recreational uses that are compatible with environmental objectives of the Management Plan will be encouraged. Smith Lake and adjacent uplands will be the principal location for recreational activities. Bybee Lake will be less accessible. Its primary use will be as an environmental preserve.

Objectives

1 Control water level in order to manage the lakes' environmental system.

2 Provide for and maintain habitat diversity representative of lower Columbia River floodplain wetlands.

3 Maintain and enhance water quality in the lakes.

4 Implement a monitoring program to assure early detection of potential environmental problems, and to quantify management programs.

5 Provide access to Smith and Bybee Lakes which supports appropriate types and levels of recreation.

6 Encourage appropriate types and levels of recreational activities which are compatible with environmental objectives.

7 Incorporate Smith and Bybee Lakes into the Metropolitan Wildlife System Project, Metro's Regional Natural Areas Program, and the 40 Mile Loop recreation trail system.

8 Develop upland areas in a manner which is compatible with the preservation of the wetlands and use of the lakes for passive recreation.

Society of Wetland Scientists DRAFT Position Paper on the Definition of Wetland Restoration

It is the Society's objective to increase public understanding of wetland issues and promote sound public policy through the development and communication of position papers that are based upon the best available scientific information.

Position Statement:

Wetland Restoration is defined as: actions taken in a converted or degraded natural wetland that result in the reestablishment of ecological processes, functions, and biotic/abiotic linkages and lead to a persistent, resilient system integrated within its landscape.

Scale of Issue:

International

Background:

In the last part of the Twentieth Century, a significant amount of money and time was dedicated to re-instating more natural conditions in a variety of ecosystems. Despite an overwhelming sense that such action is critical to the well-being and recovery of many systems, the word "restoration" is used very loosely in most scientific and political arenas. As the science of restoration is young and we are still learning how it should be applied, the need for a clear definition is critical to identify the framework within which advances will be made.

As a professional organization for many of the scientists currently involved in restoration, it is appropriate for the Society of Wetland Scientists (SWS) to provide guidance as to the meaning of the term "wetland restoration." Current ambiguity in the use of this word has led to a broad range of projects being funded and endorsed under its umbrella. In addition, it has led to difficulty in the communication of ideas within and among academia, the private sector, regulatory agencies, lawmakers, and the public. The advancement of any field depends on clarity and consistency in the use of key terms. A clear, practical definition of restoration is needed to develop a common understanding between all those working toward the restoration of ecosystems.

Scientific Considerations:

Many definitions of restoration have been written over the past decade or so. Most indicate that restoration in some way repairs anthropogenic damage to a natural system (Lewis 1989, National Research Council 1992, Jackson et al. 1995, Gersib 1997, Kauffman et al. 1997). The discrepancy between these different definitions lies in the details of what is repaired and the final condition to which it is repaired. Over the past decade, both our scientific and practical understanding of ecological restoration and the number of projects implemented have grown dramatically. In this time, our concept of restoration has evolved to the point that now, in writing a definition, there are a few key elements that need to be conveyed in order to define the term adequately and usefully.

1. *Restoration is the reinstatement of driving ecological processes.* The fundamental forces that maintain wetland ecosystems are the geomorphic setting, physical processes (e.g., hydrology, fire, sediment movement), biological processes (e.g., competition, decomposition, predation), and biogeochemical processes (e.g., nutrient cycling). These fundamental forces interact to perform the ecological functions and produce the structure that we associate with wetlands. As actively installing the biotic structure of a system may not always be necessary (Mitsch et al. 1998) or adequate to restore the functions of the system (Zedler 1996, Malakoff 1998), restoration needs to address these root forces first. The National Research Council (1992) eloquently summarized this in their approach to restoration of fluvial systems, which favors establishment of the natural sediment and water regime of a river followed by engineering of the natural geometry of the system only if restoring the sediment and water regime alone does not take care of this, and finally introduction of the biotic community only if the previous efforts do not lead to its establishment.

2. *Restoration must be integrated with the surrounding landscape.* Successful restoration demands that consideration be given to the landscape setting in which the system occurs. It is this landscape that underlies many of the large-scale factors and fundamental forces (e.g., water and sediment movement, geomorphology, fire regimes) that are essential to the formation and long-term maintenance of ecosystems (Brinson 1993, Bedford 1996). Restoration projects that address the effects of alterations that have occurred within the landscape as a result of human development can deal directly with the causes of degradation rather than just the symptoms. As understanding of landscape ecology and its importance to restoration develops, it be-

Position Paper, continued

comes increasingly clear that the integration of restoration projects with the landscape context is essential to producing ecosystems that function in a dynamic and resilient manner.

3. ***The goal of wetland restoration is a persistent, resilient system.*** The concept of a persistent, resilient system is gaining definition through the development of the field of ecological engineering, where a primary objective of designing and building ecosystems is to produce a system that is not static but rather has enough of the physical and biological processes intact that it can respond to disturbances without human intervention (Mitsch 1998). The practical realities of conducting restoration in the modern world often necessitate human involvement to maintain an ecosystem (e.g., prescribed burning or the removal of non-native species). In addition, implementation of adaptive management as we learn how to better conduct restoration requires active management and monitoring of a site. Acknowledging these caveats and limitations in the pursuit of a wholly persistent, resilient system, the ultimate goal of restoration should be a system that is dynamic and that can function without human intervention.

4. ***Wetland restoration should result in the historic type of wetland but may not always result in the historic biological community and structure.*** The importance of maintaining the historic diversity of wetlands across a landscape requires that the geomorphology and hydrologic regime of a restored wetland match that present historically. However, this will not always lead to re-instatement of a historic or specific biological structure. While the essence of wetland restoration is putting it back to a former or original state, a variety of factors (e.g., successional stage, seed bank conditions, disturbance history, etc.) may prevent establishment of the communities and biological structure present prior to human disturbance even when the driving processes have been restored.

5. ***Restoration planning should include the development of structural and functional objectives and performance standards for measuring achievement of the objectives.*** This is the foundation of adaptive management. It is critical that we learn from our successes and failures, particularly in the relatively new field of wetland restoration.

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National Research Council. 1992. Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy. Washington DC, USA. National Academy Press.

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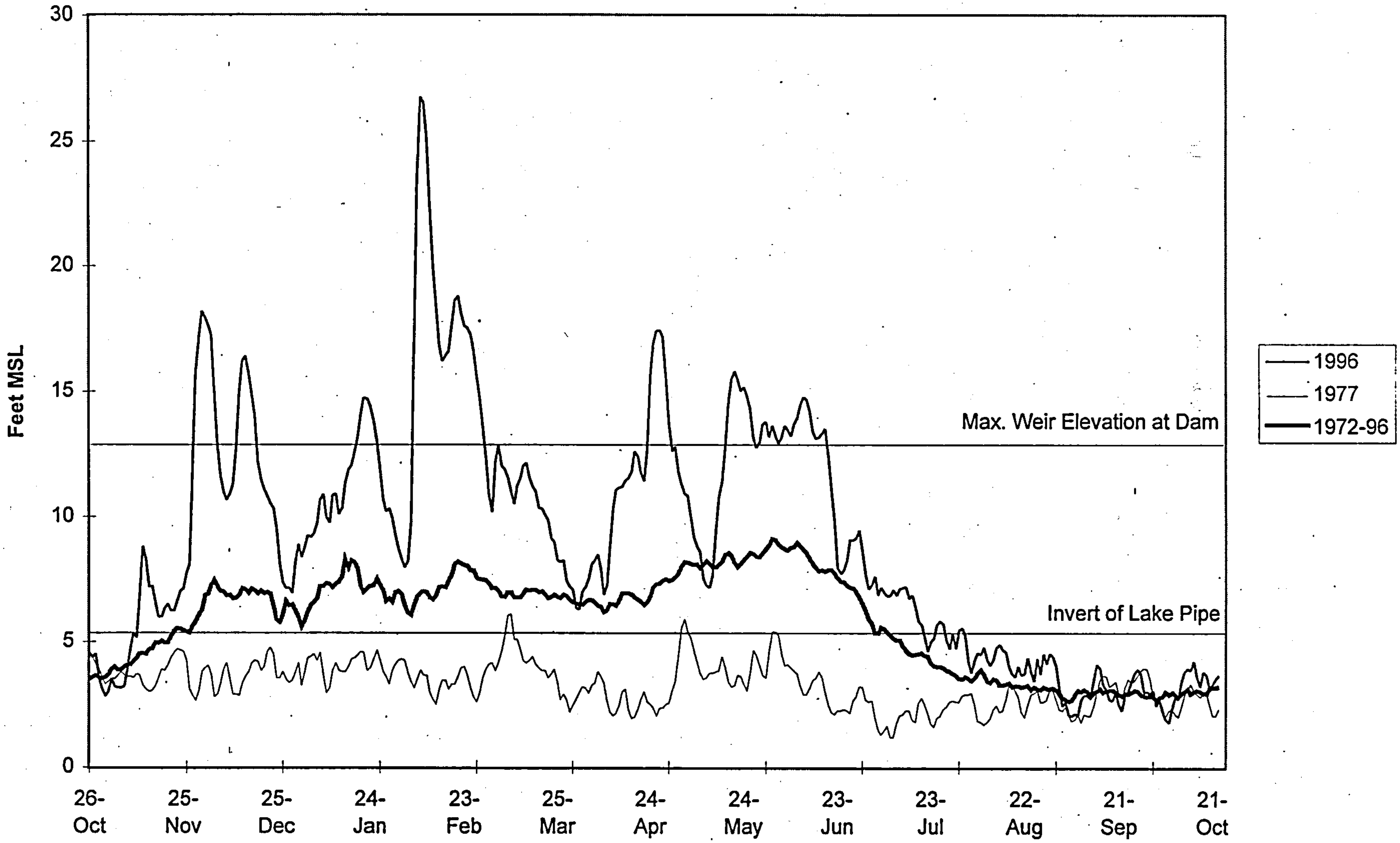
Drafted by Jennifer Brown; reviewed by Kevin Erwin, Mary Kentula, Beth Middleton, Eliska Rejmankova, and Curtis Tanner

Remember, send your edited copy to Jane Epperson; 2901 W. Truman Blvd, Jefferson City, MO 65109; fax 573 526-4495; email questions to epperj@conservation.state.mo.us.

High, Medium, Low Stages in Columbia River



Historical vegetation types documented at Smith and Bybee Lakes Wildlife Area
(from a variety of sources, generally dating to the 1850s)

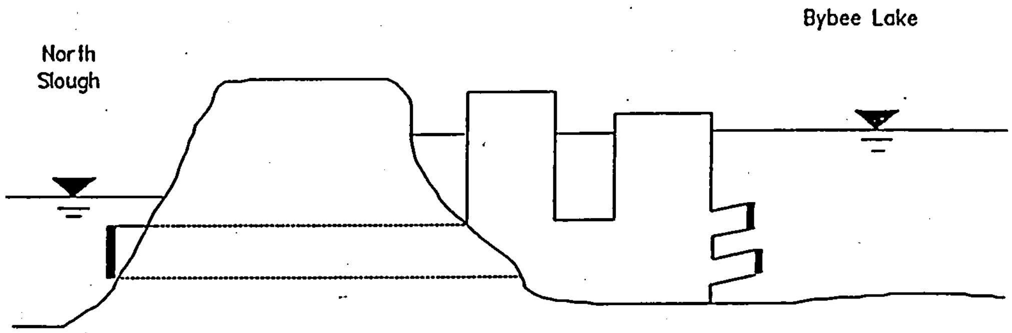
Habitat type	Examples or descriptions
Water	Rivers, sloughs, ponds, beaver ponds, lakes, marshy lakes, bayous
Riparian forest	Ash, red alder, bigleaf maple, black cottonwood, white oak, dogwood
Wetland prairie	Seasonally wet prairie
Prairie	Upland prairie
Shrubland	Willow swamp, can include ninebark, ash
Riparian forest	Ash-willow swamp, "very thick", may have ninebark, briars
Emergent wetlands	Marsh, includes "wet meadow"

Note: these are very general descriptions used in a variety of locations and by various sources. *Particular species (e.g., white oak) may not have been seen in the Smith and Bybee lakes area.* The descriptive information is included only to help visualize the habitat types that were documented.

Much additional work remains to be done, documenting the sources and compiling species lists. Thus this list should be regarded as preliminary.

Diagnostic and Feasibility Study - Metro, 1996.

Existing Flow Control Structure



Existing Flow Control Structure

The existing flow control structure housed within the dam separating the lakes from the Columbia Slough was built in 1992. The new structure utilized the existing earthen dam with a 60" diameter corrugated metal pipe 63 feet long through its base connecting Bybee Lake to the eastern end of the North Slough (Figure 17). The flow control structure was intended to provide more control over regulating the surface water levels in the lakes. Prior to this new structure, a weir fixed at 10.4 feet AMSL was in place on the Bybee Lake side of the pipe.

The new flow control structure attaches to the 60 inch diameter pipe on the Bybee Lake side of the dam. The structure houses a vertical overflow pipe, an adjustable high-flow weir and a low-flow control gate (Figure 18). The 4-foot wide adjustable weir, which has a minimum elevation at 8.4 ft. AMSL, receives water through a 36-inch diameter grated intake pipe with an invert elevation of 6.9 ft. AMSL. The low-flow control gate, a 30-inch diameter opening covered with a regulated circular plate, receives water through a 30-inch pipe with an invert elevation of 5.5 ft. AMSL. At lake surface elevations less than 5.5. ft. AMSL, no water from the lakes will flow through the structure.

Given the configuration of the new structure, water from the North Slough would enter the lakes through the structure when slough water surface elevations exceeded that of the lakes. Due to concern of entry of water of lower quality from the Columbia Slough via the North Slough into the lakes, an iron flap gate was mounted on the slough side of the 60-inch diameter pipe upon completion of the structure. This gate allows lake water to flow out and prevents slough water from entering the lakes through the structure.

OPTIMUM WATER LEVEL CONTROL OF SMITH/BYBEE LAKES - Page 1

Suggested by Smith/Bybee Technical Advisory Committee

______ Favorable ~~Drawdown~~ Inundation Period

~ ~ ~ ~ Favorable Drawdown Period

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Hydrology (no flow from slough)	RAINFALL						DRY PERIOD			RAINFALL		
Fish (target species is LG Bass)				[Critical Period[1]]				~ ~ ~ ~ ~ ~ ~ ~ ~ ~				
Mosquito Control (*Aedies* v.)	high water levels							~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~				
Shorebirds									~ ~ ~ ~ ~ ~ ~ ~[2]			
Waterfowl	breeding period[3]									~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
Avian Botulism	______					~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~[4]						______
Herptiles	(To be discussed.)											
Mammals	(To be discussed.)											

[1] 2 to 4 ft. of water over fairly firm substrate for spawning; any drawdown in this period may strand fry.

[2] Drawdown water level should be sufficient to create mudflats for migratory species.

[3] No significant or quick change in water levels during nesting period.

[4] Rapid drawdown and temperatures > 25°C create conditions favorable for bacterial growth (i.e. fish stranding).

Suggested by Smith/Bybee Technical Advisory Committee

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.

________ Favorable Inundation Period
~ ~ ~ ~ Favorable Drawdown Period

Vegetation - Control

Reed Canarygrass[1]

Purple Loosestrife

Smartweed (P. coccineum) — more information needed ~ ~ ~ ~ ~ ~ ~ ~ ~

Vegetation - Enhancement

Wapato

Pacific willow (S. lasiandra) — ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Ash (F. latifolia) — ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Sedges (edge emergents) — Water surface level determines distribution.

Water Quality

a) In minimizing increases in the rate of eutrophication, water surface level is less determinant than introduction of an external source of water lower in nutrients. Take advantage of freshets in Columbia and Willamette Rivers.

b) Drawdown effects detrimental to water quality can be minimized by lowering levels in fall when temperatures are lower and rainfall input is forthcoming (in normal years).

Recreation

Wildlife Observation — ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Boating

[1] Shade and depth of inundation is also a factor in control.

coordinated by:
METRO
Parks and Greenspaces
600 N.E. Grand Avenue
Portland, Oregon 97232

Technical Advisory Committee
for Smith and Bybee Lakes Wildlife Refuge

8:30 a.m. - 12:00 p.m., Monday, April 22
Metro Regional Center, Council Annex
600 N.E. Grand Avenue
Portland, Oregon

The purpose of this meeting is to develop a water management strategy for the lakes based on the management objectives agreed upon at the last TAC meeting (listed on reverse side of this page). Specifically, (1) parameters for designing an appropriate water control structure need to be established and (2) water management options discussed. This is one of the final steps toward fulfillment of the Rivergate Fill Agreement. Decisions on the design objectives from the TAC, with all the signatory agencies represented, will expedite the fulfillment of the mitigation agreement.

Within the next two weeks, you will receive a Draft Diagnostic/Feasibility Study for Smith and Bybee Lakes, which may assist you in determining the preferred water management option for the lakes area. Any comments you may have on the draft are welcomed.

* * * * *

Technical Advisory Committee Recommendations

In May and June, 1995, the Smith and Bybee Lakes Technical Advisory Committee (TAC) asked to review studies recently completed and, in context of other existing information, to make water management recommendations. Water management recommendations made by TAC are described below.

Objective

Manage the hydrology of Smith and Bybee Lakes in a manner that allows the water surface elevations in the lakes to mimic those of the Willamette and Columbia Rivers, both daily and seasonally.

Strategies

1. Replace the existing water control structure with one that will allow unobstructed flow both in and out of the lakes on a daily and seasonal basis.
2. Develop a water source and distribution system to augment flow into the lakes from an outside source as needed to control avian botulism, mimic river hydrology, and other management needs.
3. Remove the sunken barge obstructing flow in the North Slough while replacing equivalent habitat values the barge has afforded the North Slough.
4. Develop a water management plan that includes monitoring and assessment to ensure that management goals are being met.

Proposed Schedule

1. Complete construction and have operational the replacement water control structure no later than December, 1997.
2. Develop a water source and have operational a distribution system by the summer, 1998.
3. Remove barge before the replacement water control structure becomes operational.
4. Have fish habitat enhancements mitigating barge removal in place when the replacement water control structure becomes functional.
5. Develop water management plan prior to the construction of the replacement water control structure.

Water Management Objectives for Smith ands Bybee Lakes
as recommended by Smith and Bybee Lakes Technical Advisory Committee 6/28/95 and adopted by Smith and Bybee Lakes Management Committee 8/15/95

Objective

Manage the hydrology of Smith and Bybee Lakes in a manner that allows the water surface elevations in the lakes to mimic those of the Columbia River, both daily and seasonally (see attached figure).

Strategies

1. Replace the existing water control structure with one that will allow unobstructed flow both in and out of the lakes on a daily and seasonal basis.
2. Develop a water source and distribution system to augment flow into the lakes from an outside source as needed to control avian botulism, mimic river hydrology, and other management needs.
3. Remove the sunken barge obstructing flow in the North Slough while replacing equivalent habitat values the barge has afforded the North Slough.
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Proposed Schedule

1. Complete construction and have operational the replacement water control structure no later than December, 1997.
2. Develop a water source and have operational a distribution system by the summer, 1998.
3. Remove barge before the replacement water control structure becomes operational.
4. Have fish habitat enhancements mitigating barge removal in place when the replacement water control structure becomes functional.
5. Develop water management plan prior to the construction of the replacement water control structure.

Issues

Fish
- Enhance juvenile salmon movement both in and out of the lakes system (i.e. lakes open to river system via North Slough).

- Maintain, to the extent possible, warm-water fishery: provide stable water levels April-June; monitor fishery in lakes since it may either improve or degrade warm water fishery)

Mosquito Control
- Minimize reed canarygrass encroachment: it may be controlled by prolonged inundation at least once in every five years.

Shorebirds
- Return to variation mimicking river water levels.

Waterfowl
- Return to variation mimicking river water levels

Avian Botulism
- Have ability to control water level during the critical period (August - September) through water augmentation (i.e. pumping) or vigilant removal of infected birds

Herptefauna
- Return to variation mimicking river water levels

Macroinvertebrates
- Returning to river water level variation will enhance some species while reducing productivity in others.

Mammals
- Beaver control will be enhanced by return to river water level variation.
- Nutria may be favored under river hydrology.

Vegetation
- Willow community will be enhanced by return to river hydrology; control may be exercised with prolonged inundation for at least 2 years.
- Sagittaria has potential for increase in areal growth by returning to river hydrology.
- Emergent plants communities growing along lake perimeter will be enhanced by returning to river hydrology.
- Reed canarygrass encroachment is favored by returning to river hydrology; however, it can be controlled by prolonged flooding during the growing season for at least one year.
- Purple loosestrife spread will be enhanced by returning to river hydrology; it can be controlled through timely hand removal, release of predatory insects, and prolonged inundation for one year.
- Smartweed growth is disfavored by the return to river hydrology.

Submitted by Jim Morgan 9/8/95

600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232 2736
TEL 503 797 1700 | FAX 503 797 1797

METRO

Smith & Bybee Lakes Management Committee

*Revised Meeting Notes

Metro Regional Center
Room 270
Tuesday, June 25, 1996
5:30 PM

In Attendance:

Joe Pesek	Oregon Dept. of Fish & Wildlife
Joe Fitzgibbon	The Oregonian
Mary Abrams	City of Portland, Bureau of Env. Services
Jim Morgan	Metro, Regional Parks & Greenspaces
Tim VanWormer	Port of Portland
Pat Lee	Metro, Regional Parks & Greenspaces
Jeff Kee	Friends of Smith & Bybee Lakes
Eve Vogel	Portland Audubon Society
Troy Clark	Friends of Smith & Bybee Lakes
Neil Schulman	Metro, Regional Parks & Greenspaces
Patricia Sullivan	Metro, Regional Parks & Greenspaces

Metro Councilor Ed Washington made a brief appearance at the meeting. He expressed appreciation for the committee's efforts on behalf of the Smith & Bybee Lakes area.

Eve Vogel opened the meeting with a reminder that her term as chairperson of the Management Committee has come to an end. She asked that other committee members consider their interest in and availability to accept this position. She recommended that a vote be taken and the post filled at the next meeting.

Updates of Activities

Among activities briefly mentioned were the Northwest History Symposium, (by Jeff Kee) and the Columbia Slough Watershed Council meeting (by Troy Clark). Troy, who represents this committee's interests on the Watershed Council, offered to present any concerns or information members might wish to share with the Council. Troy reported that at the last Council session, Ed Squire gave an informative presentation on the Clean Water Act. Jeff requested that Troy provide announcements of upcoming Columbia Slough Watershed Council meetings and updates of relevant decisions and activities. Troy agreed to do so.

Troy also brought up the forthcoming 2nd Annual Columbia Slough Small Craft Regatta to be held on Sunday, July 28th. An "Unrace to Save the Slough" will be part of the festivities.

AGENDA:

Neil Schulman - Recommendations for Environmental Education and Interpretive Programs

Neil provided handouts of a draft of the Environmental Education and Interpretation Goals for Smith and Bybee Lakes. This included the following 1996-97 programs: Monitoring and Stewardship Programs, Field Trip Programs and Smith and Bybee Lakes Day. Neil hopes to organize a committee to re-examine Smith and Bybee Lakes Day for next spring. This group might include members of this committee as well as some teachers and other interested parties. Both Jeff and Troy expressed an interest in participating.

Further discussion revolved around an Adopt-A-Plot Program, teacher training and involvement in the North Portland and St. Johns communities. In addition, Neil described the direction being taken with the Interpretive Center. Now being considered is a small classroom with wet lab and a modest interpretive area. These would have to have the ability to be removed in case of flooding. Jim Morgan observed that there is an obtrusive 8 to 10 ft. triangle of sand at the water's edge which would be a good location for a buffer with the Interpretive Center. It is the area least prone to flooding.

Jeff would like to have a data base established which would incorporate (1) a Smith & Bybee Lakes calendar of events for participation by the general public, (2) information helpful to the Smith & Bybee Lakes Management Committee for funding and management rationale and (3) information on modeling projects, including PSU and OSU research projects. It was suggested that this idea be discussed at the next Management Sub-Committee meeting. Mary Abrams emphasized it must be understood that data collected during the monitoring projects will not be used for 'higher' purposes without quality assurance requirements being met. Other data can be useful, but it must be understood under what conditions it was collected.

Neil Schulman was commended for the fine job he has done in this area of environmental education and interpretation for Smith & Bybee Lakes. Jim Morgan thanked him for taking the initiative on a number of issues. Beginning July 1st, however, Neil's position becomes half-time. Pat Lee interjected that year-long continuity would be helpful. *There is flexibility to assign a 40 hour per week work shift during peak demand period (early fall/ spring) and reduce work shifts to less than 20 hours per week during slower demand period (winter and summer).*

Third Port Mitigation Action

Jim Morgan would like to present a firm recommendation to the signatory agencies of the Port mitigation agreement. He asked the committee to consider putting the "Cadillac" management option to the agencies as the third mitigation component. Jeff stated he was of the understanding that these were completely separate. Jim replied that was true they are independent, however, they are undeniably intertwined. He is apprehensive there will be a missed opportunity for the Port to fulfill its perceived obligations. The Port had given a figure of how much it wants to spend on the three projects. There are, therefore, limited funds and a limited time frame in which to work. Joe Pesek stated that the projects are already in excess of the amount of funds the Port committed to. He added that the Port is going to have to mitigate for losses on Hayden Island, however, and this might lead to another funding resource.

* Revised/ corrected meeting notes in *italics*.

Further discussion centered on whether there was a need to request a meeting of the mitigation agreement's signatory agencies. Jim felt there was no need for such a meeting in July. Jeff asked if it was possible for them to meet to evaluate the "minimum" and "Cadillac" options as a possible third mitigation action. Pat Lee offered that it may be a more effective use of their time if there was a firm recommendation for them to consider. He also said he sensed a reluctance on the part of some committee members to accept the "Cadillac" option as the third mitigation project and asked for other suggestions, other options to put on the table. Eve asked if Joe could compile a list of other possible alternatives. She also suggested a memo be put out to signators for their input. Joe pointed out that the mitigation agreement does not stipulate the project must be at Smith & Bybee Lakes. Troy was not in favor of any project that was outside the lakes area. Pat concurred that Metro staff would like the third mitigation to happen in support of Smith & Bybee Lakes.

No decision was reached.

Prioritization of Components of Management Committee Recommendation

Note: A Reminder of the six components of the recommended "Cadillac" option are listed below. The first four components comprise what was termed the "minimum" option.

1) to remove the current structure
2) to replace it with a structure that will allow unobstructed flow both on a seasonal and daily basis through the North Slough into the lakes
3) to retain the ability to pump
4) to retain the ability to raise the water level in the event of management needs, such as responding to an occurrence of avian botulism

5) To directly connect the western arm of Bybee Lake to the Columbia Slough with an adjustable wier and tide gate
6) To separate the western arm of Bybee lake from the rest of the lake with an adjustable weir.

Pat Lee reminded the committee that if any other type of control structures were going to be considered, this was the time to do so.

Discussion ensued on the order of the components. Eve suggested problems would arise if the dam was removed without providing for the ability to augment the water and that at least the first four components need to happen at the same time. Joe wanted to prioritize the six components. Mary supported packaging the first four components, giving none special priority. Jim maintained that a phased-in approach to the "Cadillac" plan for reaching the maximum practical option was best.

Vote

Mary Abrams made the following motion:

> **Accept Jim Morgan's phased-in approach to the "Cadillac" option as defined below:**

1st phase - Implement the minimum option (components one through four)

followed by monitoring to observe the effects.

2nd phase - Based on the monitoring, make a decision on whether to implement components five and six of the "Cadillac" option.

Jeff Kee seconded the motion. There was no further discussion.
The motion passed. The vote - four to one in favor. The votes were cast as follows:

In favor: Mary Abrams, Jeff Kee, Pat Lee and Tim VanWormer
Against: Joe Pesek
Abstention: None

Jim Morgan: Circumvential Trail Update

A complete trail cannot be constructed until the closure of the landfill is complete. A U of O landscape architect student is interning this summer at Metro Parks & Greenspaces. It is hoped he will be able to do some work on this trail project.

The next Management Sub-Committee meeting was set for Thursday, July 18th at 6:30 PM at the Lucky Lab on 9th & Hawthorne.

The next Smith & Bybee Lakes Management Committee meeting was set for Wednesday, July 31st at 5:30 PM at Metro. (Note: this is a departure from the usual fourth Tuesday of the month to accommodate schedule conflicts.) The agenda will include selecting a new chairperson, and the third Port mitigation project.

Meeting Notes submitted by Patricia Sullivan. Please call me at 797-1870 if you have any additions or corrections or bring them up at the next meeting.

Analysis of Management Alternatives for Improving Water Quality in North Slough Adjacent to the St. Johns Landfill (PSU - Wells, 1992)

3.1 EFFECT OF OPENING SMITH AND BYBEE LAKES TO NORTH SLOUGH

The effect of opening up North Slough to Smith and Bybee Lake by removing the dike at the end of North Slough is evaluated in this section for both summer (low-water) and late winter/early spring (high water) conditions.

3.1.1 Summer, Low-Water Conditions

Model comparisons were made between Runs 1 (Smith/Bybee lakes open to North Slough) and 3 (existing physical configuration) during the summer (low-water) period.

3.1.1.1 Effect on Flow Rates along North Slough. According to Table 15, flow rates into and out from North Slough were from 7 to 10 times higher with Smith and Bybee Lakes open to North Slough. Figures 6 and 7 show the time series of flow rates at the entrance to North Slough and at the mid-point along North Slough (between ENS and WNS), respectively, during the simulation period. The increased circulation in North Slough affected water quality parameters significantly.

3.1.1.2 Effect on Water Quality Parameters. Tables 7 through 10 give an overview of water quality changes between Runs 1 and 3 averaged over the vertical and temporally over the simulation period at four locations. The most significant changes occurred within North Slough.

Tracer Concentration

Figure 8 shows a comparison between Run 1 and Run 3a of the time series of a conservative tracer released at a concentration of 100 mg/l and a flow rate of 1 cfs continually over the simulation at ENS. With this hypothetical release, the effect of this management scenario on mixing of landfill leachate can be estimated. At ENS, the concentration of tracer was reduced by a factor of about 5 by opening up the lakes.

Dissolved Oxygen

Figure 9 shows a comparison between Run 1 and Run 3a of the time series of dissolved oxygen concentrations at ENS. The high sediment oxygen demand in North Slough is primarily responsible for lowering dissolved oxygen concentrations. With increased flow into North Slough with the dike removed, dissolved oxygen concentrations are almost at saturation with an average of 7.1 mg/l, whereas for the existing situation, dissolved oxygen values averaged 4.8 mg/l.

Coliform Bacteria

Figure 10 shows a comparison between Run 1 and Run 3a of the time series of coliform bacteria at ENS. Coliform bacteria are from CSO and storm water discharges into the Columbia Slough. The Willamette River boundary condition was 80 colonies/100 ml. For the Lakes open to North Slough, coliform bacteria from the Willamette and from CSOs move to the end of North Slough. For the existing situation, so little flow moves up North

Table 15. Variation of rms (root-mean-squared) flow rate (m^3/s) for the entire summer simulation period for Runs 1-4 and 9 at several control points.

Location	**Run 1 - Lakes open, existing bathy-metry**	**Run 2 - Lakes open, dredged**	**Run 3 - existing, existing bathy-metry**	**Run 4 - existing, dredged**	**Run 9 - existing, existing bathy-metry (detailed barge constr-iction)**
Lombard St. Bridge	17.8	18.6	14.1	14.1	13.8
Entrance to North Slough	7.2	8.2	0.94	0.96	0.94
Flow at end of North Slough (ENS)	7.1	8.0	0.3 (inflow from Bybee Lake)	0.3 (inflow from Bybee Lake)	0.3 (inflow from Bybee Lake)
Flow at mid-point of North Slough between ENS and WNS	7.5	8.4	0.7	0.7	0.7

Slough in the summer that almost no bacteria from the Willamette River and CSOs in the Columbia Slough move to ENS.

3.1.2 Late Winter/Early Spring (High-Water) Conditions

Model comparisons were made between Runs 5 (Smith/Bybee Lakes open to North Slough) and 7 (existing physical configuration) during the late winter/early spring, high-water period.

3.1.2.1 Effect on Flow Rates along North Slough. According to Table 16, not only did the flow rate at the entrance to North Slough increase by a factor of 40 with the Lakes open to North Slough, but the flow at Lombard Street also increased by about 50% because of the increased tidal prism available in Smith/Bybee Lakes at high water. Note that according to Table 16, the flow at the end of North Slough for Run 7 was 0 m^3/s. This meant that no flow was coming in from Bybee Lake during that period. Illustrating the significant effect of the Lakes on the circulation in North Slough, Figure 11 shows the flow rate into and out from North Slough comparing Run 5 and Run 7.

3.1.2.2 Effect on Water Quality Parameters. Tables 11 through 14 give an overview of water quality changes between Runs 5 and 7 averaged over the vertical and temporally over the simulation period at four locations. The most significant changes occurred within North Slough, but changes in water quality were evident in the Columbia Slough at the mouth of North Slough also (at station CNN in Table 11).

Tracer Concentration
Figure 12 shows a comparison between Run 5 and Run 7 of the time series of a conservative tracer released at a concentration of 100 mg/l and a flow rate of 1 cfs continually over the simulation at ENS. At ENS, the concentration of tracer was reduced significantly (factor of almost 70) by opening up the Lakes. The tracer concentration at ENS was very high because there was no Bybee Lake water mixing with the tracer. At the mid-point of North Slough, the effect of the Lakes being open on the dilution of the tracer was less - a factor of 35 compared with the existing situation. Figure 13 shows the effect of the Lakes being open on reducing tracer concentrations at CNN (an average reduction of a factor of 2.

Dissolved Oxygen
Figure 14 shows a comparison between Run 5 and 7 of the time series of dissolved oxygen concentrations at ENS. With increased flow into North Slough with the dike removed, dissolved oxygen concentrations were increased by an average of almost 3 mg/l (from 7.5 to 10.1 mg/l). The very low dissolved oxygen shown in Figure 13 around Julian day 90 for the existing physical configuration occurs because of decreased flow into and out from North Slough based on the tidal conditions. The periodic "dips" in dissolved oxygen for the existing situation are a result of limited exchange between North Slough and Columbia Slough based on tidal conditions.

Table 16. Variation of rms (root-mean-squared) flow rate (m^3/s) for the entire late winter/early spring simulation period for Runs 5-8 at several control points.

Location	Run 5 - Lakes open, existing bathy-metry	Run 6 - Lakes open, dredged	Run 7 - existing, existing bathy-metry	Run 8 - existing, dredged
Lombard St. Bridge	27.4	29.1	16.0	16.1
Entrance to North Slough	19.9	21.5	0.54	0.54
Flow at end of North Slough (ENS)	20.0	21.5	0.0 (inflow from Bybee Lake)	0.0 (inflow from Bybee Lake)
Flow at mid-point of North Slough between ENS and WNS	20.3	21.8	0.33	0.33

DEQ - 303(d)

The following records match your search criteria for waterbodies in all Sub Basins of the **Willamette** Basin. Select a **Record ID** to view details of the waterbody:

Record ID	Waterbody Name	Boundaries	Parameter	Change from 1996
6550	Blue Lake	Lake	pH	No Change
6266	Blue Lake	Lake	Aquatic Weeds or Algae	No Change
6834	Bybee Lake	Lake	Habitat Modification	No Change
6551	Bybee Lake	Lake	pH	No Change
6382	Bybee Lake	Lake	Flow Modification	No Change
6267	Bybee Lake	Lake	Aquatic Weeds or Algae	No Change
6137	Bybee Lake	Lake	Biological Criteria	No Change
6773	Cottage Grove Reservoir	Reservoir	Toxics	No Change
6774	Dorena Reservoir	Reservoir	Toxics	Addition
6476	Fairview Lake	Lake	Nutrients	No Change
7058	Fern Ridge Reservoir	Reservoir	Turbidity	No Change
6056	Fern Ridge Reservoir	Reservoir	Bacteria	No Change
6835	Smith Lake	Lake	Habitat Modification	No Change
6553	Smith Lake	Lake	pH	No Change
6383	Smith Lake	Lake	Flow Modification	No Change
6269	Smith Lake	Lake	Aquatic Weeds or Algae	No Change
6138	Smith Lake	Lake	Biological Criteria	No Change

There are 17 records in the table.

Return to Search Choices Page

* All but pH are directly linked to dam placement & impoundment.

Preliminary dike stabilization study, St. Johns Landfill (Cornforth Consultants, 6/99)

4.4. Priority Areas – Dam Removed

As discussed in Chapter 3, removing the dam would probably cause an increase in the rate of scour along the North Slough shoreline due to an increase in flow velocity. On this basis, it would be necessary to treat the entire length of landfill dike through the North Slough to prevent scour-related slope failures (approximately 4,600 feet of shoreline). A conceptual treatment method for repairing the dike and protecting it from additional scour is presented in Chapter 5.

The increased rate of scour would likely affect the natural dike along the northern shoreline of the North Slough also. This scour would gradually remove vegetation and habitat from a small portion of the Smith and Bybee Lakes wildlife management area. If this loss was considered unacceptable, it would become necessary to treat the northern shoreline to prevent scour there also (approximately 4,600 feet). If needed, the conceptual treatment method discussed in Chapter 5 could be applied to the northern shoreline of the North Slough also.

Aside from the North Slough area, the other priority treatment areas would remain the same as the existing condition where the dam remains in-place. We recommend that Sections 3 and 5 be stabilized for the same reasons discussed above, and the medium priority areas be watched closely.

Flow Velocity Reduction Alternatives. As an alternative to treating the entire North Slough shoreline to prevent scour, the scour potential could be minimized by implementing other methods to offset the increase in flow velocity caused by the dam removal. Some alternatives include: dredging or widening the channel; installing wing wall structures into the channel; constructing weirs across the slough; creating new breaches between the North Slough and adjacent lakes; or replacing the existing dam with a new structure capable of regulating flows during seasonal flood periods. An evaluation of flow velocity reduction methods is beyond the scope of this study. However, as requested by Metro, our design team is preparing a separate proposal to provide this service.

Smith & Bybee Lakes Environmental Studies
(Fishman 1987) - Appendix G

TABLE G-4
FISH BIOMASS IN SMITH AND BYBEE LAKES STUDY AREA
DURING 1986

SPECIES	BYBEE LAKE	SMITH LAKE	SMITH CHANNEL	DAM POOL	COLUMBIA SLOUGH
	--------PERCENT WITHIN SAMPLING AREA--------				
30APR-9MAY					
	n=58	n=65	n=41	n=45	n=143
No. of stations	7	6	3	1	8
Bl.Crappie	0	1	0	0	0
Bluegill	<1	<1	1	0	<1
Br. Bullhead	1	0	0	0	0
Chinook Salmon	<1	<1	<1	1	1
Cottid (sculpin)	0	0	0	0	<1
Carp	92	93	81	80	64
Goldfish	0	<1	2	0	2
LM Bass	<1	0	12	6	0
Ls sucker	<1	<1	0	11	29
Peamouth	0	<1	0	3	3
Pumpkinseed	<1	<1	0	0	0
Squawfish	<1	<1	0	<1	<1
W. crappie	3	1	3	0	2
Warmouth	0	0	0	0	0
Yellow perch	2	2	1	<1	1
26JUN					
	n=18	n=21	n=26	n=36	n=49
No. of stations	4	3	2	1	4
Bl. crappie	0	1	<1	0	0
Bluegill	<1	0	2	1	<1
Br. bullhead	0	3	0	0	<1
Chinook salmon	0	0	0	0	0
Cottid (sculpin)	0	0	0	0	0
Carp	92	88	86	93	81
Goldfish	0	0	0	0	3
LM bass	4	3	11	5	0
Ls sucker	0	0	0	0	13
Peamouth	0	3	0	<1	0
Pumpkinseed	0	0	0	0	0
Squawfish	0	0	0	<1	<1
W. crappie	2	2	<1	<1	2
Warmouth	0	0	0	0	<1
Yellow perch	2	0	0	<1	<1

TABLE G-4 (continued)

SPECIES	BYBEE LAKE	SMITH LAKE	SMITH CHANNEL	DAM POOL	COLUMBIA SLOUGH
	--------PERCENT WITHIN SAMPLING AREA--------				
24-25OCT					
	n=93	n=17	n=6	n=21	n=45
No. of stations	4	3	2	1	5
Bl. crappie	0	3	<1	0	0
Bluegill	5	2	0	2	<1
Br. bullhead	0	0	0	0	0
Chinook salmon	0	0	0	0	0
Cottid (sculpin)	0	0	<1	0	<1
Carp	82	76	97	95	42
Goldfish	0	8	0	0	25
LM bass	8	1	3	0	2
Ls sucker	0	8	0	0	26
Peamouth	0	2	0	0	0
Pumpkinseed	1	0	0	0	1
Sunfish, unid.	0	0	0	<1	0
Star. flounder	0	0	0	0	<1
Squawfish	0	0	0	0	3
W. crappie	3	0	0	0	<1
Warmouth	0	0	0	0	0
Yellow perch	1	1	0	2	<1

Electrofishing survey of Smith and Bybee Lakes. U.S. Fish & Wildlife Service. (1992)

Table 4. Biomass of fish (percentage) in the Smith and Bybee Lakes system, June 29 - July 2, 1992.

# of sites	3	3	2	1	4
# of fish	26	55	151	78	42
Species	Bybee Lake	Smith Lake	Smith Channel	Dam Pool	Columbia Slough
Carp	88	70	92	89	98
Northern Squawfish	-	-	<1	-	<1
Peamouth	-	-	<1	-	-
Yellow Bullhead	-	1	-	1	<1
Brown Bullhead	1	3	-	-	<1
Mosquitofish	-	-	<1	<1	-
Largemouth Bass	1	6	2	4	1
Black Crappie	<1	4	-	-	<1
White Crappie	8	7	1	<1	-
Warmouth	-	-	<1	<1	-
Bluegill	<1	5	4	5	<1
Pumpkinseed	-	<1	<1	-	<1
Yellow Perch	<1	4	<1	<1	<1
Sculpin	-	-	-	-	<1

from Kim Daily, ODFW
8/92

ACTIVITY PERIODICITY TABLE FOR WARMWATER GAME FISH SPECIES IN SMITH AND BYBEE LAKES

GROUPING OF SPECIES PRESENT:

- LARGEMOUTH BASS (LB)
- BULLHEADS (B)
  - YELLOW
  - BROWN
- CRAPPIES (C)
  - WHITE
  - BLACK
- SUNFISHES (S)
  - BLUEGILL
  - PUMPKINSEED
  - WARMOUTH
- YELLOW PERCH (YP)

ACTIVITY	SPECIES	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
SPAWNING													
	LB				<---	------	------	--->					
	B				<---	------	------	------	--->				
	C			<---	------	------	--->						
	S					<---	------	------	--->				
	YP			<---	------	--->							
NESTS AND FRY SUSCEPTIBLE TO DEWATERING													
	LB				<---	------	------	--->					
	B				<---	------	------	------	------	--->			
	C			<---	------	------	--->						
	S					<---	------	------	------	--->			
	YP			<---	------	------	--->						
ACTIVE FEEDING AND GROWTH													
	ALL			<---	------	------	------	------	------	------	--->		
MOVE TO DEEPER COOL WATER													
	ALL						<---	------	------	--->			
MOVE TO DEEPER WARMER WATER													
	ALL	<---	------	--->							<---	------	--->

Status and Biology of Black Crappie and White Crappie in the Lower Willamette River near Portland, Oregon. ODFW, 1991.

Some individuals were quite mobile. We recaptured 5 of 213 tagged black crappie, and recreational anglers returned an additional three tags. All three black crappie caught by anglers had moved at least 2 miles; one had moved approximately 7 miles in the year between original tagging and recapture. None of the black crappie we recaptured appeared to have moved; however, four of these five fish were recaptured within 9 days of being tagged.

We recaptured 5 of 99 tagged white crappie, and recreational anglers returned an additional four tags. One of the white crappie caught by anglers had moved more than 31 miles into the Columbia River in 5 months; another had moved 13 miles in 8 days. Two other white crappie caught by anglers appeared not to have moved. One of the white crappie we recaptured had moved 5 miles in 6 days. The other four had not moved; however, they were all recaptured within 9 days of being tagged.

Food Habits

The stomach of one large (>200 mm) black crappie examined during 1989 contained a subyearling chinook salmon *Oncorhynchus tshawytscha*. Because of this we examined the stomachs of 12 black crappie (149-240 mm) and 22 white crappie (206-240 mm) in 1990. Only one black crappie stomach contained food (a threespine stickleback *Gasterosteus aculeatus*); none contained juvenile salmonids. Nine white crappie stomachs contained food; most of these contained unidentified crustaceans. However, one white crappie (228 mm) had ingested a subyearling chinook salmon approximately 100 mm fork length. Although sample sizes were extremely low, we found evidence of potential predation by crappie on small juvenile salmonids. Grenfell (1962) noted that three black crappie collected in the lower Willamette River each contained a juvenile salmonid. However, these fish were collected in a trap net, and results may have been affected by feeding within the net.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE. 11th Avenue
Portland, Oregon 97232-4181

IN REPLY REFER TO:

ARW/MBHP

November 13, 1996

Ms. Emily Roth
Metro Regional Parks and Greenspace
600 NE Grand Avenue
Portland, Oregon 97232

Dear Ms. Roth,

The Fish and Wildlife Service is in support of the Smith-Bybee Lakes restoration. There is a history of avian botulism at this location, however this die-off was relatively minor. Reports of avian cholera are rare in the Pacific Northwest, however die-offs of more than 30,000 birds are periodically encountered in California and Nevada.

If resource agencies were to change long-term management strategies to eliminate the potential for avian cholera, the resulting loss of habitat would be far more detrimental to avian populations than this disease. Botulism is a density dependent disease, and the habitat provided by your project would serve to better distribute birds in the Lower Columbia River area, thus reducing potential for avian loss to botulism.

Sincerely,

Carey S. Smith

Carey S. Smith
Acting Chief, Migratory Birds
and Habitat Programs