DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No.	09-105137-WG
Project Name/Address:	Sherwood Dock Replacement and Path Construction 3270 West Lake Sammamish Parkway SE
Planner:	David Pyle
Phone Number:	425-452-2973
Minimum Comment Period:	**April 13, 2009**

Materials included in this Notice:

- ☒ Blue Bulletin
- ☒ Checklist
- ☒ Vicinity Map
- ☒ Plans
- ☐ Other:

Environme

City of Bellevue
Environmental Coordinator

1 BAC

City of Bellevue File Number 09-105137-WG
03/12/2009
Sherwood Dock Replacement and Path Construction
Project SEPA Checklist
3270 West Lake Sammamish Parkway SE

SEPA Checklist Reviewed By:
David Pyle, Land Use Planner
425-452-2973 - dpyle@bellevuewa.gov

PROPERTY OWNER'S NAME: Cole A. Sherwood

PROPONENT'S NAME: Gregory W. Ashley - Ashley Shoreline Design & Permitting

CONTACT PERSON'S NAME: Gregory W. Ashley
(If different from the owner. All questions and correspondence will be directed to the individual listed.)

CONTACT PERSONS'S ADDRESS: 16412 NE 10th Pl.
Bellevue, WA 98008-3707

CONTACT PERSON'S PHONE: (425) 957-9381

PROPOSAL TITLE: Sherwood pier repair & reconfiguration

PROPOSAL LOCATION:
(Street address and nearest cross street or intersection) Provide a legal description if available.
3270 W Lk. Samm. Pkwy. SE

PLEASE ATTACH AN 8½" x 11" VICINITY MAP WHICH ACCURATELY LOCATES THE PROPOSAL SITE SO THAT IT CAN EASILY BE IDENTIFIED IN THE FIELD.

GIVE AN ACCURATE, BRIEF DESCRIPTION OF THE PROPOSAL'S SCOPE AND NATURE:

A. GENERAL DESCRIPTION: Widen headwalk from 4' to 6' to allow wheel chair access. Replace storm destroyed platform and increase in size for wheel chair access. Install lower platform for wheel chair access to a boat. Relocate wxisting boatlift.

B. ACREAGE OF SITE: 13,750 SF

C. NUMBER OF DWELLING UNITS/BUILDINGS TO BE DEMOLISHED: Does not apply

D. NUMBER OF DWELLING UNITS/BUILDINGS TO BE CONSTRUCTED: Does not apply

E. SQUARE FOOTAGE OF BUILDINGS TO BE DEMOLISHED: Does not apply

F. SQUARE FOOTAGE OF BUILDINGS TO BE CONSTRUCTED: Does not apply

This is an application for Shoreline Substantial Development Permit and Critical Areas Land Use Permit to authorize the replacement of the existing dock with a wheel chair accessible dock and the construction of a new pathway connecting the dock to the existing residence.

G. QUANTITY OF EARTH MOVEMENT (IN CUBIC YARDS): Does not apply

Cut and fill will be limited to the installtion of restoration plantings. Estimated to be less than 1 CY.

H. PROPOSED LAND USE: Private single-family residence

I. DESIGN FEATURES, INCLUDING BUILDING HEIGHT, NUMBER OF STORIES & PROPOSED EXTERIOR MATERIALS: Does not apply

J. OTHER: Does not apply

RECEIVED
FEB 13 2009
PERMIT PROCESSING
Reviewed By:

ESTIMATED DATE OF COMPLETION OF THE PROPOSAL OR TIMING OF PHASING:

Construction to be carried out during the timing window of July 16 through Dec. 31

Possibly Fall 2009 after plants are dormant.

Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No

List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

A Biological Evaluation and planting plan to be prepared by EcoPacific Environmental Services

Shoreline restoration plan has been provided. See file.

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. List dates applied for and file numbers, if known.

No

List any government approvals or permits that will be needed for your proposal, if known. If permits have been applied for, list application date and file numbers, if known.

Shoreline Permit
HPA
Building Permit
Corps of Engineers Authorization

Shoreline Substantial Development Permit and Critical Areas Land Use Permit are required.

PLEASE PROVIDE ONE OR MORE OF THE FOLLOWING EXHIBITS, IF APPLICABLE TO YOUR PROPOSAL (PLEASE CHECK APPROPRIATE BOX(ES) FOR EXHIBITS SUBMITTED WITH YOUR PROPOSAL):

[ ] LAND USE RECLASSIFICATION (REZONE) Map of existing & proposed zoning.

[ ] PRELIMINARY PLAT (AND/OR P.R.U.D. OR P.U.D.) Preliminary plat map.

[ ] CLEARING & GRADING PERMIT
Plan of existing & proposed grading.
Development plans.

[✓] BUILDING PERMIT (OR DESIGN REVIEW)
Site plan.
Clearing & grading plan

[✓] SHORELINE MANAGEMENT PERMIT
Site plan.

Reviewed By: DP

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____.

b. What is the steepest slope on the site (approximate percent slope)?

< 1%

The property does not contain areas that are classified as steep slope critical areas.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Sand and gravel

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Does not apply

Cut and fill will be limited to the installtion of restoration plantings. Estimated to be less than 1 CY.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

No

Yes, erosion could occur during construction. Erosion control BMP's must be applied during construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

None, does not apply

No expansion of impervious surface is proposed or allowed as part of this project.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

None, does not apply

Erosion control BMP's must be applied during construction.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

None, does not apply

Vehicle and small equipment emissions are controlled by the State.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

None, does not apply

Reviewed By: DP

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes, Lake Sammamish

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, repair and reconfigure existing fixed pile pier

Application includes the construction of a replacement pier and connection path. See attached site plans.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None, does nopt apply

No fill is allowed and no fill is proposed.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Yes

Yes, the subject site is not within a FEMA regulatory floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No, does not apply

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No, does not apply

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . .; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None, does not apply

Reviewed By: _____

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

None, does not apply

2) Could waste materials enter ground or surface waters? If so, generally describe.

No, does not apply

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

None

No storm drainage systems will be constructed in association with this permit.

4. Plants

a. Check or circle types of vegetation found on the site:
__ deciduous tree: alder, maple, aspen, other
__ evergreen tree: fir, cedar, pine, other
__ shrubs
✓ grass
__ pasture
__ crop or grain
__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
__ water plants: water lily, eelgrass, milfoil, other
__ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

None

c. List threatened or endangered species known to be on or near the site.

Salmon

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native vegetation to be planted along the shore. Scope of planting to be determined by EcoPacific Environmental Services

Shoreline restoration plan has been provided. See file.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other: .....
mammals: deer, bear, elk, beaver, other: .....
fish: bass, salmon, trout, herring, shellfish, other: .....

b. List any threatened or endangered species known to be on or near the site.

Salmon

Reviewed By: D.P.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

c. Is the site part of a migration route? If so, explain.

Possibly a Salmon outmigration rout

d. Proposed measures to preserve or enhance wildlife, if any:

Adhere to all regulations and guidelines

See item 4.d above.

6. **Energy and Natural Resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

None, does not apply

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No, does not apply

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

None, does not apply

7. **Environmental Health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

No, does not apply

1) Describe special emergency services that might be required.

None, does not apply

2) Proposed measures to reduce or control environmental health hazards, if any:

None

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None, does not apply

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Construction, Monday through Friday, 8:00 A.M. to 4:30 P.M.

Reviewed By: _____

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

3) Proposed measures to reduce or control noise impacts, if any:

Limit time of construction to M-F, 8:00 A.M to 4:30 P.M.

Noise is regulated by City of Bellevue Code Section 9.18.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

Private single-family residence

No change in land use is proposed.

b. Has the site been used for agriculture? If so, describe.

No

c. Describe any structures on the site.

Existing storm damaged pier

d. Will any structures be demolished? If so, what?

No

e. What is the current zoning classification of the site?

R-5

f. What is the current comprehensive plan designation of the site?

Single-Family Medium Density (SF-M)

g. If applicable, what is the current shoreline master program designation of the site?

Shoreline Overlay Disctrict.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

Yes, shoreline

Yes, Lake Sammamish Shoreline Critical Area and Vasa Creek Type F Stream Critical Area.

i. Approximately how many people would reside or work in the completed project?

None, does not apply

j. Approximately how many people would the completed project displace?

None, does not apply

k. Proposed measures to avoid or reduce displacement impacts, if any:

None, does not apply

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Adhere to all regualtions and guidelines

Reviewed By: DP

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None, does nopt apply

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None, does not apply

c. Proposed measures to reduce or control housing impacts, if any:

None

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Does not apply

b. What views in the immediate vicinity would be altered or obstructed?

None, does not apply

c. Proposed measures to reduce or control aesthetic impacts, if any:

Noane, does not apply

11. **Light and Glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None, does not apply

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No, does not apply

c. What existing off-site sources of light or glare may affect your proposal?

None, does not apply

d. Proposed measures to reduce or control light and glare impacts, if any:

None, does not apply

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

Water sports

b. Would the proposed project displace any existing recreational uses? If so, describe.

No

Reviewed By: D.R

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None

13. **Historic and Cultural Preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None present

c. Proposed measures to reduce or control impacts, if any:

None

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

Does not apaply

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Does not apply

c. How many parking spaces would the completed project have? How many would the project eliminate?

None, does not apply

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private). No, does not apply

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No, does not apply

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

None, does not apply

Reviewed By: TDP

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

g. Proposed measures to reduce or control transportation impacts, if any:

None, does not apply

15. **Public Services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No, does not apply

b. Proposed measures to reduce or control direct impacts on public services, if any.

None, does not apply

16. **Utilities**

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

Does not apply

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

None proposed, does not apply

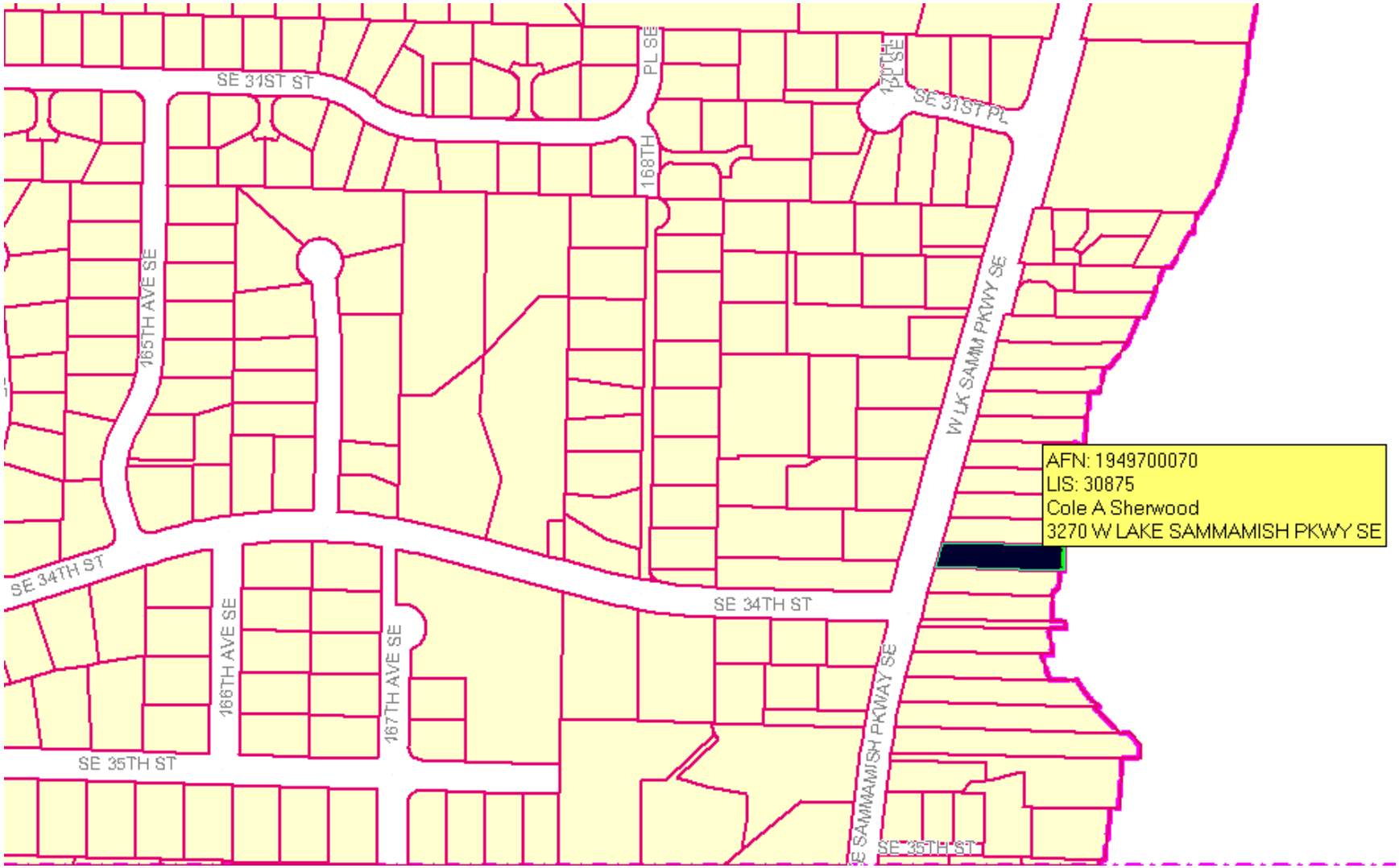
C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: **2/13/2009**

Reviewed By: _____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LIS: 30875
Cole A Sherwood
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167TH AVE SE
SE 35TH ST
SE 35TH ST

ENDANGERED SPECIES ACT - SECTION 7 CONSULTATION

BIOLOGICAL EVALUATION
(INFORMAL CONSULTATION FORMAT)

PIER REPLACEMENT
SHERWOOD PROPERTY

LAKE SAMMAMISH, WA

APPLICANT / PROPERTY OWNER:

Mr. Cole Sherwood
3270 West Lake Sammamish Parkway SE
Bellevue, WA 98008

PREPARED FOR:

U.S. Army Corps of Engineers,
Seattle District
Regulatory Branch
4735 E. Marginal Way South
Seattle, WA 98134-2385

PREPARED BY:

EcoPacific Environmental Services
2001 183 Ave. NE
Redmond, WA 98052

April 30, 2008

BIOLOGICAL EVALUATION
(INFORMAL CONSULTATION FORMAT)

PIER REPLACEMENT
SHERWOOD PROPERTY

TABLE OF CONTENTS

List of Figures

List of Tables

BIOLOGICAL EVALUATION - SHERWOOD PROPERTY

I. PROPOSED ACTIVITY

The proposed activity is to remove an existing pier and construct a larger pier. An existing freestanding boatlift and personal watercraft lift would be relocated.

II. DRAWINGS

Standard site drawings are provided in Attachment 1.

III. DATE

April 30, 2008

IV. APPLICANT

Mr. Cole Sherwood
3270 West Lake Sammamish Parkway
Bellevue, WA 98008

V. AGENT

Mr. Greg Ashley
Ashley Shoreline Design & Permitting
16412 NE 10th Place
Bellevue, WA 98008-3707

VI. PROJECT NAME

Sherwood Pier Replacement

VII. LOCATION(S) OF ACTIVITY

Section: SW 12 **Township:** 24 **Range:** 5

Latitude: 47°37' 47" North **Longitude:** 122° 05' 14" West

Waterbody: Lake Sammamish **County:** King

VIII. DESCRIPTION OF WORK

The project site is located on the west side of Lake Sammamish (Figure 1). The address is 3270 West Lake Sammamish Parkway Bellevue, WA 98008. The applicant is seeking authorization to install a replacement recreational pier at the subject property, a 50-foot waterfront lot with a sand beach. The new pier would replace the existing structure which is too small for proper moorage of the applicant's boats and personal watercraft. The existing pier is also inadequate for wheelchair access, a necessity at the site because the applicant has a disability that impairs walking.

The existing structure extends out a distance of about 107 feet and is comprised of a 95 x 4-foot mainwalk with a terminal ell platform and two fingers (see Attachment 1). Recent storms have destroyed some of the decking in the outer sections of the pier. Estimated total overwater area of the existing / old pier is 635 square feet. It is supported by approximately 45 wooden plies (non-creosote) ranging from 4 to 12 inches in diameter. There are no isolated mooring piles and the pier does not have side skirting. Metal remnants of an old boat launch railing system are evident on the bottom south of the existing pier.

The replacement pier would extend out a distance of approximately 105 feet (see Figure 3). The mainwalk would be 81 x 6 feet and the end platform 21 x 24 feet. A small lower platform (6' x 10') and wheel chair ramp (6' x12') would facilitate access to the boatlift. Total surface area of the new pier would be approximately 1,100 square feet; about 1,040 square feet would extend lakeward of the Corps OHWM (27 ft elevation, 1929 NGVD Datum). The pier would extend to a maximum depth of about 8 feet below OHWM.

Twelve 4-inch diameter steel piles would be installed to support the pier (Attachment 1). No piles would be used for about the first 22 feet of the mainwalk to protect the littoral fringe zone. Piling caps and stringers would be constructed of Douglas fir wood treated with ammoniacal copper zinc arsenate (ACZA). Treatment grade would be 0.4 (for stringers) and 0.6 (for caps) pounds per cubic foot ACZA retention. All wood treatment would be in compliance with Western Wood Preservers Institute (WWPI) standards for above-water application (WWPI 2006, WWPI 2001).

New pier decking would be composed of an open grating material (ThruFlow® brand). The bottom of the pier deck would be at least 1.5 feet above OHW.

The net result of the project would be a decrease in total number of piles by about 33. Total overwater surface area of the pier after construction would increase by about 465 square feet, but much of this increase would be in deeper water and the new deck surface material would permit higher light passage than the existing condition.

The new pier would be limited primarily to day use. No outdoor lighting poles would be included that could illuminate the littoral zone at night or provide hunting perches for piscivorous birds such as cormorants.

The applicant also plans to implement shoreline improvements to enhance local fish and wildlife habitat values (see Appendix A). These improvements include planting of native shoreline vegetation (> 800 square feet) along much of the length of the property.

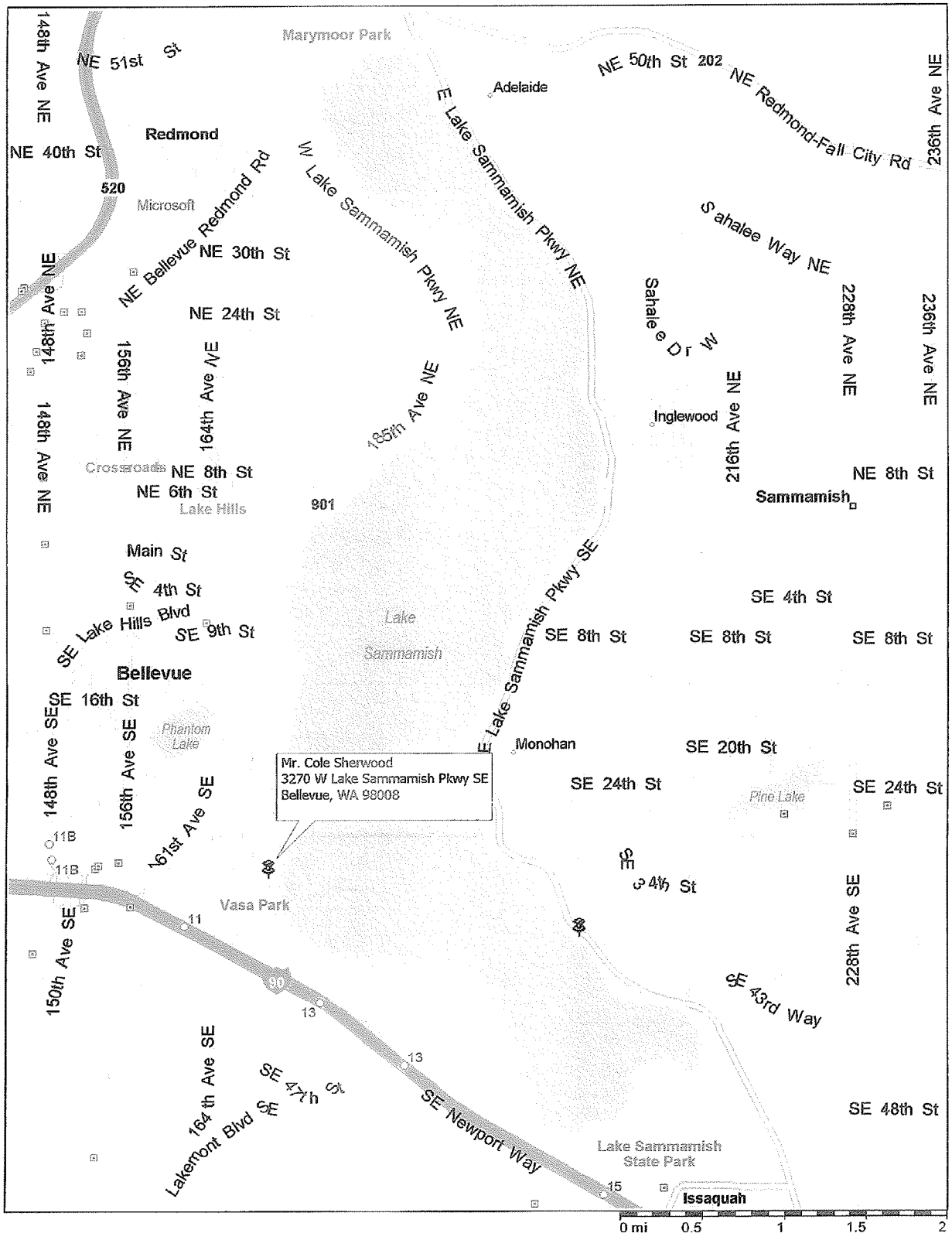

Figure 1. Map of Project Vicinity – Sherwood Property

IX. CONSTRUCTION TECHNIQUES

A. Construction sequencing and timing of each stage (duration and dates).

Pier installation would be conducted during the period of July 16 to December 31. This is the standard timing window for in-water construction for protection of federal listed fish species in that section of Lake Sammamish (USACE et al. 2003). The project may also be subject to overlay timing restrictions imposed by the Washington Department of Fish and Wildlife (WDFW) in the Hydraulic Project Approval (HPA - not yet available). As discussed in Section XVIII, the site falls within an area of historic sockeye salmon (*Oncorhynchus nerka)* beach spawning.

Construction would take up to four weeks, with pile driving occurring over a 2 to 3-day period. Pile driving would be limited to the hours of 8:00 a.m. to 4:00 p.m., Monday through Friday.

B. Site preparation.

No special site preparation measures would be implemented for pier demolition and construction work. The in-water work area would be isolated with a weighted silt curtain whenever practicable.

C. Equipment to be used.

Pier demolition and replacement would be carried out using hand labor and a small, barge-mounted crane and pile driver (fixed-lead, drop-hammer or vibratory pile driver). If a drop-hammer pile driver is used, sound attenuation measures would include use of a bubble curtain (100% pile perimeter coverage), or a block of wood at least 6" thick placed between the pile driver and the pile.

Construction equipment would not access the shoreline via land and no trees or other notable shoreline vegetation would be disturbed or removed other than specified in Appendix A. The barge would not be allowed to ground on the shoreline.

D. Construction materials to be used.

Primary construction materials are specified in Attachment 1, page 3.

E. Work corridor.

Access to the site for construction personnel and equipment would be provided by boat or construction barge. These are in continuous use on Lake Sammamish and are moved from site to site on an as-needed basis.

F. Staging areas and equipment wash outs.

No local staging areas and equipment washouts have been identified as they are not expected to be necessary.

G. Stockpiling areas.

Short term stockpiling of debris and materials would be accommodated on the construction barge. All waste materials and pier debris would be transported offsite regularly for disposal in an approved upland facility.

H. Running of equipment during construction.

Equipment would only run during the period 8:00 a.m. to 4:00 p.m., Monday through Friday. In-water equipment would be operated in a manner that minimizes suspension of particulates in the lake. Equipment would be inspected daily to ensure there are no fluid leaks.

I. Soil stabilization needs / techniques.

Soil disturbance and planting would only occur above the OHWM. Thus, there is no need for soil stabilization / protection from inundation or wave action. As described in Appendix A, silt fencing would be used above the water's edge and a layer of mulch placed around each new tree and shrub. This would minimize erosive transport of soils during rainfall events.

J. Clean-up and re-vegetation.

All waste construction materials (old piles and decking) and non-native plant material would be removed promptly for offsite disposal. Re-vegetation would be conducted as specified in Appendix A.

K. Storm water controls / management.

No special storm water controls are proposed

L. Source location of any fill used.

Use of fill materials is not proposed.

M. Location of any spoil disposal.

Spoil disposal activities are not proposed.

X. ACTION AREA

The *action area* includes all areas at and around the project site that could be affected directly or indirectly by the project or interrelated and/or interdependent activities (USACE 2001). Because in-water pier construction activity would be limited to a small area, it is reasonable to expect all direct and indirect effects to occur within 100 feet of the construction site. Typical potential impacts would include temporary water quality degradation, disturbance of fish foraging, and destruction of riparian and aquatic vegetation. Short term transportation of equipment and materials to and from the site via the construction barge would not result in notable environmental disturbances in the lake and would not necessitate a larger action area.

The action area for operational boating activity associated with the replacement pier would include the riparian zone, open water, and shoreline of Lake Sammamish. According to the applicant, the site is already used for boat launching and mooring in the summer months. Thus, it is expected that the overall level of local boating activity would not increase significantly following pier construction.

No interrelated or interdependent activities are proposed or anticipated in association with the project. Thus, an action area for such activities is not defined.

XI. SPECIES INFORMATION

A. Species and Critical Habitat Present

Potentially affected fish and/or wildlife species occurring in the project vicinity that are protected under the Federal Endangered Species Act are shown in Table 1. The list includes three species of fish. State jurisdiction over each species is also shown in Table 1.

On September 2, 2005, NOAA Fisheries issued final rules to designate critical habitat in Washington, Oregon and Idaho for 12 species of salmon and steelhead listed as threatened or endangered under the ESA (US Fed. Reg. September 2, 2005). Included in these rules was a critical habitat designation for chinook salmon *(Oncorhynchus tshawytscha*) in the Puget Sound ESU, including waters of Lake Washington. The action area for this project occurs in the Puget Sound Subbasin, Unit 10, of the designated critical habitat for Chinook salmon.

On September 26, 2005, the U.S. Fish and Wildlife Service issued final rules to designate critical habitat for coastal Puget Sound Bull Trout (*Salvelinus confluentus*) (US Fed. Reg. September 26, 2005). The Sherwood project site occurs in Unit 28 of the critical habitat area. Although Lake Sammamish is not identified as critical habitat water body, it flows into Lake Washington which is a critical habitat water body (US Fed. Reg. September 26, 2005).

Table 1. Endangered Species Act Listed Species in the Project Vicinity

Species	Federal Status	Federal Jurisdiction	Listing Area	Origin / Type	State Status
Chinook Salmon *(Oncorhynchus tshawytscha)*	Threatened (March 1999 / June 2005)[1]	NOAA	Puget Sound ESU[2]	Native / Natural Spawning	Candidate
Steelhead *(Oncorhynchus mykiss)*	Threatened (May 2007)[3]	NOAA	Puget Sound DPS[4]	Native / Natural Spawning	Candidate
Bull Trout *(Salvelinus confluentus)* - with Dolly Varden *(Salvelinus malma)*[5]	Threatened (November 1999)[6]	USFWS	Coastal-Puget Sound DPS	Native / Natural Spawning	Candidate

B. Species Utilization

1. Chinook Salmon

Three major chinook populations are found in the Lake Washington watershed contained within the Puget Sound ESU: Bear/Cottage Lake Creek, Cedar River, and Issaquah Creek (NMFS 2000, Kerwin 2001). Subpopulations spawn in all major tributaries of the watershed. Recent analysis of genetic data indicates that geographic variation in spawning areas in North Lake Washington / Sammamish River and the Cedar River has resulted in genetic separation of these subpopulations (TRT 2003).

Virtually all naturally produced (wild) fish in the watershed are considered important for recovery of the ESU (Myers et al. 1998, NMFS 2000, BRT 2003). The number of wild spawners has been observed to decline in recent years, especially in the Cedar River (City of Seattle 2000, NMFS 2000, Houck and Warner 2000). In this river, the number of wild returning spawners has been consistently below the interim target goal of 1,200 spawners and sometimes falls below 200 (BRT 2003). In the Sammamish River, the number of wild spawners often falls below the interim target goal of 350 (BRT 2003). Wild chinook in Issaquah Creek are believed to have originated from the Issaquah Hatchery (Myers et al. 1998). Regular river escapement figures for these fish are not available but numbers of natural spawners are estimated to range from 500 to 1500 (Houck and Warner 2000).

[1] US Fed. Register, March 24, 1999 & June 28, 2005.
[2] Evolutionary Significant Unit
[3] US Fed. Register, May 11, 2007.
[4] Distinct Population Segment
[5] Proposed listing as "threatened" due to similarity of appearance to bull trout (applies only to Coastal Puget Sound bull trout Distinct Population Segment) - US Fed Register, January 9, 2001.
[6] US Fed. Register, November 1, 1999

General Life history information on chinook salmon is provided in the status reviews of West Coast chinook salmon prepared by Myers et al. (1998) and BRT 2003. Fish encountered in Lake Sammamish and Lake Washington spend most of their lives in the ocean and are thus called "ocean type". Adults begin migrating upstream through the lake from late June to August, usually spending only a few days in transit through the lake (Fresh 2000a, 2000b). Very limited feeding occurs during this time and adults avoid warm water of the lake littoral zone. From September to mid-December, adults spawn in major tributaries flowing into Lake Washington, the Sammamish River, and Lake Sammamish (Fresh 2000a). Lake beach spawning has been observed but is thought to be infrequent (Roberson 1967, City of Seattle 2000).

Spawning also occurs in hatcheries located at the University of Washington (Portage Bay) and Issaquah Creek. The Issaquah Creek hatchery is the largest facility and the single largest source of chinook spawners in the watershed. In 2003-2004, adult escapement was 5,742 fish and eggtake was 2,480,000 (WDFW 2005).

After hatching, some of the salmon fry begin immediate migration to Lake Sammamish, resulting in a population peak in the lake in January or February (Fresh 2000b). Another large group of juvenile chinook enters the lake in May and June. This second wave includes native fish as well as large numbers of fingerlings released from hatcheries. The majority of juveniles have migrated from the lake to the ocean (via the Ballard locks) by August (Fresh 2000a, 2000b).

During their time in the lake, juvenile chinook are likely to remain in the shallow littoral zone near the shoreline. According to Pflug (1981), juvenile salmonids are rarely found outside the littoral area in Lake Sammamish. In Lake Washington, subyearling chinook were found exclusively in the shallow littoral zone from February through May (Warner and Fresh 1999, Fresh 2000c, Tabor and Piaskowski 2002, Tabor et al. 2004). While in the lake, juvenile chinook feed largely on aquatic insect larvae and terrestrial insects (Wydoski and Whitney 1979). In Lake Washington and Lake Sammamish, feeding occurs predominantly at the mouths of streams where large numbers of chironomid (midge) pupae are found (Fresh 2000b, Koehler 2000).

Although no chinook were identified during October 2006 and November 2007 EcoPacific site surveys, the species is expected to be present at various times of the year. Both juveniles and adults may migrate by the Sherwood site and use the shallow littoral area for foraging or for cover. In general, habitat quality at the site would be considered moderate to poor relative to undeveloped areas of the lake. As discussed in Section XII, the Sherwood site exhibits a lack of favorable structural complexity in the littoral zone that is typical of a developed shoreline with little overhanging vegetation and submerged woody debris.

2. Steelhead

The Puget Sound steelhead Distinct Population Segment (DPS) includes naturally spawning steelhead stocks below natural and manmade impassable barriers, in streams and rivers ranging from the Canadian border (Nooksack River basin), south through Puget Sound and Hood Canal, north and west to the Elwha River, which empties into the eastern Strait of Juan de Fuca (WDFW 2008b). Steelhead are at risk of becoming endangered in the foreseeable future, and were formally listed as threatened on May 11, 2007 (US Fed. Register, May 11, 2007). The status of individual steelhead populations within Puget Sound is assessed based on factors such as abundance, productivity, diversity, and spatial structure.

The Lake Washington system contains a native winter steelhead stock but not a summer steelhead stock (WDF et al. 1993; WDFW 2006). The Cedar - Sammamish Watershed winter steelhead stock has recently been characterized as critical, due to a steady decrease in the mid-1980's (WDF et al. 1993; WDFW 2006). Recent escapement estimates of this stock have been consistently low (20 to 48) between 2000 and 2004, compared to more than 600 in the late 1980s (WDFW 2006).

A limited hatchery program utilizing native winter steelhead stock (Chambers Creek brood stock) was initiated in 1997 to assist in recovery of winter steelhead populations in the Lake Washington basin (WDFW 2008b). Unfortunately, steelhead originating from hatchery programs have very low survival rates and reproductive success (WDFW 2008b).

Wild steelhead spawning takes place throughout the Lake Washington basin including the Sammamish River and its tributaries, Issaquah Creek, Coal Creek, May Creek, the lower Cedar River and several smaller Lake Washington tributaries (WDFW 2006, PSBRT 2005). Adult winter steelhead typically return to the spawning river mouth from November through May or early June, with peak spawning occurring from mid-April through mid-May (WDFW 2008b).

O. mykiss is a highly polymorphic species and Washington watersheds can be inhabited by resident (rainbow or redband trout), anadromous (steelhead), or a mixture of both life history types. Non-anadromous rainbow trout spend their entire life-cycle in freshwater. The non-anadromous form occurs throughout the range of steelhead in the Pacific Northwest and in areas not accessible to steelhead due to geomorphology or human intervention.

In Lake Sammamish, resident rainbow trout are more likely to be present than anadromous steelhead. Although steelhead can spend from 1-7 years in freshwater (2 yrs is most common), they generally prefer faster moving water habitats found in streams (WDFW 2008b). At this time, very little is known about how steelhead use nearshore waters of Lake Sammamish. It is possible that considerable numbers of two-year old smolts travel by the project site during their seaward migration. This typically occurs from April to mid-May (PSBRT 2005).

3. Bull Trout

Bull trout *(Salvelinus confluentus)* and the closely related species Dolly Varden *(Salvelinus malma)* are not true trout but derivatives of a char species, perhaps Arctic char (WDFW 2000). The two species are impossible to differentiate visually so are usually evaluated and managed together as "native char". Historic range of native char in Washington is very wide and includes most river systems in both eastern and western parts of the state. The Coastal Puget Sound Distinct Population Segment (DPS) encompasses all Pacific Coast drainages north of the Columbia River in Washington (US Fed. Reg. November 1, 1999). This DPS is further subdivided into "analysis areas" in order to differentiate between various geographic trends in the population.

The project site falls within Puget Sound Analysis Area and is contained within the historic range of the native Sammamish River-Issaquah Creek sub-population and Chester Morse Reservoir sub-population (US Fed. Reg. November 1, 1999). Currently, both sub-populations are considered depressed (USFWS 2004). In recent years, very small numbers of bull trout have been recorded in Issaquah Creek, Chester Morse Reservoir, Cedar River, and Lake Washington (King County 2000, 2001). There is no known viable spawning subpopulation resident in Lake Washington or Lake Sammamish.

Although the new larger pier (+465 square feet) would cause additional potential shading in the littoral area, there are several factors that would tend to reduce the level of impact:

- The pier mainwalk (over the shallow littoral fringe) would be no more than 6 feet wide. Six feet is the minimum required for wheelchair access.

- ThruFlow™ interlocking panels would be used for all decking. This material has 43% of the top surface open for light passage (Cambridge Materials Testing 2004). Therefore, total direct light shading would be approximately 627 square feet (1,100 sq. ft. x 57% light restriction). In comparison, the existing wood decking (635 sq. ft., with no spaces between boards) has essentially zero light passage from above. The project would therefore likely result in a reduction in the total amount of direct artificial overwater shade in the action area.

- The bottom of the pier would be a minimum of 1.5 feet off the water surface (OHW) and no deck skirting is proposed.

With implementation of these measures, the project is expected to have a discountable probability of affecting Chinook salmon through increased shading.

4. Higher Predation Success by Piscivorous Fish

A number of fish species are known to prey on juvenile salmon as they migrate through Lake Sammamish and Lake Washington. Primary native predators include sculpins *(Cottus spp.),* northern pikeminnow (*Ptychocheilus oregonensis*), rainbow trout (*Onchorhynchus mykiss)*, cutthroat trout (*O. clarki*), and river lamprey (*Lampetra ayresi*). Major non-native predators include smallmouth bass (*Micropterus dolomieui*), largemouth bass (*Micropterus salmoides)*, and yellow perch (*Perca flavescens*) (Warner and Fresh 1999, Tabor and Chan 1996). The majority of salmon predation occurs during outmigration from late April through June (Fayram 1996, Fayram and Sibley 2001).

In recent years, much of the concern about effects of structures such as piers on predation has focused on smallmouth and largemouth bass (Kahler et al. 2000, Carrasquero 2001, Fresh et al. 2001). Both bass species are aggressive predators within the littoral zone and are known to feed opportunistically on smaller fish (Pflug 1981, Pflug and Pauley 1984, Fayram 1996, Malcolm 2000). Bass are also considered more of a nuisance because they are a non-native species (Fayram 1996).

In 1980, Pflug (1981) estimated the population of smallmouth in Lake Sammamish to be 5,715 bass over the length of 20 cm. Largemouth bass are expected to be considerably lower in number because they occupy less habitat within the lake (15% of total available habitat) compared to 65% for smallmouth (Pflug 1981). In Lake Washington, Fayram (1996) found the ratio of smallmouth to largemouth was approximately 7 to 1, although a high degree of uncertainty was noted. In general, largemouth bass prefer shallow weedy areas (Wydoski and Whitney 1979). This may account for their relatively low population abundance in Lake Sammamish.

The feeding behavior of largemouth bass may be influenced by presence of in-water structures in the shallow littoral zone. Largemouth bass spend most of their time during the day at depths less than 20 feet and are usually in close association with objects that provide cover such as brush, logs, pilings, submerged trees, and lily pads (Stein 1970, Wydoski and Whitney 1979, Pflug 1981). Stein (1970) reported that in Lake Washington, largemouth bass prefer heavy log and brush cover over other in-water structures (including docks). The primary function of this cover is probably to provide protection from predators. At night, when predator pressure is lowest, bass tend to move into more offshore areas to feed (Emery 1973, Wydoski and Whitney 1979, Helfman 1981).

It is possible that cover provided during the day by shallow water structures such as piers could improve success in catching juvenile salmon prey that venture into the shallow area beneath the docks. Experimental analysis of largemouth bass feeding behavior indicates that, at low light intensity, bass can often locate prey fish before they are detected by the prey (Howick and O'Brien 1983). This advantage is reversed under high light intensity conditions.

Feeding of smallmouth bass is expected to be less influenced by shallow, in-water structures. Generally, smallmouth are found in deeper water than largemouth (Rideout and Oatis 1975, Carlander 1975). Fayram (1996) found that smallmouth were less structurally oriented than largemouth. In Lake Sammamish and Lake Washington, preferred foraging habitat appears to be drop-offs or outcroppings where the substrate is hard and unvegetated (Pflug 1981, Pflug and Pauley 1984, Tabor and Chan 1996). Smallmouth also exhibit active hunting up into the water column and can venture into the pelagic (open water) zone (Coble 1979, Danehy and Ringler 1991).

In contrast to the general literature, Fresh et al. (2001) often observed non-nesting, adult smallmouth near docks in relatively shallow water in Lake Washington. However, type of substrate was a better predictor of the presence of bass, with a cobble bottom usually being preferred. Although, their research was inconclusive, Fresh et al. (2001) warn that care should be taken when placing additional in-water structures in shallow areas where smallmouth are known to be present.

Based on available information, it would appear that both smallmouth and largemouth bass have some potential for increased predation success as a result of construction of the Sherwood pier. However, there are several factors which would serve to lower the potential for site-specific effects on the local population of chinook salmon:

- The opportunity for significant predator-prey interaction is limited to the few months of the year when large numbers of juvenile salmon are migrating through the lake and may pass by the site.

- The largemouth bass population in Lake Sammamish is thought to be relatively small.

- The project would result in a reduction of the number of piles and these piles would be narrower than most other piles in the action area / project vicinity. This would tend to reduce attractiveness of the pier to salmon predators such as bass.

- Implementation of the SPP (Appendix A) would improve local chinook habitat quality and thus provide offsets for any negative impacts of the new pier.

With implementation of conservation measures described above, the project is expected to have a discountable probability of affecting chinook salmon through increased predation success of bass or other piscivorous fish.

5. Increased Predation by Enhancement of Bass Nesting Habitat

Largemouth bass generally construct nests at depths from 1 to 4 feet deep in vegetated areas with soft-sediment to gravel substrates (Hiedinger 1975, Wydoski and Whitney 1979). They may also select nest sites near underwater features such as rocks, stumps, drop-offs (Hiedinger 1975). In Lake Sammamish, Pflug (1981) found that largemouth bass have a strong preference for shallow weedy areas with soft substrates. Such conditions do not exist at the project site, so it is not likely that bass spawning occurs in the action area. Moreover, the new pier would not improve potential spawning conditions by introducing a more preferred structure or substrate in the shallow littoral fringe area (less than 4 feet deep). The probability of impacts on chinook salmon related to largemouth bass nesting would therefore be extremely low (i.e., discountable).

Smallmouth bass prefer to spawn in deeper waters and often use gravel and cobble areas that are devoid of vegetation (Coble 1975, Wydoski and Whitney 1979). The mean depth of spawning in Lake Washington was 6.3 feet, although the range extends from 4 to 12 feet (Fresh et al. 2001). Pflug and Pauley (1984) found that smallmouth bass in Lake Sammamish show a strong tendency to locate nests next to isolated underwater structures such as boulders, logs, and dockpilings. Malcolm (2000) also observed this feature in Lake Sammamish. In a survey extending 1.5 miles along the east side of the lake, he found 37 bass nests. Fifty one percent were found within 5.3 feet of a distinct in-water structure. Many of these structures were piles associated with piers. Presumably, these man-made structures are replacing the function of natural features such as submerged logs that have become scarce in most parts of the lake.

Although no scientific studies have been conducted for confirmation, it is generally thought that piles and other in-water structures provide a protective screening function for the bass nest and the males guarding it (Kahler et al. 2000, Carrasquero 2001). Accordingly, it is expected that size of the structure is significant and that larger size piles would be selected preferentially.

The spawning biology of smallmouth bass suggests that construction of new piers and other in-water structures can increase attractiveness of a location for spawning, especially when natural underwater structures are missing. This would have little potential for site-specific impacts on migrating chinook salmon because any surviving bass progeny would likely become dispersed throughout the lake. However, if new pier construction contributes to a cumulative increase in overall spawning success of bass in the lake, it could be considered a take of a listed species.

Although level of scientific uncertainty is high, the proposed pier project has the potential for increasing utilization of the action area by spawning smallmouth bass. Several factors would serve to lower these potential effects:

- The opportunity for significant predator-prey interaction is limited to the few months of the year when large numbers of juvenile salmon are migrating through the lake and may pass by the site.

- The project would result in a reduction in the number of piles and these piles would be narrower than most other piles in the action area / project vicinity. This would tend to reduce attractiveness of the pier to spawning bass.

- All remnants of the old boat launch railing system would be removed. This would tend to further reduce the attractiveness of the pier area to spawning bass.

- Implementation of the SPP (Appendix A) would improve local chinook habitat quality and thus provide offsets for negative impacts of the new pier.

With implementation of conservation measures described above, the project is expected to have a discountable probability of affecting chinook salmon through increased predation success of smallmouth bass (or other piscivorous fish) by enhancement of nesting habitat.

6. Disruption of Water Flow / Sediment Deposition

In studies of Flathead Lake, Montana, Lorang et al. (1993) found that piers can alter local patterns of water flow and sediment disposition. Erosion was often accelerated on the downdrift side of the pier and materials such as gravel tended to aggregate on the updrift side. Kahler et al. (2000) and Carrasquero (2001) speculate that this pattern of updrift aggregation can lead to increased availability of spawning habitat for smallmouth bass, an important predator of juvenile chinook.

The Sherwood pier replacement would result in a reduction in the total number of piles. As a result, it is expected that distribution of sand and gravel around the pier footprint would not be adversely affected. The proposed pier replacement should have a discountable probability of affecting chinook salmon through increased spawning gravel habitat for predatory smallmouth bass.

B. Steelhead

As discussed in Section XI.B.2, there is little information available on the occurrence of native winter steelhead in the project action area. It is possible that considerable numbers of two-year old smolts travel by the project site during their seasonal seaward migration.

1. Water Quality Impacts

Potential water quality impacts during construction would be the same as identified for chinook salmon (see Section XIII.A.1). Short-term, localized increases in turbidity may occur but would be minimized by the type of substrate and limited shoreline and in-water disturbance. Impacts to bull trout would be insignificant and/or discountable.

2. Noise and Vibration Effects

Potential noise and vibration impacts during construction would be the same as identified for chinook (see Section XIII.A.2). Impacts to steelhead would be insignificant and/or discountable.

3. Shading Effects

Potential shading impacts during construction would be the same as identified for chinook (see Section XIII.A.3). Impacts to steelhead would be insignificant and/or discountable.

4. Higher Predation Success by Piscivorous Fish

Potential impacts during construction would be the same as identified for chinook (see Section XIII.A.4). Impacts to steelhead would be insignificant and/or discountable.

5. Increased Predation by Enhancement of Bass Nesting Habitat

Potential impacts during construction would be the same as identified for chinook (see Section XIII.A.5). Impacts to steelhead would be insignificant and/or discountable.

6. Disruption of Water Flow / Sediment Deposition

As discussed in Section XIII.A.6, the pier project would not alter water / sediment transport patterns such that spawning gravel habitat for predatory fish is enhanced. Thus, impacts to steelhead are expected to be insignificant and/or discountable.

C. Bull Trout

As discussed in Section XI.B.3, there are few records of bull trout in Lake Washington. Given this paucity of evidence, it is unlikely there is an adfluvial population that regularly uses the lake. However, the possibility exists that anadromous bull trout (adults and sub-adults) could pass through the lake on the way to streams in the watershed. It is also possible that a few emigrants from the isolated Chester Morse Reservoir subpopulation occasionally reside in the lake.

1. Water Quality Impacts

Potential water quality impacts during construction would be the same as identified for chinook salmon (see Section XIII.A.1). Short-term, localized increases in turbidity may occur but would be minimized by the type of substrate and limited shoreline and in-water disturbance. Impacts to bull trout would be insignificant and/or discountable.

2. Noise and Vibration Effects

Potential noise and vibration impacts during construction would be the same as identified for chinook (see Section XIII.A.2). Impacts to bull trout would be insignificant and/or discountable.

3. Shading Effects

Adult and sub-adult bull trout passing through Lake Washington could feed in the littoral zone in the vicinity of the project site during months of the year when surface temperatures are below 15°C. As discussed in Section XI.B.3, diet of these bull trout is expected to be small fish such as perch and sculpin. These prey species can feed on benthic invertebrates such as may be found under and around the Sherwood pier.

Shading effects of the project could impact bull trout indirectly by reducing availability of food for prey fish species, resulting in a reduction of food for bull trout. However, bull trout are likely to be rare visitors to the project action area. As a result, the project has insignificant and/or discountable potential for take of bull trout.

4. Higher Predation Success by Piscivorous Fish

Potential for increased predation success by piscivores around piles would be much less than that identified for chinook salmon (see Section XIII.A.4) because there would be fewer and larger fish potentially exposed. With the protection provided by project design and implementation of conservation measures, impacts to bull trout are expected to be insignificant and/or discountable.

5. Increased Predation by Enhancement of Bass Nesting Habitat

Potential for increased predation on bull trout due to enhancement of bass nesting would be much less that that identified for chinook salmon (see Section XIII.A.5) because there would be fewer and larger fish potentially exposed. With the protection provided by project design and implementation of conservation measures, impacts to bull trout are expected to be insignificant and/or discountable.

6. Disruption of Water Flow / Sediment Deposition

As discussed in Section XIII.A.6, the pier project would not alter water / sediment transport patterns such that spawning gravel habitat for predatory smallmouth bass is enhanced. Thus, impacts to bulltrout are expected to be insignificant and/or discountable.

- If a drop-hammer pile driver is used, sound attenuation measures would include use of a bubble curtain (100% pile perimeter coverage), or a block of word at least 6" thick placed between the pile driver and the pile.

- Removal of vegetation on shoreline and new planting would be carried under controlled conditions (see Appendix A)

- Floating silt curtains would be deployed in the lake around the construction operation where practicable to control dispersion of any accidental short-term disturbance of sediments.

- All construction debris would be removed from the site and properly disposed of on land.

- ThruFlow™ dock panels would be used for the deck surface to facilitate increased light passage.

- Decking would be a minimum of 1.5 feet off the water surface and no deck skirting is proposed.

- A site-specific shoreline planting plan (SPP) has been developed (Appendix A). This involves removal of non-native vegetation and planting of native riparian plants, and ongoing maintenance and monitoring.

XVII. DETERMINATION OF EFFECT

The Sherwood pier project may affect, but is not likely to adversely affect, the following listed species:

- Puget Sound chinook salmon
- Puget Sound steelhead
- Coastal Puget Sound bull trout (and Dolly Varden)

Critical habitat is designated locally for Puget Sound chinook salmon. The Sherwood pier project may affect, but is not likely to adversely affect critical habitat for this species.

XVIII. ESSENTIAL FISH HABITAT

A. Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires that Federal agencies determine whether proposed actions may adversely affect Essential Fish Habitat (EFH) for federally-managed fish species (NMFS 1999b). EFH are "those waters and

substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (MSA Section 3). The purpose of an EFH assessment is to avoid, minimize, mitigate, or offset the impact of activities on EFH (NMFS 1999b). The Federal action agency must consult with NMFS if activities are likely to adversely affect EFH and subsequently modify the project and/or implement conservation recommendations. Procedures for identification of EFH and coordination among agencies are provided in the MSA implementing regulations (US Fed. Reg., December 19, 1997 - 50 CFR Part 600).

B. Identification of EFH

The Pacific Fishery Management Council (PFMC) has designated EFH for federally-managed fisheries within waters of Washington, Oregon, and California. Freshwater EFH in these states is designed to protect Pacific salmon. It includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon (PFMC 2000). Designated EFH species within the Lake Washington Hydrologic Unit (contains Lake Sammamish) include chinook, coho, and sockeye (PFMC 2000). Detailed EFH descriptions for these species can be found in PFMC (2000).

Chinook are known to be present in Lake Sammamish and could occur within the project action area in both juvenile and adult life stages. Coho exhibit a similar life history and are known to be present in the lake as well (Weitcamp et al. 1995). Sockeye may also be present in the vicinity as juveniles and adults and may occasionally spawn in gravels along the lake's shoreline (PFMC 2000, Gustafson et al. 1997). However, no evidence of sockeye spawning was found during the October 2006 survey and WDFW records (Fisher 2001) have not recorded spawning in the site vicinity in the past.

C. Effects of the Project

As described in Section XIII, the Sherwood project could result in detrimental short-term and long-term impacts to habitats of chinook salmon in the action area within Lake Sammamish. Similar potential impacts could occur for coho and sockeye salmon in the lake. Section XIII has also determined that all identified impacts are expected to be discountable and/or insignificant with implementation of conservation measures built into the project. These conservation measures are expected to be generally applicable to EFH and would tend to minimize potential impacts on EFH. Thus, it is concluded that the pier project would likely have no adverse impacts on designated EFH in the region.

XIX. REFERENCES

Banner, A., and M. Hyatt. 1973. Effects of noise on eggs and larvae of two estuarine fishes. *Trans. Am. Fish Soc.* 1:134-136.

Cambridge Materials Testing Ltd. 2004. *Test Report, Light Availability Otron Thruflow Dock Panel.* Prepared for Thruflow Inc. Wallaceburg, ON, Canada.

Blanton, S., R. Thom, A. Borde, H Diefenderfer, and J. Southard. 2002. *Evaluation of Methods to Increase Light under Ferry Terminals.* Battelle Marine Sciences Laboratory. Prepared for Washington Department of Transportation, April, 2002.

Blaxter, J.H.S, J.A.B. Gray, and E.J. Denton. 1981. Sound and startle responses in herring shoals. *J. Mar. Biol. Ass. U.K.* 61:851-869.

Brown, L.G. 1992. *On the Zoogeography and Life History of Washington's Native Char, Dolly Varden Salvelinus malma (Walbaum) and Bull trout Salvelinus confluentus (Suckley).* Report #94-04. Washington Department of Wildlife, Fisheries Management Division, Olympia. WA.

BRT (West Coast Salmon Biological Review Team). 2003. *Updated status of federally listed ESUs of West Coast salmon and steelhead.* U.S. Department of Commerce, National Marine Fisheries Service, Northwest Fisheries Science Center and Southwest Fisheries Science Center (July 2003).

Carlander, K.D. 1975. Community relations of bass, large natural lakes. p. 125-130. *In*: H. Clepper, [ed.] *Black Bass Biology and Management*, Sport Fishing Institute, Washington, D.C. 534 p.

Carlson, T.J. 1997. *Characterization of Underwater Sound Generated by Impact Pile Driving within the Context of the Response of Salmonids to Impulsive Sound.* Draft report not approved for public release, limited distribution. Technical Report EL-97-??(sic). US Army Corps of Engineers, Waterways Experiment Station, Stevenson WA. As reported in Carrasquero (2001).

Carrasquero, J. 2001. *Over-water Structures: Freshwater Issues.* Prepared by Herrera Environmental Consultants for Washington Departments of Fish and Wildlife, Ecology, and Transportation. April 12, 2001.

City of Bellevue. 2008. Vasa Creek Basin, Lake Sammamish Watershed. Description on the City's web page: http://www.bellevuewa.gov/pdf/Utilities/vasa2.pdf

City of Seattle. 2000. *Factors Affecting Chinook Populations, Background Report.* Prepared by Parmetrix Inc, Natural Resource Consultants, Inc. and Cedar River Associates. June 2000.

Coble, D. J. 1979. Smallmouth bass. p. 21-31. *In*: H. Clepper, [ed.] *Black Bass Biology and Management*, Sport Fishing Institute, Washington, D.C. 534 p.

Danehy, R.J. and N.H. Ringler. 1991. Ecology of smallmouth bass *(Micropterus dolomieui)* in nearshore of Lake Ontario Bay, Lake Ontario. *In*: D.C. Jackson [ed.] *The First International Smallmouth Bass Symposium*, 24-26 August 1989, Nashville TN.

Emery, A.R. 1973. Preliminary comparison of day and night habits of freshwater fish in Ontario lakes. *J. Fish. Res. Bd. Can.* 30:761-774.

Fayram, A.H. 1996. *Impacts of Largemouth Bass (Micropterus salmoides) and Smallmouth Bass (Micropterus dolomieui) Predation on Populations of Juvenile Salmonids in Lake Washington.* Masters Thesis. University of Washington.

Fayram, A.H. and T.H. Sibley. 2001. Impact of predation by smallmouth bass on sockeye salmon in Lake Washington. *North American Journal of Fisheries Management 20:81-89.*

Feist, B.E. 1991. *Potential Impacts of Pile Driving on Juvenile Pink and Chum Salmon Behavior and Distribution.* Masters Thesis, University of Washington. Seattle, WA.

Fisher, L. 2001. Area Habitat Biologist, Washington Department of Fish and Wildlife. Personal communication with Sally Lawrence (EcoPacific Environmental) and provision of unpublished data (salmonid beach spawning in Lake Washington and Lake Sammamish). July 28, 2001.

Fresh, K.L. 2000a. *Life History Overview of Chinook Salmon in the Lake Washington Watershed.* Paper presented at: the Conference on Selected Recent and Ongoing Research in the Greater lake Washington Watershed. Seattle. November 8 and 9, 2000.

_____, K.L. 2000b. *Habitat use and Movements of Juvenile and Adult Chinook Salmon in Lake Washington.* Paper presented at: Washington Lake Protection Association, 13th Annual Conference, Seattle. April 15, 2000.

_____, K.L. 2000c. *Distribution of Juvenile Chinook Salmon in Lake Washington.* Paper presented at: the Conference on Selected Recent and Ongoing Research in the Greater lake Washington Watershed. Seattle. November 8 and 9, 2000.

Fresh, K.L., D. Rothaus, K.W. Mueller, and C. Waldbillig. 2001. *Habitat Utilization by Predators, with Emphasis on Smallmouth Bass, in the Littoral Zone of Lake Washington.* Review Draft, November 30, 2001.

Gayaldo, P.F., and K. Nelson. 2006. Preliminary results of light transmission under residential piers in Lake Washington, King County, Washington: a comparison between prisms and grating. *Lake and Reservoir Management 22(3) 245-249.*

Gustafson, R.G., T.C. Wainwright, G.A. Winans, F.W. Waknitz, L.T. Parker, and R.S. Waples. 1997. *Status Review of Sockeye Salmon from Washington and Oregon.* NOAA Technical Memorandum NMFS-NWFSC-33. National Marine Fisheries Sevice. Northwest Fisheries Science Center. December 1997.

Hawkins, A.D. 1986. Underwater sound and fish behavior. Pp.114-151 *In* T.J. Pitcher, [ed.] *The Behavior of Teleost Fishes.* Johns Hopkins University Press, Maryland.

Heidinger, R.C. 1975. Life history and biology of largemouth bass. Pp. 11-20 *In* H. Clepper, [ed.] *Black Bass Biology and Management.* Sport Fishing Institute, Washington, DC. 534 p.

Helfman, G.S. 1981. Twilight activities and temporal structure in freshwater fish community. *Can. J. Fish. Aquat. Sci.* 38:1405-1420.

Houck, D. and E. Warner. 2000. *Population Trends.* Paper presented at: Conference on Selected Recent and Ongoing Research in the Greater lake Washington Watershed. Seattle. November 8 and 9, 2000.

Howick, G.L., and W.J. O'Brien. 1983. Piscivorous feeding behavior of largemouth bass: an experimental analysis. *Trans. Am. Fish. Soc.* 112: 508-516.

Kahler, T., M. Grassley, and D. Beauchamp. 2000. *A Summary of the Effects of Bulkheads, Piers, and other Artificial Structures and Shorezone Development on ESA-Listed Salmonids in Lakes.* Prepared for the City of Bellevue, Washington. Final Report. July 13, 2000.

Kerwin, J. 2001. *Salmon and Steelhead Habitat Limiting Factors for the Cedar – Sammamish Basin (Water Resources Inventory, Area 8).* Washington State Conservation Commission (WSCC). September 2001.

King County. 1998. *Lake Sammamish Water Quality Management Project, Final Report.* Department of Natural Resources, King County, Washington. July 1998.

_____. 2000. *Literature Review and Recommended Sampling for Bull Trout in King County*. Final Draft. King County Department of Natural Resources. June 12, 2000.

_____. 2001. *King County Bull Trout Program 2000 Bull Trout Surveys.* King County Department of Natural Resources. June 2000.

_____. 2003. http://dnr.metrokc.gov/wlr/waterres/streams/samsedindex.htm#abstract. Accessed December 17, 2003.

_____. 2005. *Chinook Salmon Conservation Plan, WRIA 8 – Cedar River, Lake Washington, Sammamish Watershed.* WRIA 8 Sterring Committee.

_____. 2007. Lake Sammamish Water Quality. In: *King County Department of Natural Resources Web Page* (splash.metrokc.gov).

Koehler, M. 2000. *Feeding Ecology of Juvenile Chinook Salmon in Lake Washington.* Paper presented at: the Conference on Selected Recent and Ongoing Research in the Greater lake Washington Watershed. Seattle. November 8 and 9, 2000.

Loring, M.S., J. A. Stanford, F.R. Hauer, and J.H. Jourdonnais. 1993. Dissipative and reflective beaches in a large lake and the physical effects of lake level regulation. *Ocean & Coastal Management 19:263-287.*

Malcolm, R. 2000. Fisheries Biologist, Muckleshoot Indian Tribe Fisheries Department. *Associations of Smallmouth Bass with Artificial Inwater Structures and Salmonid Predation in Lake Sammamish and Lake Washington.* Paper presented at: Washington Lake Protection Association, 13th Annual Conference, Seattle. April 15, 2000.

Myers, J. M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neeley, S.T. Lindley, and R.S. Waples. 1998. *Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California.* NAOO Tech Memo. NMFS-NWFSC-35. USDC, NOAA, NMFS, Seattle.

Myrick, C.A., F.T. Barrow, J.B. Dunham, B.L. Gamett, G. Haas, J.T, Peterson, B. Rieman, L.A. Weber, and A.V. Zale. 2002. *Bull Trout Temperature Thresholds Peer Review Summary.* Prepared for U.S. Fish and Wildlife Service. September 19, 2002.

National Marine Fisheries Service (NMFS), 1999a. *A Guide to Biological Assessments – with Attachments 1 and 2.* Washington Habitat Conservation Branch, Lacey, WA. March 23, 1999.

_____, 1999b. *Essential Fish Habitat Consultation Guidance.* NMFS Office of Habitat Conservation. November 1999. (www.nmfs.noaa.goc/habitat/efh/Consultation).

_____. 2000. *Guidance for ESA Section 7 Consultation, Effect Determinations for New and Replacement Piers and Bulkheads in Lake Washington.* NMFS Habitat Program/Olympia Field Office. July 26, 2000.

NMFS and US Fish and Wildlife Service (USFWS). 1994. *Draft Section 7 Endangered Species Consultation Handbook – Procedures for Conducting Section 7 Consultations and Conferences.* 59 Federal Register 65781. December 21, 1994.

Pacific Fishery Management Council (PFMC). 2000. *Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon.* Portland, Orgeon. May 2000.

Parametrix, Inc. 2002. *Shoreline Master Plan Update, Review Draft Existing Conditions Report and Habitat Evaluation.* Prepared for City of Issaquah. May, 2002.

Perkins. T. 2000. *Lake Sammamish Natural Shoreline Survey.* Watershed Company. August 15, 2000.

Pflug, D.E. 1981. *Smallmouth Bass (Micropterus dolomieui) of Lake Sammamish: a Study of Their Age and Growth, Food an Feeding Habits, Population Size, Movement and Homing Tendencies, and Comparative Interactions with Largemouth Bass.* M.S. Thesis, Univ. of Washington, Seattle, WA. 80 p.

Pflug, D.E. and G.B. Pauley. 1984. Biology of smallmouth bass *(Micropterus dolomieui)* in Lake Sammamish, Washington. *Northwest Science* 58:118-130.

Popper, A.N, and T.J. Carlson. 1998. Application of sound and other stimuli to control fish behavior. *Trans. Am. Fish. Society 127(5):673-707.*

Posten, Ted. 2001. *Treated Wood Issues Associated with Over-water Structures in Marine and Freshwater Environments.* Prepared for Washington Department of Fish and Wildlife, Washington Department of Ecology, and Washington Department of Transportation.

Puget Sound Biological Review Team (PSBRT). 2005. *Status review update for Puget Sound Steelhead.* National Marine Fisheries Service, Northwest Fisheries Science Center, 2725 Montlake Boulevard East, Seattle, Washington 98112.

Rideout, S.G., and P.H. Oatis. 1975. Population dynamics of smallmouth and largemouth bass in Quabbin Reservoir. p.216-221 *In*: H. Clepper, [ed.], *Black Bass Biology and Management.* Sport Fishing Institute, Washington, D.C. 534 p.

Roberson, K. 1967. An occurrence of chinook beach spawning in Lake Washington. *Trans. Am. Fish. Soc.* 96: 423-424.

Simenstad, C.A., B.J. Nightingale, R.M. Thom, and D.K. Shreffler. 1999. *Impacts of Ferry Terminals on Juvenile Salmon Migrating Along Puget Sound Shorelines. Phase I: Synthesis of State of Knowledge.* Report WA-RD 472.1. Washington State Transportation Center (TRAC), Seattle Washington.

Stein, J.N. 1970. *A Study of the Largemeouth Bass Population in Lake Washington.* M.S. Thesis, Univ. of Washington, Seattle, WA. 69 p.

Stock, M. and D.E. Schindler. 2000. *Effects of Long-term Environmental Change on Predation Rates.* Paper presented at: the Conference on Selected Recent and Ongoing Research in the Greater lake Washington Watershed. Seattle. November 8 and 9, 2000.

Tabor, R.A., and J. Chan. 1996. *Predation on Sockeye Salmon Fry by Piscivorous Fishes in the Lower Cedar River and Southern Lake Washington.* U.S. Fish and Wildlife Service, Western Fishery Resource Office, Olympia, WA. May 1996. 50p.

Tabor, R.A., and R. Piaskowski. 2002. *Nearshore Habitat Use by Juvenile Chinook Salmon in Lentic Systems of the Lake Washington Basin.* Annual Report, 2001. Prepared for Seattle Public Utilities, U.S. Fish and Wildlife Service, Lacey, Washington.

Tabor, R.A., J.A Sceurer, HA. Gearns, and E.P. Bixler. 2004. *Nearshore Habitat Use by Juvenile Chinook Salmon in Lentic Systems of the Lake Washington Basin.* Annual Report, 2002. Prepared for Seattle Public Utilities, U.S. Fish and Wildlife Service, Lacey, Washington.

Toft, J.D. 2001. *Shoreline and Dock Modifications in Lake Washington.* University of Washington School of Aquatic and Fishery Sciences. Prepared for King County Department of Natural Resources. October 2001.

Toft, J.D., J.R. Cordell, C.A. Simenstad, and L.A. Stamatiou. 2007. Fish Distribution abundance, and behavior along city shoreline types in Puget Sound. *North American Journal of Fisheries Management* 27:465-480.

TRT (Puget Sound Technical Recovery Team). 2003. Independent Populations of Chinook Salmon in Puget Sound. Final Draft. July 22, 2003. http://nwfsc.noaa.gov/cbd/trt.

U.S. Army Corps of Engineers (USACE). 2001. *Working Document for Preparation of a Biological Evaluation (BE) or Biological Assessment (BA).* CENWS-OD-RG, Regulatory Branch, Seattle District. February 5, 2001.

USACE. 2005. *Proposed Regional General Permit 3: Construction of New or Modification of Existing Residential Overwater Structures and Installation of Moorage Piling in Lake Washington, Lake Sammamish, the Sammamish River and Lake Union, Including the Lake Washington Ship Canal.* March 7, 2005.

USACE, U.S. Fish and Wildlife Service, and National Marine Fisheries Service. 2003. *Endangered Species Act Guidance for New and Replacement Piers and Bulkheads in Lake Washington, Lake Sammamish, and the Ship Canal, Including Lake Union.* Special Public Notice. October 25, 2001. Updated January 27, 2003. (www.nws.usace.army.mil/reg/reg.htm)

U.S. Fed. Register, December 19, 1997 (Volume 62, Number 244). *Magnuson-Stevens Act Provisions; Essential Fish Habitat - Interim Final Rule; Request for Comments.*

WDFW. 2000. *Final Bull Trout and Dolly Varden Management Plan.* Fish Management Program, Olympia WA.

_____. 2005. *2003/2004 Final Hatchery Escapement Report.* January, 2005.

_____. 2006. SalmonScape database. Available online at: http://wdfw.wa.gov/mapping/salmonscape/.

_____. 2008a. Priority Habitats & Species (PHS) Polygon Database Search for Lake Sammamish, Issaquah Quad. January 30, 2008.

_____. 2008b. *Oncorhynchus mykiss*: Assessment of Washington State's Steelhead Population and Programs. Preliminary Draft for Fish and Wildlife Commission. February 1, 2008.

Weitcamp, L.A., T.C. Wainwright, G.J. Bryant, G.J. Milner, D. Teel, R.G. Kope, and R.S. Waples. 1995. *Status Review of Coho Salmon from Washington, Idaho, Oregon, and California.* NAOO Tech memo. NMFS-NWFSC-24. USDC, NOAA, NMFS, Seattle.

Western Wood Preservers Institute (WWPI). 2006. *Best Management Practices for the use of Treated Wood in Aquatic Environments.* WWPI and Canadian Institute of Wood. July 1996 - USA / Canada Version amended to August 1, 2006.

Western Wood Preservers Institute (WWPi). 2001. *Guide to the Characteristics, Use, and Specifications of PressureTreated Wood.*

White, S.T. 1975. *The Influence of Piers and Bulkheads on the Aquatic Organisms in Lake Washington.* M.S. Thesis, Univ. of Washington, Seattle, WA. 132 p.

Wydoski, R.S. and R.R. Whitney. 1979. *Inland Fishes of Washington.* Univ. of Washington Press. Seattle.

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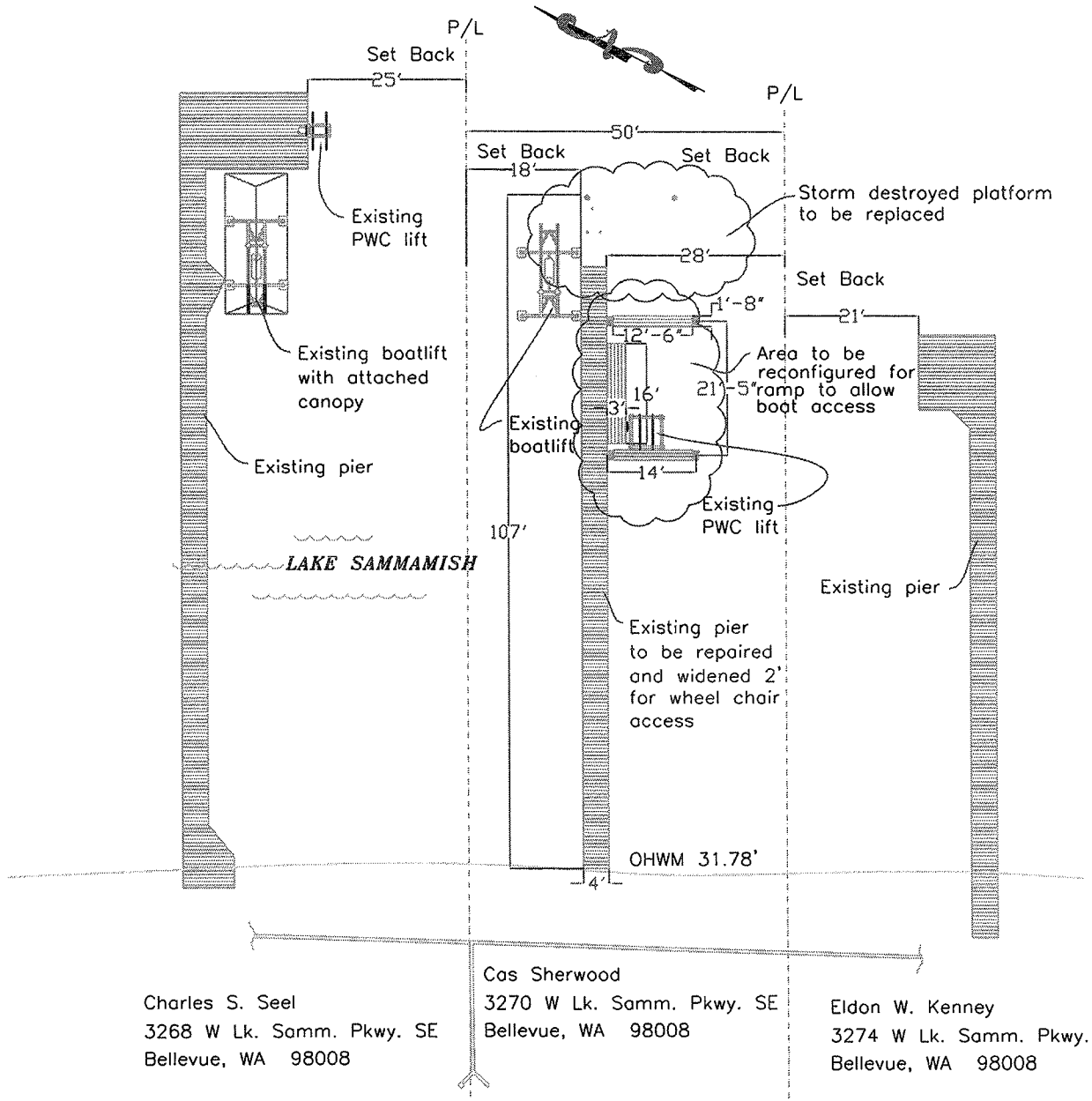
DRAWING BY: Gregory W. Ashley



SHORELINE PROJECT FOR : Cas Sherwood 3270 W Lk. Samm. Pkwy. SE **PAGE:** 1 of 3 Bellevue, WA 98008	**LOCATION:** Lake Sammamish **DATUM:** NAVD 88 **LAT:** 47° 37' 47" North **LONG:** 122° 05' 14" West **LENGTH FROM OHWM:** 105' **SQ. FT. :** 1100	**PROJECT DESCRIPTION:** Repair existing storm damaged pier. Increase width to 6' to accomodate ADA requirements. Install boatlift. **DATE:** 7/15/2007

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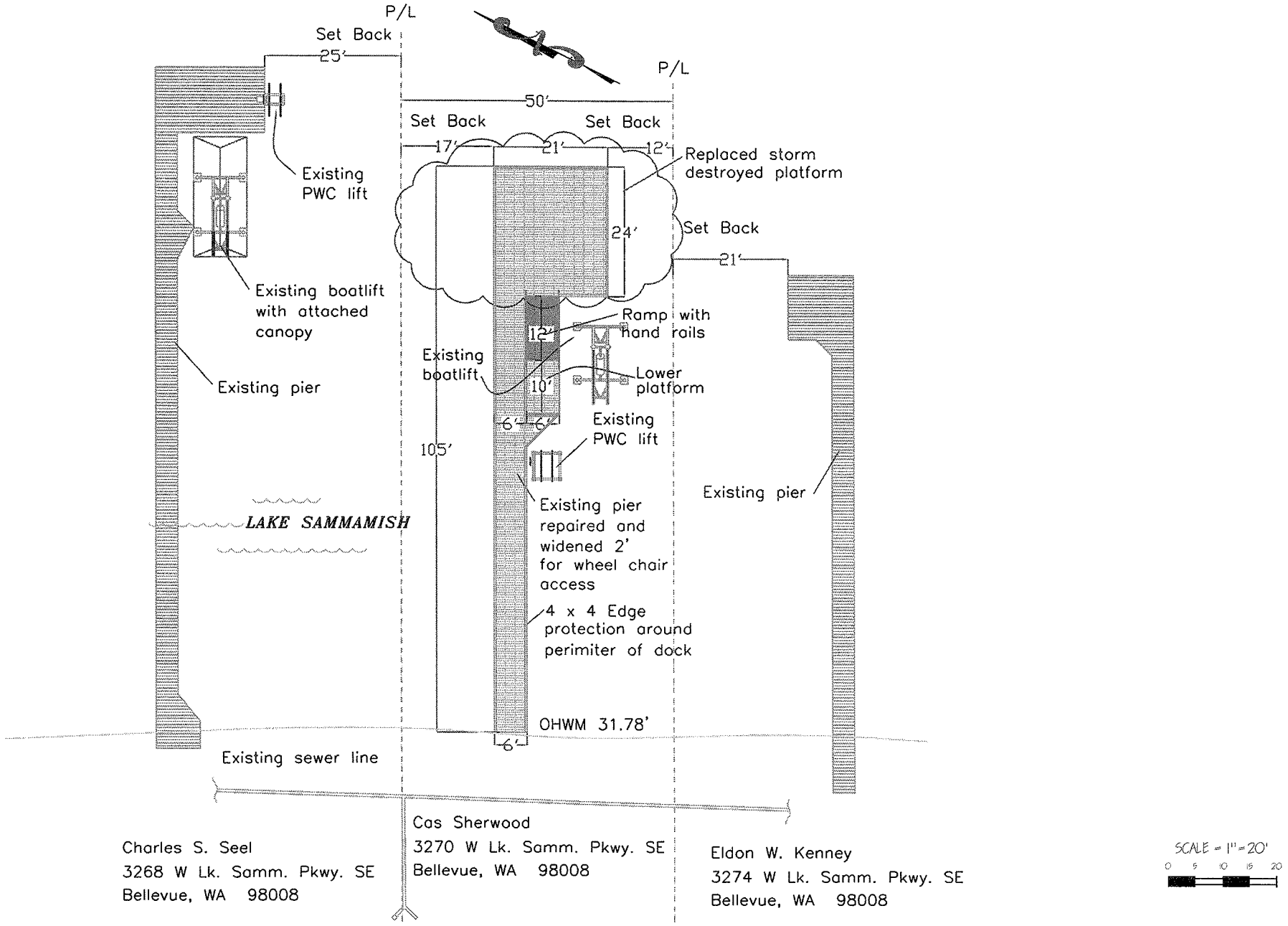

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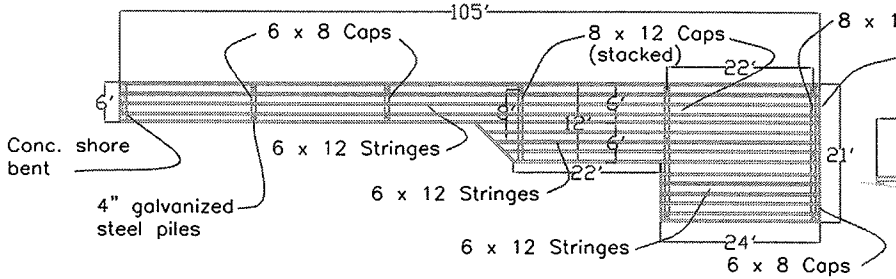
(TYP. DETAIL)



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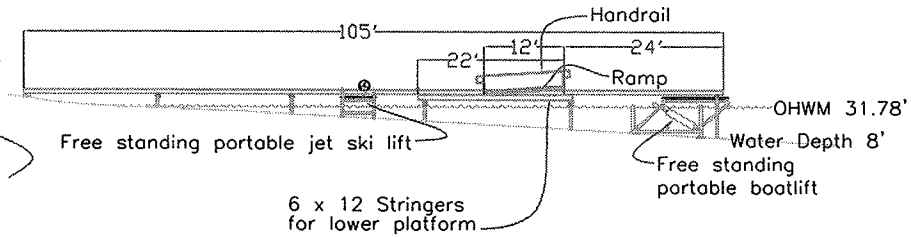
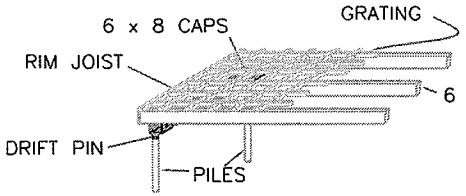
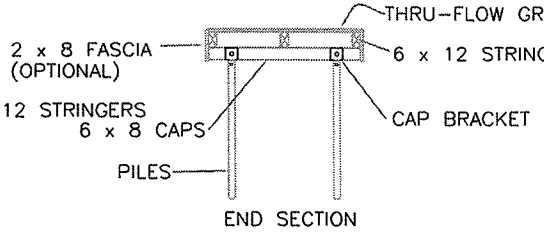


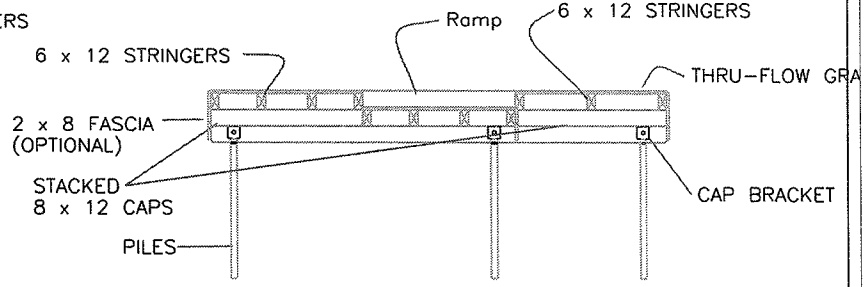
1. PILINGS TO BE MAXIMUM 22' O.C.
2. PILINGS TO BE 4" DIA. TYPICAL
3. CAPS ATTACHED TO PILINGS WITH GALV. CAP BRACKETS & 1/2" X 10" GALV. CARRIAGE BOLTS
4. STRINGERS TO BE MAXIMUM 18" O.C.
5. STRINGERS TO BE ATTACHED TO CAPS WITH 18" X 1/2" GALV. CARRIAGE BOLTS
6. DECKING ATTACHED TO STRINGERS WITH 3' # 10 S.S. SCREEWS

NOTES:
ALL PILINGS TO BE SCH 40 STANDARD WALL STEEL CASING
PILINGS DRIVEN TO REFUSAL
CAP MATERIAL TO BE DOUGLAS FIR # 2 OR BETTER -- ACZA TREATED TO .60 OR REFUSAL
STRINGER MATERIAL TO BE DOUGLAS FIR # 1 OR BETTER -- ACZA TREATED TO .40 OR REFUSAL
DECKING TO BE THRU-FLOW GRATING
PERIMETER OF DOCK TO HAVE EDGE PROTECTION
WHEEL CHAIR RAMP TO HAVE A SLOPE NO STEEPER THAN 1:12
WHEEL CHAIR RAMP TO HAVE A RISE OF LESS THAN 30 INCHES
WHEEL CHAIR RAMP TO HAVE A HANDRAIL ON OUTBOARD SIDE



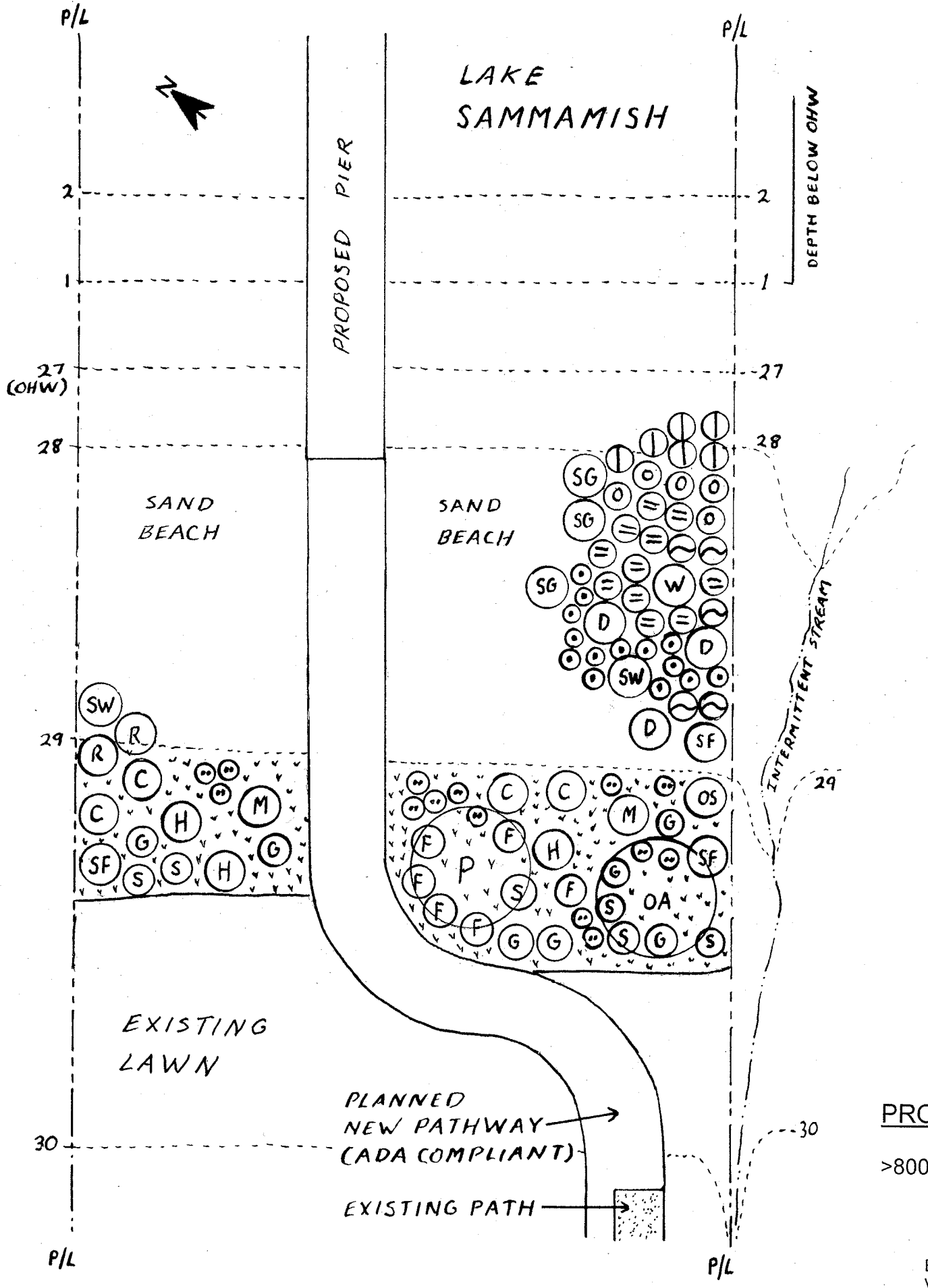


END SECTION



TYP. SECTION FOR RAMP AND PLATFORM
(Not to scale)

SHORELINE PROJECT FOR : Cas Sherwood 3270 W Lk. Samm. Pkwy. SE PAGE: 3 of 3 Bellevue, WA 98008	LOCATION: Lake Sammamish DATUM: NAVD 88 LAT: 47° 37' 47" North LONG: 122° 05' 14" West LENGTH FROM OHWM: 107' SQ. FT. : 1100	PROJECT DESCRIPTION: Repair existing storm damaged pier. Increase width to 6' to accomodate ADA requirements. Install boatlift. DATE: 7/15/07



Sym.	Qty	*Scientific Name* / Common Name	Cond.	Size	Spacing
OA	1	*Fraxinus latifolia* / Oregon ash	5 gal.	6-8'	as shown
P	1	*Pinus contorta var contorta* / Shore pine	5 gal.	6-8'	as shown
SW	2	*Salix scouleriana* / Scouler willow	cutting	4'	as shown (3/symbol)
W	1	*Salix sitchensis* / Sitka willow	cutting	4'	as shown (3/symbol)
D	3	*Cornus sericea* / Red osier dogwood	cutting	3-4'	as shown (3/symbol)
OS	1	*Holodiscus discolor* / Ocean spray	2 gal.	30-36'	as shown
M	2	*Philadelphus lewisii* / Mock orange	2 gal.	30-36"	as shown
C	4	*Ribes sanguineum* / Red-flowering currant	2 gal.	30-36"	4' o.c.
H	3	*Vaccinium ovatum* / Evergreen huckleberry	1 gal.	12-18"	as shown
R	2	*Rosa nutkana* / Nutka rose	1 gal	12-18"	4' o.c.
G	7	*Mahonia nervosa* / Oregon grape	1 gal.	12-18"	as shown
S	6	*Gaultheria shallon* / Salal	1 gal.	12-18"	as shown
SF	3	*Polystichum munitum* / Sword fern	1 gal.	8-12"	as shown
F	6	*Blechnum spicant* / Deer fern	1 gal.	8-12"	as shown
SG	3	*Myrica gale* / Sweet gale	1 gal.	12-18"	as shown
	14	*Arctostaphylos uva-ursi* / Kinnickinnick	1 gal.	2-4"	as shown
	70-75 (total)	Mixture (roughly equal numbers) of: *Fragaria chiloensis* / Wild strawberry; *Sisyrinchium angustifolium* / Blue-eyed grass; *Camassia quamash* / Common camas	4" pot	2-4"	1' o.c.
	14	*Iris tenax* / Pacific coast iris	4" pot	6-8"	1' o.c.
	11(44)	*Carex obnupta* / Slough sedge	plugs	8-10"	2' o.c. (4 plgs per symbol)
	5(20)	*Juncus effusus* / Common rush	plugs	8-10"	2' o.c. (4 plgs per symbol)
	5(20)	*Juncus ensifolius* / Dagger leaf rush	plugs	8-10"	2' o.c. (4 plgs per symbol)
	6(24)	*S. microcarpus* / Small fruited bulrush	plugs	10"	2' o.c. (4 plgs per symbol)

PROPOSED REVEGETATION

>800 SQ. FT. NATIVE PLANTINGS

Bathymetry: EcoPacific Env. Services, surveyed 10/07/06
Vertical Datum: 1929 NGVD

SHORELINE PLANTING PLAN (FOR AGENCY REVIEW)
Sherwood Residence – 3270 W. Lk. Sammamish Pkwy. SE, Bellevue, WA

SCALE: 1" = 10'	APPROVED BY:	DRAWN BY	T.M.
DATE: 3/1/07		REVISED	12/14/07

EcoPacific Environmental Services
2001 183 Ave NE Redmond, WA 98052
Phone (425) 746-5481 Email: ecopacific@seanet.com

EcoPacific

DRAWING NUMBER
SHEET 1 of 2

Sherwood Residence – Lake Sammamish
3270 W. Lk. Sammamish Pkwy. SE, Bellevue, WA 98008

SHORELINE PLANTING PLAN (SPP)
NOTES AND SPECIFICATIONS (3/1/07)

Objectives

The purpose of the SPP is to make environmental and aesthetic improvements on 50 feet of Lake Sammamish shoreline at 3270 W. Lake Sammamish Pkwy. SE, in Bellevue. These improvements are intended to act as impact reduction and conservation measures for a proposal to construct a replacement recreational pier at the site.

The Plan involves removal of non-native and invasive plants and replacement with over 800 sq. feet. of native shoreline species. This includes removal of Eurasian milfoil (*Myriophyllum spicatum*) in the lake adjacent to the site. New plantings include a mix of trees, shrubs, groundcover, and emergents.

Primary environmental benefits of the SPP are as follows:

- Provide a natural buffer (runoff treatment and wildlife habitat) between the residential property and the lake.
- Increase shading of the shallow littoral fringe with overhanging vegetation.
- Increase inputs of leaf litter, small woody debris, and detritus to the lake.
- Increase allocthonous inputs of insects to the lake.
- Facilitate more natural heterogeneous sorting of gravels at the water's edge

Responsibilities

Landscape planting elements (plant removal and replacement) shall be implemented by a landscape contractor experienced with shoreline planting projects. Milfoil removal shall be carried out by the owner or an aquatic plant removal contractor. Overall supervision of the SPP shall be carried out by the owner or a designated restoration ecologist (e.g. *EcoPacific*). Upon installation of new plantings, the site shall be inspected by the consulting ecologist and the SPP adjusted as necessary. The ecologist shall also be responsible for completion of routine site monitoring reports.

Landscape Planting Procedure

1. Install reinforced silt fencing along all portions of the shoreline to be disturbed. The fence shall be located at least 2' inland of the water's edge (at time of construction) and remain in place until landward plantings are installed and exposed soil areas are stabilized.

2. All non-native and invasive vegetation on the beach and in new planting areas shall be removed for offsite disposal. This shall include but not be limited to: purple loosestrife *(Lythrum salicaria)*, garden loosestrife (*Lysimachia vulgaris*), birdsfoot trefoil (*Lotus corniculatus*), reed canary grass (*Phalaris arundinacea*), yellow iris (*Iris pseudacorus*), Himalayan blackberry (*Rubus discolor*). Care shall be taken to prevent invasive plant material from entering the lake.

3. Digging of planting holes should not result in the need for importing topsoil. If a small amount of imported soil is required, it shall be aged, weed free, and contain 10-20% organic matter by volume. Where possible, native soil shall be used for backfilling the bottom half of planting holes.

4. SoilMoist, or an equivalent soil moisture retention agent, shall be added to topsoil backfill of all tree and shrub planting holes as per the manufacturer's specifications.

5. Install plantings as per Sheet 1, preferably during the dormant season (Nov.-March). Bare root specimens may be used during the dormant season if properly handled. Container or balled-in burlap specimens shall be used for planting during the growing season. Plant materials shall be local genetic stock (western WA, OR, or BC), healthy, bushy, and true to size, name, and variety. The landscape contractor shall have discretion to substitute alternative planting methods or materials (size, condition, spacing, etc.) following assessment of site-specific conditions. Substitution of different species, smaller size, or greater spacing shall not be allowed without prior approval of the consulting ecologist and/or USACE. Substantive changes shall be recorded upon completion of work.

6. Cuttings shall only be planted from Dec. through March. In other months, live rooted or container saplings shall be substituted. Cuttings shall be at least .5" in diameter and have a minimum of 4 lateral buds above ground after planting. Cuttings must be fresh (<24 hrs. from cutting), kept moist, and have side branches cleanly removed and bark intact. Butt ends shall be cleanly cut at an angle for easy insertion and dipped in a plant rooting hormone prior to planting. A pilot hole of at least 18" shall be made prior to planting in dense and gravelly soils. Cuttings shall be inserted to a depth of at least 18", leaving a minimum of 30" extending above ground.

7. Emergent plugs shall be planted above the current level of lake inundation. If in-water planting is attempted, protective measures must be used to ensure the plugs are not destroyed by wave action and stems [if plant is non-dormant] must extend above the water surface by at least 6". Plugs shall have healthy rhizomes and tops and apparent growing buds. Leaves and stems shall be clipped a small amount prior to planting to encourage root production.

8. Plant spacing for listed species shall be somewhat random (naturalistic) and not in a regular grid pattern. On-center spacing in the plant list indicates the "average" spacing distance.

9. A 3" layer of mulch shall be placed around the base of each tree (36" diameter ring) and shrub (24" diameter ring) for erosion, weed control, and moisture retention. This only applies to plantings above 29' NGVD Vertical Datum.

10. Following completion of planting, all exposed areas of disturbed erodible soil up to 29' elev. shall be covered with non-floating erosion control material such as a staked coir blanket. Temporary fencing, mesh cylinders, or plastic tree guards shall be installed around new vegetation susceptible to physical damage or feeding by animals such as dogs, beavers, geese, and ducks. The owner or consulting ecologist shall remove protective materials when appropriate (after one or two growing seasons).

11. The landscape contractor shall guarantee survival of all plant materials for one growing season. However, he shall not be responsible for mortality or damage caused by high wave action, unusual inundation (above 28.2' elevation), unavoidable destruction by animal pests, or lack of proper maintenance (see below).

Milfoil Removal Procedure

1. Milfoil shall be selectively harvested from the nearshore area along the entire length of the property. The goal shall be >80% removal of milfoil biomass in the zone of dense growth (approx. 5 – 10' below OHWM) while preserving >60% biomass of native submergent species. Milfoil removal shall be conducted a minimum of once per year for 5 years.

2. Either manual or mechanical harvesting methods shall be used, in compliance with Washington Department of Fish and Wildlife (WDFW) regulations outlined in *Aquatic Plants and Fish. WDFW. Publication #APF-1-97. 1997.* Because of the small size of the operation, this WDFW pamphlet can serve as the Hydraulic Project Approval (HPA) for the project. All in-water work shall be conducted within the HPA approved work window (July 16 – September 15).

Maintenance and Monitoring

Maintenance and monitoring shall be the responsibility of the owner and/or his designated representative. The performance goal for new plantings shall be 100% survival for the first two years and 80% survival in subsequent years. The owner/representative shall have the responsibility to document that this goal is maintained in "good faith" for a minimum of five years. Ongoing maintenance and monitoring shall include the following:

- Care not to use chemical pesticides or phosphorus (P) fertilizer in the shoreline planting area. If fertilizer is required, it shall be a P-free formulation such as "Lake Whatcom Blend" (Whatcom Farmers Coop.).
- Regular watering with care not to over water and cause soil erosion. Once plants are established (after one or two full growing seasons), little or no watering should be required.
- Weeding to remove non-native and invasive species. Over the long term, allow natural colonization of other native species if such growth is not highly invasive.
- Regular inspection and repair of erosion control materials and wildlife protection features until they are no longer needed.
- Replacement of plants as required once the obligation of the landscape contractor is over. The site is known to be subject to occasional high wave action. If this results in repeated destruction of low elevation plantings (e.g., sedges and rushes below 28.2 feet NGVD), the owner can discontinue replacement planting at his/her discretion and note this in the monitoring record.
- Submission of a "Status Report for Impact Reduction Construction" within one year of USACE permit issuance (see *Appendix D of Proposed USACE Regional General Permit 3, March 2005*).
- Submission of a "Mitigation Planting Monitoring Report" annually for five years following USACE acceptance of the "Status Report" (see *Appendix E of Proposed USACE Regional General Permit 3, March 2005*). Note: Clear photographs of the entire shoreline area shall be taken before work occurs, immediately after project installation, and at least once each year for five years.
- During the monitoring period, the owner shall allow periodic site inspections by NMFS/USACE or qualified individuals specified by these agencies. Agency monitors shall notify the applicant at least one week prior to the inspection.