

#### **IV. Establishing Minimum Jurisdiction for Select Lakes**

The following study was undertaken to establish the Ordinary High Water Mark and/or Associated Wetlands for select lakes within the Olympia, Lacey, and Tumwater urban areas as part of the Shoreline Master Program Update process.



**Wetland and Wildlife Consulting Services**

416 S. Washington St., Suite 202

Olympia, WA 98501

(360) 352-9897

FAX (360) 352-9914

**SHORELINE REVIEW**  
**FOR THE**  
**SHORELINE MASTER PROGRAM**

**Lacey, Olympia, Tumwater, Thurston County**

**APRIL 2008**

**prepared for:**

**Thurston Regional Planning Council  
Steven W. Morrison, Senior Planner  
2424 Heritage Court SW, Suite A  
Olympia, WA 98502**

**prepared by:**

**Steve Shanewise, PWS  
Senior Ecologist**



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## CONTENTS

Executive Summary .....	1
Introduction.....	2
Methods.....	3
Results.....	4
A. Barnes Lake.....	4
B. Bigelow Lake.....	4
C. Chambers Lake.....	4
D. Long Lake North .....	5
E. Setchfield Lake .....	5
F. Smith Lake.....	5
G. Susan, Munn, and Trails End Lakes.....	6

### Appendix: Maps

- Barnes Lake
- Bigelow Lake
- Chambers Lake
- Long Lake North
- Setchfield Lake
- Smith Lake
- Susan, Munn, and Trails and Lake

## **EXECUTIVE SUMMARY**

This report documents work performed to assist Thurston Regional Planning Council (TRPC) in updating the Shoreline Master Program (SMP) for the cities of Lacey, Olympia and Tumwater and their urban growth areas.

Field work was performed during winter high water conditions to determine the Ordinary High Water Mark (OHWM) and associated wetlands for all or portions of seven separate lake systems. Washington Department of Ecology personnel provided assistance through field review, particularly if any determination was difficult. TRPC provided detailed GIS maps for use in field review, including aerial photographs, topography and LIDAR depictions of each system reviewed.

Two systems reviewed, Smith and Setchfield Lakes, were determined to be below the 20-acre minimum for Shoreline jurisdiction. Trail's End Lake was determined to not be associated with the Susan/Munn Lake system, and would therefore also fall below the 20-acre Shoreline minimum.

Barnes Lake, which was not previously administered through Shoreline jurisdiction, was mapped at over 34 acres; putting it well within the 20-acre minimum limit for such jurisdiction.

Long Lake North had minor adjustments (increases) to the mapped OHWM, resulting in slight extensions of Shoreline jurisdiction within the adjacent landscape. The final two systems reviewed, Chambers, and especially Bigelow Lake, had significant expansions of OHWM and, for Bigelow, associated wetlands. Indeed, Bigelow Lake changed from being below the 20-acre minimum for Shoreline jurisdiction to exceeding 78 acres of OHWM area.

## **INTRODUCTION**

Thurston Regional Planning Council (TRPC) is updating the Shoreline Master Program (SMP) for the cities of Lacey, Olympia, and Tumwater and their urban growth areas. This SMP update is being done in cooperation with Thurston County. Assistance was sought by TRPC to help locate the Ordinary High Water Mark (OHWM) and the extent of associated wetlands on several lakes within the three cities. This report documents the findings of that field review.

SHORELINE REVIEW FOR THE SHORELINE MASTER PROGRAM

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## METHODS

### 1. **Winter Ordinary High Water Mark Conditions**

Field reviews for this project were primarily conducted during the month of March to coincide with the normal, seasonal occurrence of the OHWM conditions within the lakes. This allowed for maximum ease and certainty of locating the OHWM by simply identifying the extent of surface water conditions within each landscape.

### 2. **Ordinary High Water Mark Review**

Specific field reviews involved accessing each system at as many points as possible around the perimeter shorelines. The number of individual points accessed at each lake was based on Best Professional Judgment of what would be necessary to determine the OHWM condition for the entire system. Public access points were always used where available, but access permission from private landowners was also requested if no public access was available. However, not all private access requests were successful; Some landowners denied access and others were not available for consent.

### 3. **Associated Wetland Review**

Determination of the extent of associated wetlands was performed simultaneously with the OHWM field review in many cases, and also included review of Thurston County Soil Maps, aerial photography, topography and LIDAR maps. Finally, personal knowledge from previous field work was frequently used.

### 4. **GIS Mapping**

Thurston Regional Planning Council generated all the GIS maps for this analysis. They provided high quality, matched sets of aerial photography and LIDAR depictions of the shoreline landscapes reviewed. These maps also displayed the existing designated shoreline boundaries, as well as photo-interpreted wetland conditions. These maps were especially helpful in determining the extent of associated wetlands. TRPC remapped the location of the OHWM based upon field reconnaissance. TRPC also provided the area of calculations from these GIS maps to determine the SMA Jurisdiction in this report.

### 5. **Washington Department of Ecology Assistance**

On 10 March and 7 April 2008, Brad Murphy of the Washington Department of Ecology assisted with field reviews and made jurisdictional determinations where conditions were not clear. Specifically, Mr. Murphy made the determination of OHWM association for Trails End Lake and the north end of Long Lake North. He also reviewed portions of OHWMs for Barnes, Bigelow and Setchfield Lakes.

SHORELINE REVIEW FOR THE SHORELINE MASTER PROGRAM

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## RESULTS

### A. Barnes Lake

Much of the Barnes Lake shoreline was viewable from public roads. Direct shoreline access was made at two locations. This system has almost no associated wetlands due to the highly developed shoreline. It appears that past grading activities have basically pushed upland ground right up to the edge of the OHWM. Only minor adjustments were made to the previous OHWM depiction. The area of the OHWM for Barnes Lake is well above the SMA jurisdictional threshold at approximately 34.7 acres. TRPC remapped the location of the OHWM based upon the new delineation.

### B. Bigelow Lake

The mapped OHWM for this system was confined to the open water portion of the lake. Field review determined that the actual OHWM extends dramatically beyond this limit into densely vegetated emergent, shrub and forested wetlands around the entire perimeter of open water. In addition, because the overall system has been significantly drained by past ditching, extensive areas of associated wetlands occur well beyond the current OHWM limit.

Field access to this system was fairly comprehensive except for portions of the central east and west shorelines, and most of the southwest lobe, where access was limited to only a handful of sites. In this latter location, the extent of the OHWM was primarily identified through vegetation patterns on aerial photography and not from ground-truthed review of the existing waterline. However, the edge of associated wetlands here, as well as throughout the remainder of the system, were precisely identified through topography (uplands rise distinctly from a flat wetland bottom) and previous delineation work. The area of the OHWM for Bigelow Lake is now well above the SMA jurisdictional threshold at approximately 78.1 acres. TRPC remapped the location of the OHWM based upon the new delineation.

### C. Chambers Lake

Field review for this system only included the south end of both lake basins. The mapped OHWM for this system was limited to the visible open water of the lake. The actual OHWM is located another 10 to 100 feet further out into the lake from this old limit within vegetated wetland, and the associated wetlands then extend another 10 to 200 feet beyond this. Nearly the entire shoreline reviewed for this system was directly checked in the field because it is primarily public land. Chambers Lake has been drained in the past and is managed by an active Drainage District. The area of the OHWM for Chambers Lake is well above the SMA

SHORELINE REVIEW FOR THE SHORELINE MASTER PROGRAM

jurisdictional threshold at approximately 142.7 acres. TRPC remapped the location of the OHWM based upon the new delineation.

#### **D. Long Lake North**

Review of this system was limited to the outfall channel at the north end of the lake. The mapped OHWM for Long Lake North stops at a vegetation break between emergent and shrub habitat conditions. Field review confirmed that the OHWM extends throughout the shrub as well as emergent areas. TRPC remapped the location of the OHWM based upon the new delineation.

Review here also focused on whether the Long Lake North SMA jurisdiction should extend north to include Long Pond and its associated wetlands. WDOE aided in the field delineation at this site, and concluded that the railroad embankment crossing the outfall from Long Lake North constituted a significant break in hydrology and sustained a “uni-directional” flow through this artificial barrier. The railroad embankment therefore will constitute the new northern limit of SMA jurisdiction for Long Lake North. Long Pond, by itself, is below the jurisdictional minimum of 20 acres for shoreline designation.

#### **E. Setchfield Lake**

The mapped OHWM for this system was confined to the open water of the lake. Field review determined that the actual OHWM extends considerably beyond this limit into densely vegetated shrub and forested wetlands around the entire perimeter of interior open water. Field review included walking nearly all of the northern and southern portions of the system, plus some of the west side; access to the east side was not achieved.

The northern limit of the OHWM was determined (Brad Murphy, WDOE) to be the point where surface water from the lake begins to drain out through a defined, excavated channel, separating Setchfield Lake from an extensive, connected wetland system to the north. Even though the true OHWM designation for this system increased considerably to 18.88 acres from the previous shoreline depiction, it continues to fall below the 20 acre minimum threshold for SMA jurisdiction. TRPC remapped the location of the OHWM based upon the new delineation.

#### **F. Smith Lake**

The primary focus for this system was to determine if the mapped OHWM was accurate because it was within one acre of the SMA’s jurisdictional 20-acre threshold. However, brief review of the north and south ends of the lake determined that the mapped depiction was actually excessive. The area of the

SHORELINE REVIEW FOR THE SHORELINE MASTER PROGRAM

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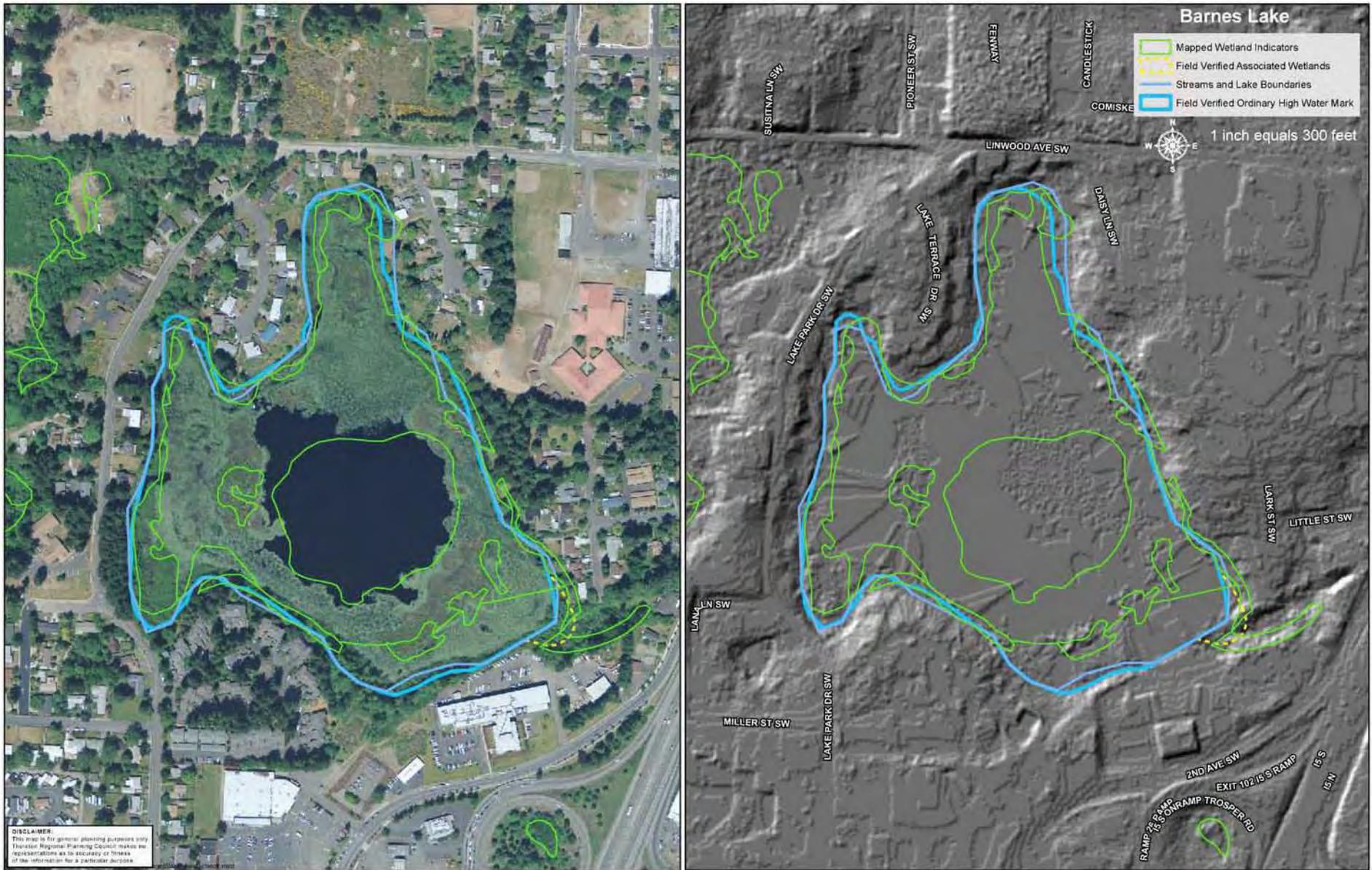
OHWL for Smith Lake is well below the SMA jurisdictional threshold at approximately 17.1 acres. TRPC remapped the location of the OHWM based upon the new delineation.

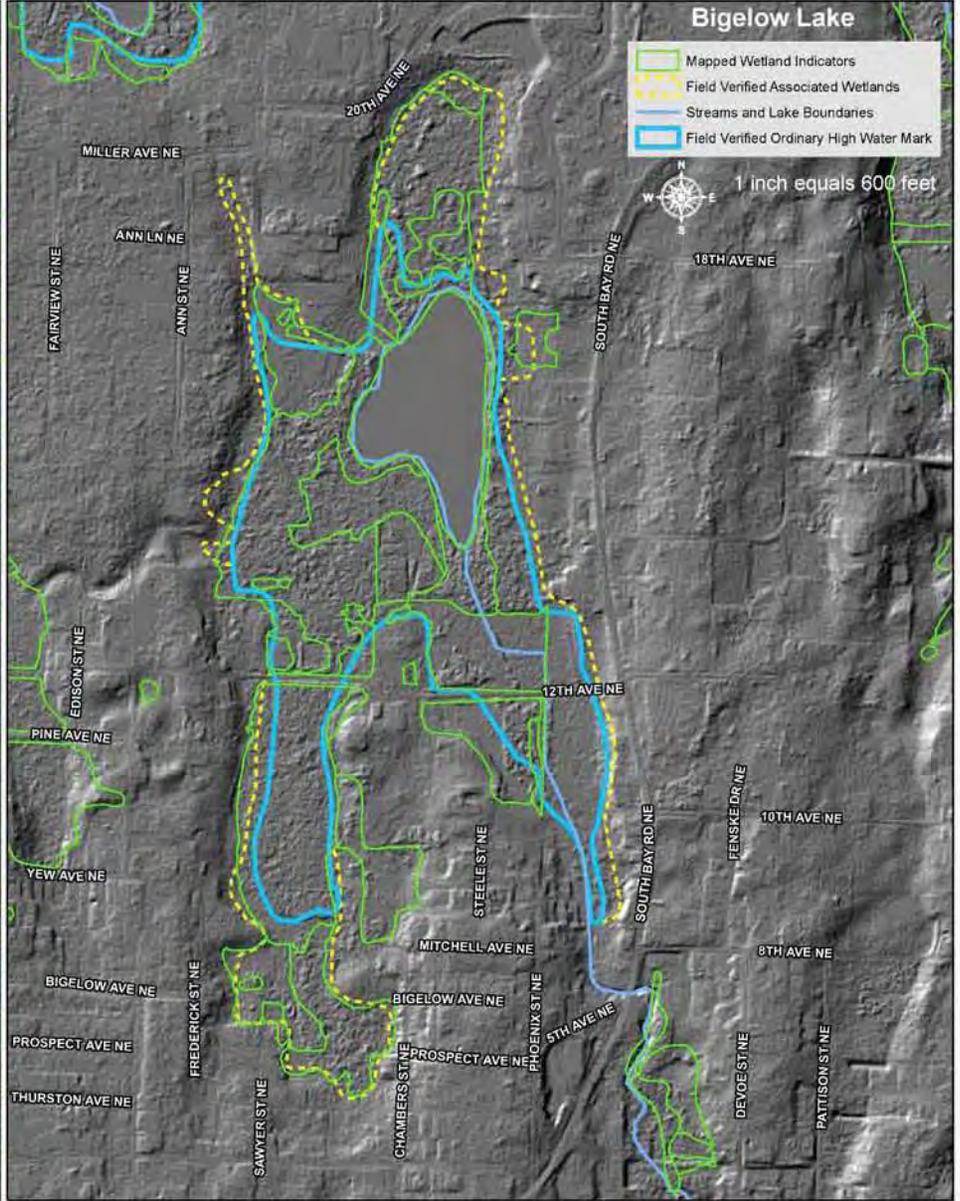
**G. Susan, Munn, and Trails End Lakes**

This site was investigated to determine whether or not Trails End Lake would be considered connected to Munn Lake, and therefore part of Shoreline Management Act (SMA) jurisdiction. Because the water flow through the road culvert connecting Trails End Lake to Munn Lake was determined to be “uni-directional” (water only flows from Trails End to Munn, and never the reverse). Trails End Lake was determined to not be a part of the Munn/Susan Lake system for purposes of determining SMA jurisdiction. Once this determination was made, no further review of the OHWM or associated wetland conditions for Trails End Lake were performed.

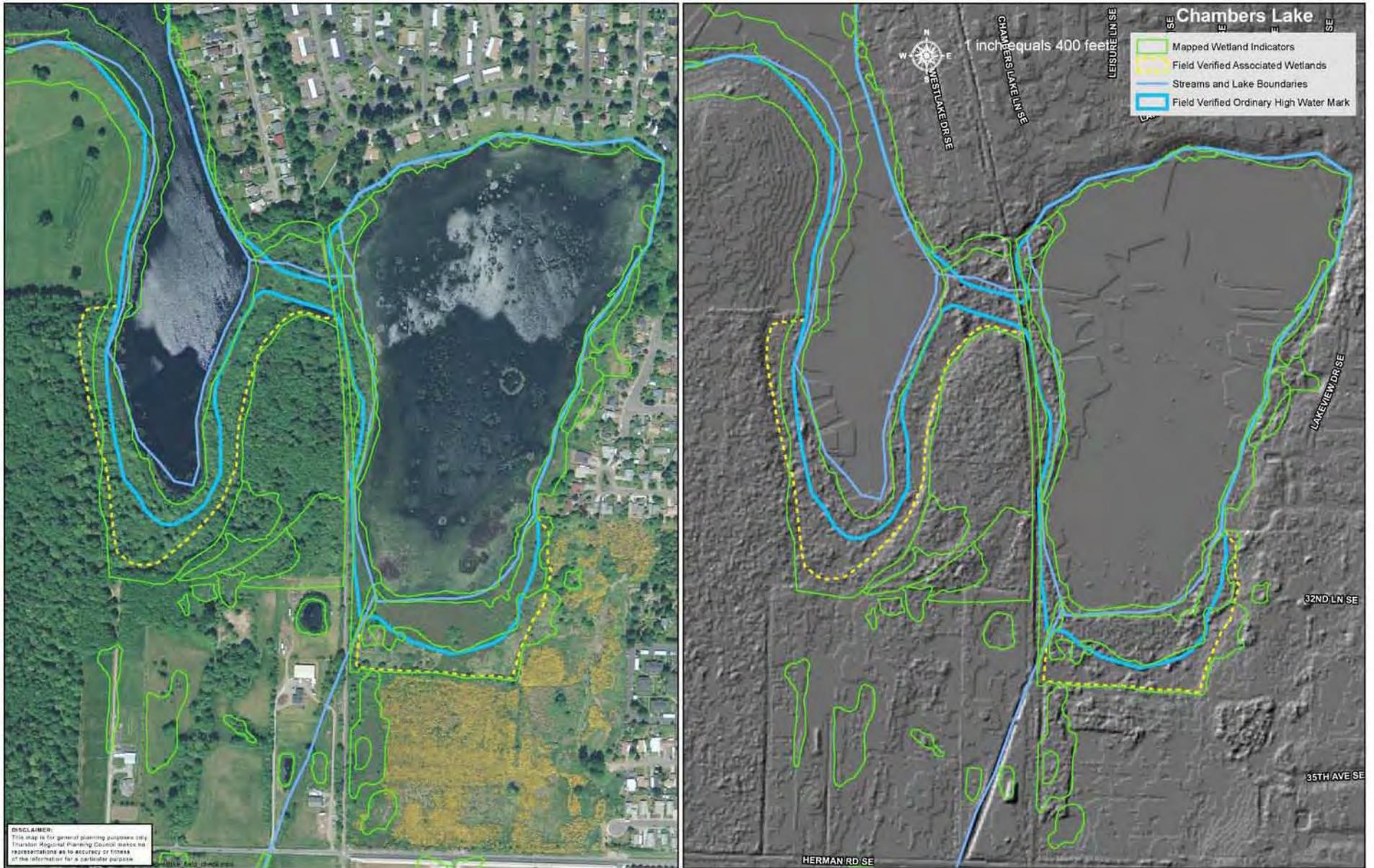
**APPENDIX I: MAPS**

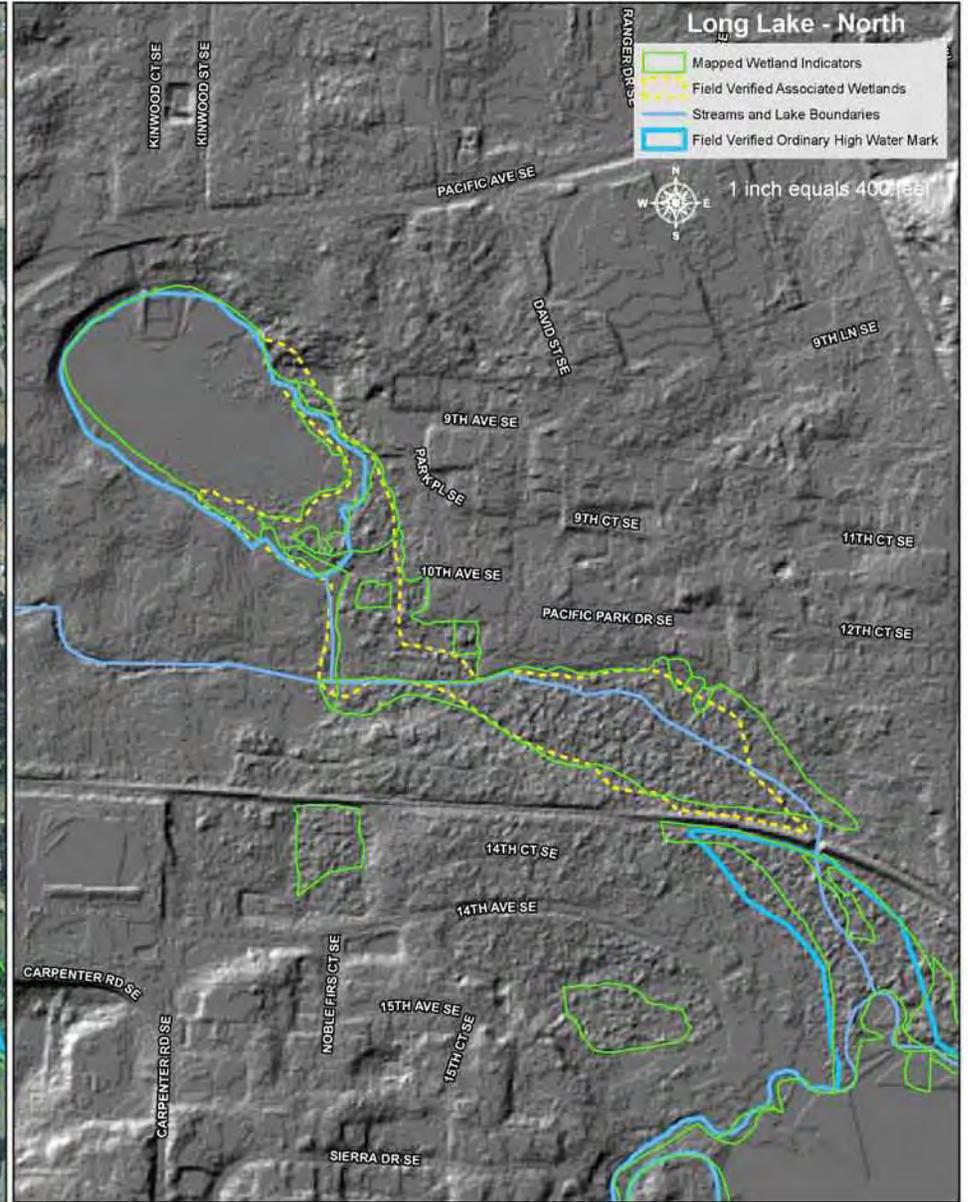
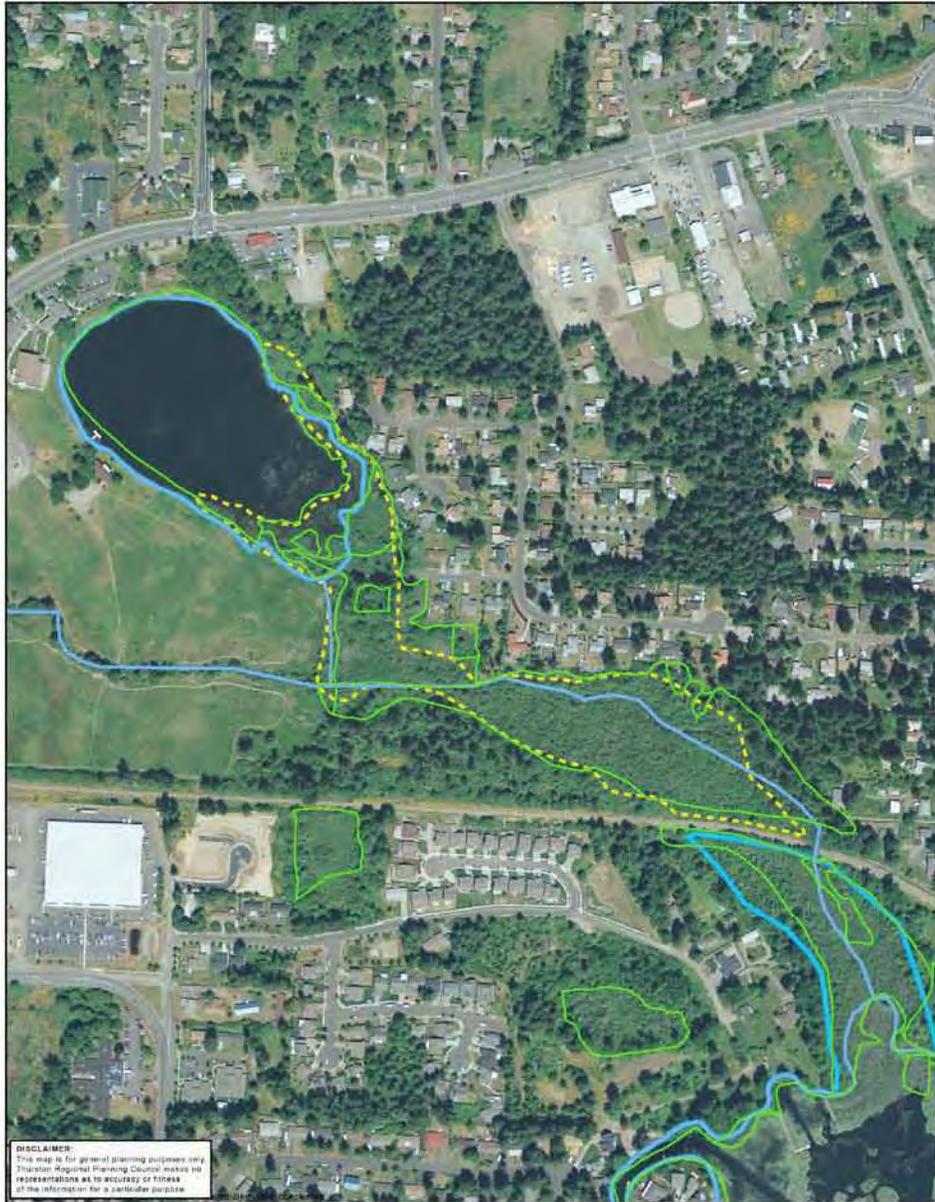
**SHORELINE MASTER PROGRAM**

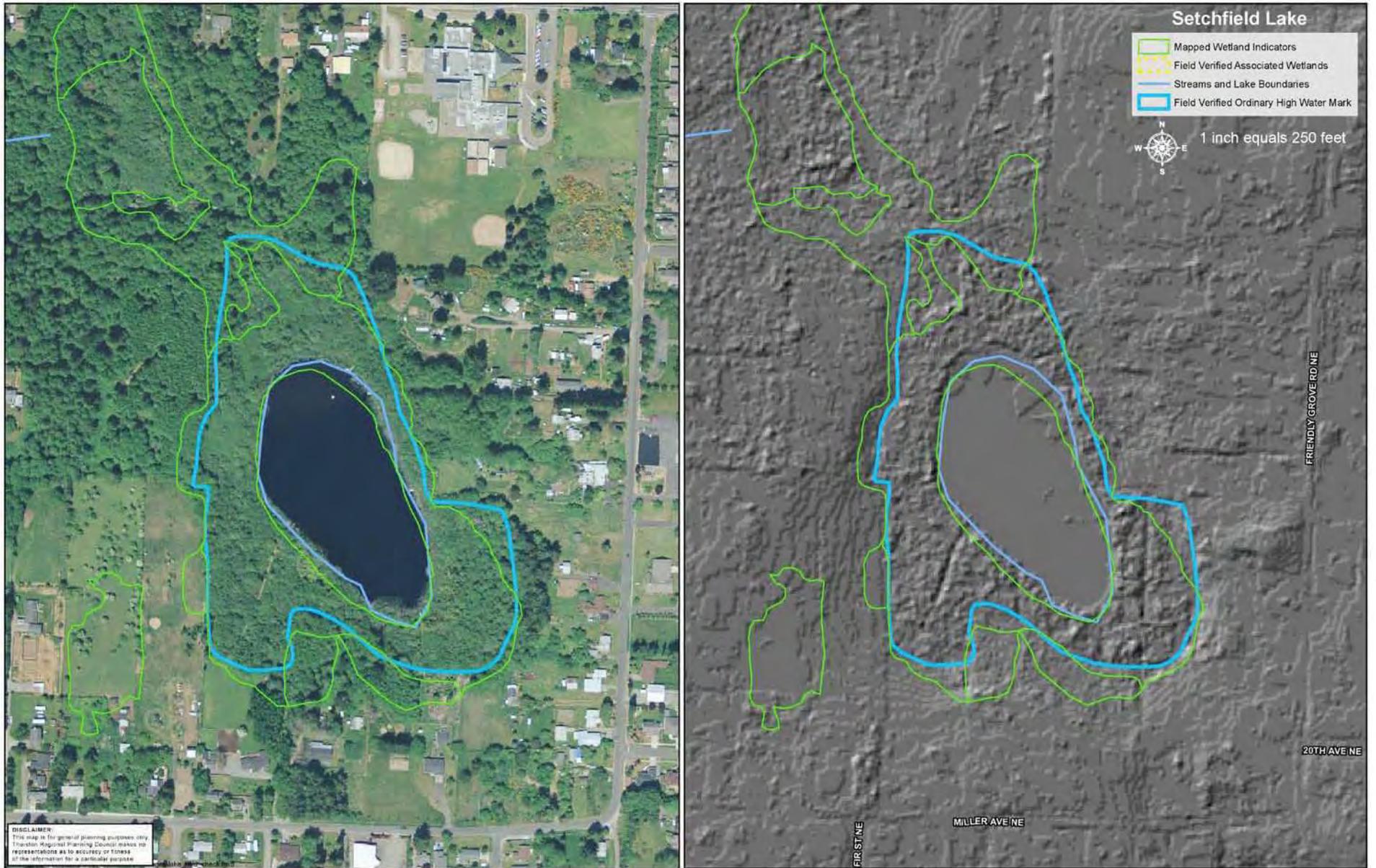


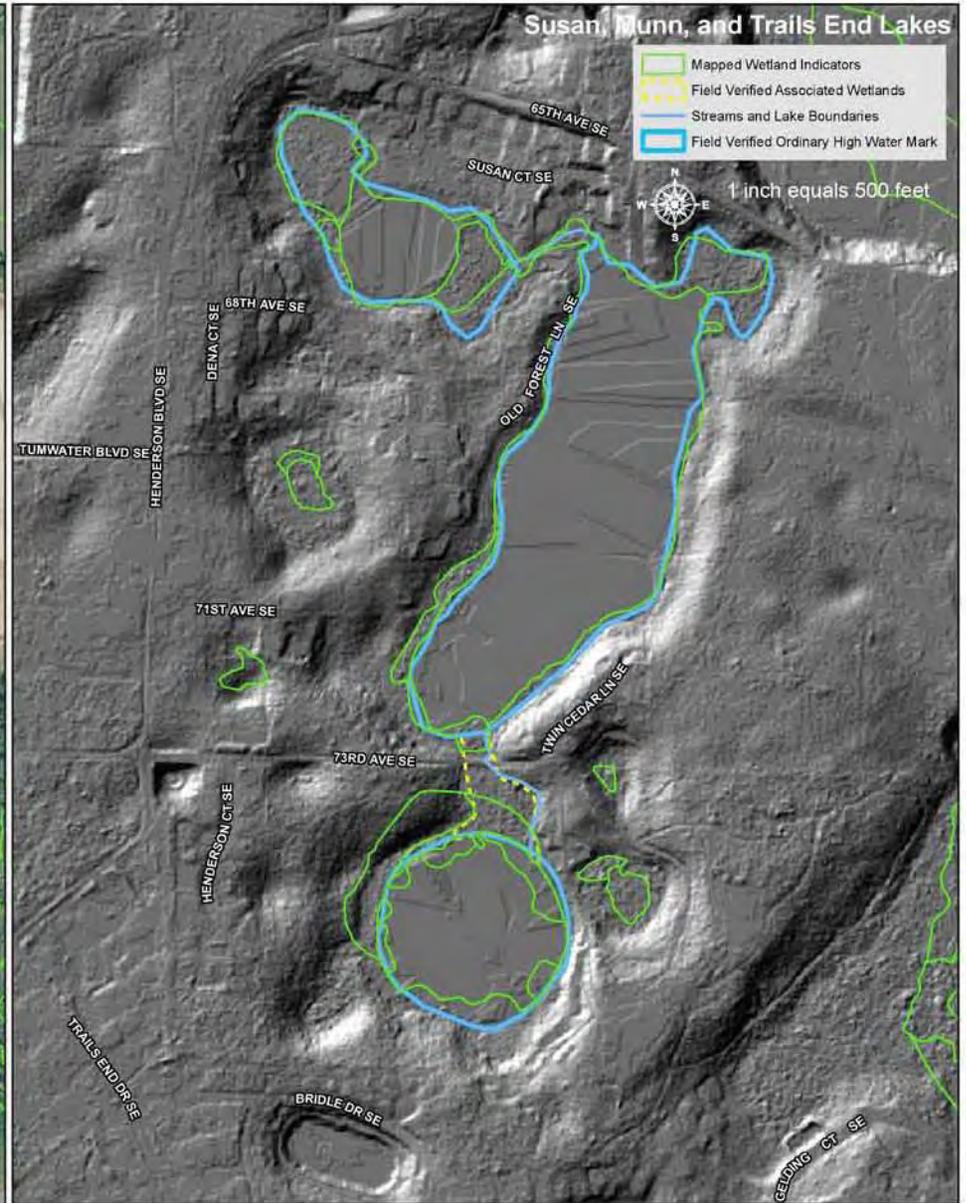


**DISCLAIMER:**  
 This map is for general planning purposes only. The State Regional Planning Council makes no representations as to accuracy or fitness of the information for a particular purpose.









## **V. Grass Lake - Ordinary High Water Mark**

The following are several memos from 1992 and 1997 documenting the field delineation of the OHWM for Grass Lake in Olympia.



**THURSTON REGIONAL PLANNING COUNCIL**

2404 B HERITAGE COURT SW OLYMPIA, WASHINGTON 98502-6031

*LINDY WILSON*  
→ Steve Friddle  
FY Files

November 18, 1992

NOV 18 1992  
OLYMPIA  
PUBLIC UTILITIES DEPT

**Members:**

- City of Lacey
- City of Olympia
- City of Tenino
- City of Tumwater
- City of Yelm
- Town of Buxton
- Town of Rainier
- Thurston County
- Intercity Transit
- Port of Olympia
- Griffin School District
- North Thurston School District
- Olympia School District
- Tumwater School District
- The Evergreen State College
- State Capitol Committee

**Tom Youell**  
110 - 110th Avenue NE, Suite 445  
Bellevue, WA 98004

Dear Tom:

In September City and County staff met with you and your representatives to discuss wetlands and shorelands issues that affected your property. We decided to pursue additional meetings between staff and the Department of Ecology (DOE) to try to resolve outstanding questions. Those meetings were held and the results are summarized for you below.

**SHORELANDS MEETING**

**Participants:** Harold Robertson, TRPC  
Linda Donaldson, TRPC  
Tom Mark, DOE  
Roger Giebelhaus, TRPC

The topic was whether or not the eastern and northwestern wetlands on your property were actually part of Grass Lake itself or associated wetlands. City staff had surveyed a number of road and culvert elevations and culvert invert elevations<sup>1</sup> that were related to the wetlands on your property (see attached map). These data were presented to Tom Mark. The data suggested that the double culvert under the sewer easement in Grass Lake Park was the highest elevation point in the surveyed system. They also suggested that the eastern wetland drained to the south but that the northwestern wetland lobe was within the lake's ordinary high water mark. Furthermore, the culverts

**Harold Robertson, AICP**  
Executive Director

(206) 786-5480

FAX 754-4413



<sup>1</sup> The elevation of the bottom of the culvert.

Tom Youell  
Shorelands and Wetlands Meetings  
Page 2

under Mud Bay Road and the sewer easement road had been cleaned out which would affect water flows in the area. Tom reviewed this information with other DOE staff and responded with the attached letter.

**WETLANDS BUFFER MEETING**

Participants:           Linda Donaldson, TRPC                               Matt Mathes, RCA  
                              Dave Hanna, Olympia                               Andy McMillan, DOE  
                              Terry Meyer, Olympia                              Peggy Clifford, DOE  
                              Paula Ehlers, TRPC  
                              Doreen Milward, Owens, Davies, Mackie

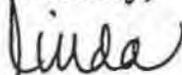
Discussion revolved around whether there were other techniques or mechanisms that could be used to protect wetlands other than a 200 foot buffer as required by the Olympia Critical Areas Ordinance. DOE staff pointed out that there was no additional flexibility available for the required wetlands buffers outside of those provided in the ordinance. No additional techniques were known to them at this time. The ordinance conditionally allows up to a 25% reduction in buffer width. DOE suggested the following information would be needed to determine if the buffer size could be reduced:

- Confirm the wetlands boundaries;
- Characterize and map the plant communities within 200 feet of the wetland boundaries; and
- Determine the wildlife use of the wetland areas.

These points are detailed in the attached letter from Andy McMillan.

We have since had additional discussions with DOE managers and staff regarding our desire to further explore whether there is a technically sound basis for allowing more flexibility based on performance criteria. DOE agreed to join us in working with you on a "prototype" project along those lines. We will share that further information with you at our Monday meeting.

Sincerely,



Linda M. Donaldson  
Associate Planner

**Tom Youell  
Shorelands and Wetlands Meetings  
Page 3**

49:lb

**Attachments:**

**Letter: October 20, 1992, From Thomas Mark to Linda Donaldson  
regarding shorelands jurisdiction**

**Letter: October 1, 1992, From Andy McMillan to Linda Donaldson  
regarding wetlands buffers**

**Map: Elevations and Invert Elevations of Culverts**

**cc: Harold Robertson  
Pete Swensson  
Matt Mathes  
Sandie Mackie  
Tom Mark  
Roger Giebelhaus**

**Dave Hanna  
Paula Ehlers  
Cindy Wilson  
Andy McMillan  
Peggy Clifford**



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

RECEIVED

OCT 22 1992

REGIONAL  
PLANNING COUNCIL

October 20, 1992

Ms. Linda Donaldson  
Thurston County Regional Planning  
2000 Lakeridge Drive Southwest  
Olympia, WA 98502

Dear Ms. Donaldson:

Re: Youell Property on Grass Lake

Based on the new information you have provided concerning the location and elevations of culverts beneath Mud Bay Road and the utility service road that lies just north of the Youell property, we have concluded that as long as these culverts are operational, it is probable that the area labeled wetland area #1 in our letter of September 16 no longer falls within the ordinary high water mark of Grass Lake.

The primary basis for this conclusion is the difference in elevation between the two twelve-inch diameter culverts under the service road and the thirty-six inch diameter culvert beneath Mud Bay Road. The elevation of the service road culverts is higher than that of the one under Mud Bay Road. It is very likely that opening these culverts will lower the water level in area #1 to the point that it can no longer be considered contiguous with the rest of Grass Lake. The area remains an associated wetland of the lake even if it is no longer within the ordinary high water mark.

This conclusion is provisional. Opening the culverts has changed the conditions under which the Department's previous ordinary high water mark determinations were made. We will be gathering new information this winter to determine whether or not field conditions support our analysis. We will let you know when our staff plans to be on site and will provide you with the results of their observations.

If you have any questions, please call me at 459-6764.

Sincerely,

Thomas Mark, A.I.C.P.  
Management Section Supervisor  
Shorelands and Coastal Zone  
Management Program

TM:JS:dh

A-64 Final Proposed Shoreline Inventory for Lacey, Olympia, Tumwater and their Urban Growth Areas  
cc: Mary Ann Swain



Linda  
RECEIVED

OCT 7 1992

STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

PLANNING COUNCIL

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

October 1, 1992

Ms. Linda Donaldson  
Thurston Regional Planning  
2404 B Heritage Court SW  
Olympia, WA 98502

Dear Ms. Donaldson:

I am writing as a follow-up to our meeting of September 24, 1992, regarding buffers around the Grass Lake wetlands. I appreciated the opportunity to provide assistance to the City of Olympia on this matter. In order for the City to make informed decisions on the appropriate buffer widths (i.e. buffer enhancement, reductions and buffer averaging) for the wetland areas on the Youell property, I believe several pieces of information are needed.

- 1) The wetland boundaries on the Youell property need to be confirmed. I recommend that the wetland boundary be flagged by a qualified wetland consultant, field verified by the Department of Ecology wetlands staff, and surveyed. It would be best to perform all three of these tasks as close together as possible to reduce the potential for flagging being removed.
- 2) The areas within 200 feet of the wetland edge should be characterized by plant communities and mapped. This should include information on dominant plant species and species densities.
- 3) The wildlife use of the wetland areas also needs to be determined. I recommend as a first step compiling existing information that has been previously prepared as part of the original Grass Lake Environmental Impact Statement or any other documentation on wildlife use of Grass Lake. The Department of Ecology wetlands staff will be glad to work with Department of Wildlife staff to review this information and make recommendations as to its adequacy and whether any further studies are needed.

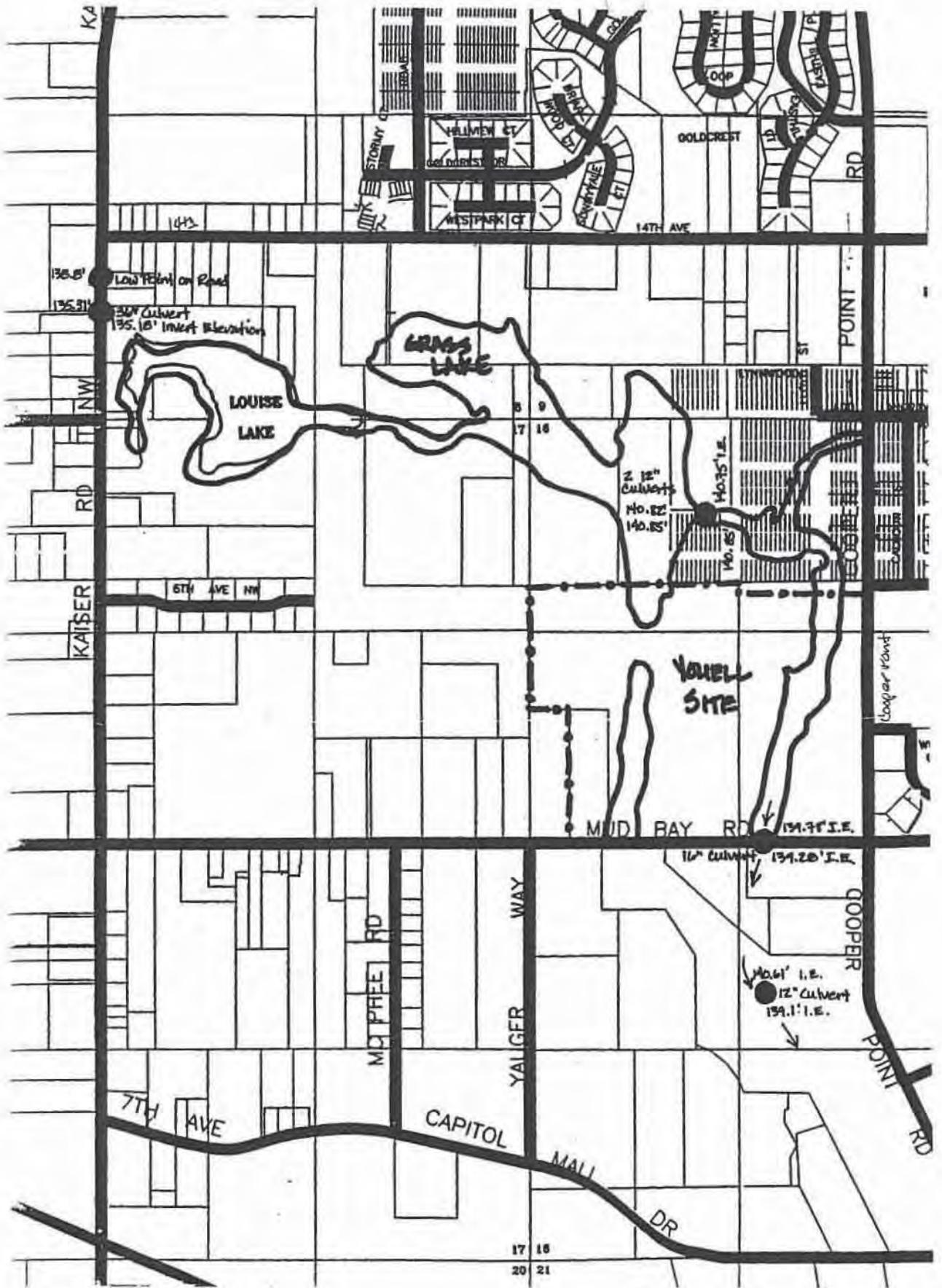
Once these steps have been completed we will be happy to work with city staff to revisit the issue of what constitutes adequate buffers on this site. If you have any questions or comments please call Bill Leonard at (206) 438-7161. Bill will be the lead contact on this project for the Department of Ecology.

Sincerely,

Andy McMillan  
Technical Unit Supervisor  
Wetlands Section  
Shorelands and Coastal Zone  
Management Program

AM:dg  
DG-L1-18

cc: Bill Leonard, Department of Ecology  
Matthew S. Mathes, Richard Carothers Associates



ENGINEERING MAP - NOT OFFICIAL  
9/21/92





STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 19, 1997

Mr. Todd Stamm  
City of Olympia  
Community Planning and Development  
P.O. Box 1967  
Olympia, WA 98507-1967

RECEIVED

MAR 24 1997

COMMUNITY PLANNING &  
DEVELOPMENT DEPT.

Dear Mr. Stamm:

This letter is a response to your request of the Department of Ecology (Ecology) to reevaluate a portion of Grass Lake as to its jurisdictional status under the state Shoreline Management Act (SMA). Specifically, you asked Ecology to review an SMA determination made in 1989 and 1992 regarding the ordinary high water mark (OHWM) of Grass Lake and its relation to that portion of the Lake which extends south to Mud Bay Road, along Cooper Point Road.

Ecology staff have made careful observations of Grass Lake regarding the OHWM since 1986. In 1989, Ecology determined that the Grass Lake system was greater than 20 acres and, therefore, a "shoreline of the state." In 1991, further field work was done specifically looking at the area in question. Based on the presence of standing water, changes in the vegetation community, and the mapped hydric soils, it was determined that this wetland area was within the OHWM of Grass Lake. Based on a review of these earlier determinations and an extensive analysis of existing conditions, it is my opinion also that this portion of Grass Lake still falls within its OHWM. The OHWM of Grass Lake extends to the south at least as far as Mud Bay Road.

The OHWM is defined in the SMA as:

"that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department..." (emphasis added)

I made numerous visits to the site from January through March, 1997 to evaluate the presence, extent, and depth of water. Several other people accompanied me on these visits including yourself, the applicant's representatives, Rich Medved and Andy Castelle; and several other Ecology staff, Kim Van Zwalenburg (Shorelands specialist), Andy McMillan (wetlands ecologist), Bill Leonard (wetlands ecologist), and Al Wald (hydrogeologist). In making this evaluation, I worked closely with Andy McMillan, Al Wald, Bill Leonard, and Mary Burg all of whom have extensive experience with this site.

We monitored the water level closely through the season using staff gauges located at Mud Bay Road and at the culverts under the sewer access road northwest of the site. Based on observations of water levels at the staff gauge at Mud Bay Road, the water depths ranged from a low of a little under two feet on January 14, 1997 to a high of slightly over three feet on January 19 and 21. From January 22 to March 11, the water level had fluctuated around two feet, nine inches. The water level in Grass Lake showed fluctuations as much as 6 inches (up and down) in 48 hours.

Todd Stamm  
March 19, 1997  
Page 2

On every visit I made, there was continuous standing water extending throughout the site. These observations are consistent with those made by Mary Burg and Al Wald from 1986 to 1989 and by Bill Leonard in 1991. They are also similar to records kept by the City of Olympia (Andy Haub) from November, 1995 through March, 1996, also from the staff gauges. While it is true that 1997 has begun as a very wet year, my observations show that the present conditions at Grass Lake are the result of a long-term trend, which includes several drier than normal years since 1980, and not simply the effect of one or two wet seasons.

At the observed water levels (2.2 - 2.9 feet), the area of standing water closely coincided with the observed vegetation communities. In the areas of standing water, the vegetation consisted of an overstory of Oregon ash, willow sp., black cottonwood, and quaking aspen. The shrubs consisted of willow sp., Pacific ninebark, and Douglas spirea. I also noted slough sedge throughout the area; however, most herbaceous vegetation is not observable at the time of year we were out there. On the adjacent uplands, the vegetation is predominately a Douglas-fir/salal community. In many places around the perimeter of the site, the change in vegetation community type from wetland to upland was quite abrupt and, again, was generally associated with the presence or absence of standing water. This dramatic change from one mature vegetation community to another is an indication of the long-term influence of water, and would not be expected to occur without frequent and prolonged inundation.

The soils on the site are mapped as McKenna gravely silt loam, a hydric soil (SCS Soil Survey of Thurston County, Washington, 1990). Surrounding the site, the soils are mapped as Alderwood gravely sandy loam, a nonhydric soil. The soil survey indicates that there may be inclusions of Alderwood and other soils within the McKenna series. This seems consistent with the soil characteristics found on site (e.g., plot #5, Adolfson Delineation, September, 1996). Based on the prolonged period of inundation, these otherwise nonhydric inclusions would be considered hydric based on the Natural Resource Conservation Service (NRCS) criteria.

To summarize, the findings from my recent investigations are consistent with the previous work done on this site and throughout Grass Lake. The area in question falls within the Ordinary High Water Mark of Grass Lake. This determination does create some inconsistencies with the Adolfson delineation, specifically regarding the presence of a upland break in the wetland at the northern end of this site.

Please let me know if you have any questions about this determination or would like additional about this site (407-7260). I would also be willing to assist you in further evaluating the delineation or other site review work which may be necessary.

Sincerely,



Perry J. Lund  
Wetlands/Shorelands Specialist  
Shorelands and Water  
Resources Program

PL:cl

cc: Rich Medved, CP Associates  
Kim Van Zwalenburg, Ecology  
Mitchell Johnson, Safeway Inc.

Susan Raults, P.W.  
Wally Trace, Video Update  
Pete Freeman, Jeff Adolfson

## VI. Annotated Bibliography

Sources were cited in the best manner possible; not all information was available for every document. Many of the documents without URL links are hard copies that are located in-house at Thurston Regional Planning Council. Any Department of Ecology documents without links can be accessed at their website, [www.ecy.wa.gov](http://www.ecy.wa.gov). Many TRPC documents are available at our website, [www.trpc.org](http://www.trpc.org).

**Aaland, N. 1990. Shoreline Master Program for the Thurston Region. Thurston Regional Planning Council, Olympia, WA.**

- Current Shoreline Master Program for the cities of Lacey, Olympia, Tumwater and unincorporated with Thurston County.

**Aaland, N. 1987. Wetland and Stream Corridors – Phase II. Thurston Regional Planning Council, Olympia, WA.**

- Continuation of policy document regarding the adoption of stream and wetland regulations for the cities of Lacey, Olympia, Tumwater and unincorporated with Thurston County.
- Has been replaced by local critical area ordinances.

**Aaland, N. 1986. Wetland and Stream Corridors – Phase I. Thurston Regional Planning Council, Olympia, WA.**

- Policy document regarding the adoption of stream and wetland regulations for the cities of Lacey, Olympia, Tumwater and unincorporated with Thurston County.
- Evaluated stream and wetland mapping abilities.

**Anchors Environmental, LLC. 2008. Final Deschutes River Watershed Recovery Plan: Effects of Watershed Habitat Conditions on Coho Salmon Production.**

- Model simulations of future Coho runs in the Deschutes River, based on various habitat recovery options.

**Andrews, S. et al. 2003. Natural Hazards Mitigation Plan for the Thurston Region. Thurston Regional Planning Council for Thurston County Emergency Management Council. Olympia, WA.**

- Is the adopted Natural Hazard Mitigation Plan for fifteen local and state governmental entities.
- Includes the cities of Lacey, Olympia, Tumwater and unincorporated with Thurston County.
- Each entity provides a list of “Mitigation Initiatives” (recommendations) that they will seek to implement by *Hazard* (earthquake, flood, landslide, storm and multiple)

and by *Category* (public information, plan coordination and implementation, data collection and mapping, development regulations, hazard preparedness, hazard damage reduction, and critical facilities replacement and retrofit).

**Bahls, P., C. Kindberg, M. Wait & J. Glasgow. 2006. Error in State Shoreline Designation for Lakes of Washington. Northwest Watershed Institute and Washington Trout, Port Townsend, WA.**

- Documents possible errors associated with the delineation of ordinary high watermark (OHWM) for lakes under the State Shoreline Management Act.
- Suggests ways of reducing errors to OHWM
- The report recommends each jurisdiction review its lakes to update those waterbodies that qualify for Shoreline designation.

**Benson, B., E. Gower, L. Cowan, G. Johnson & J. Lenzi. 1996. Thurston County Barrier Culvert Inventory. WA Department of Fish and Wildlife, Olympia, WA.**

- Baseline inventory of publicly owned culverts within Thurston County.
- Provides an evaluation of probable fish passage and priority for those with the highest degree of blockage.
- The report by SPSSEG is now likely more comprehensive.

**Brennen, J. & H. Culverwell. 2005. Marine Riparian: An Assessment of Riparian Functions in Marine Ecosystems. Washington Sea Grant Program, Seattle, WA.**

- Assessment of values and the known riparian functions along Puget Sound.
- Referenced by the Olympia critical area ordinance update in 2006.

**Bonneville Power Administration, Fort Lewis Military Reservation, Nisqually Indian Tribe, Bureau of Indian Affairs. 2004. Nisqually Transmission Line Relocation Project-Preliminary Environmental Assessment. Web URL: [http://www.efw.bpa.gov/environmental\\_services/Document\\_Library/Nisqually/PEA1485web.pdf](http://www.efw.bpa.gov/environmental_services/Document_Library/Nisqually/PEA1485web.pdf). Accessed online 9 January 2008.**

- Lists species of concern (both state and federal) that are found in Thurston County.

**Carrasquero-Verde, J., T. Abbe, G. Ward, W. Trial Jr., S. Tonkin & D. McCormack. 2005. Marine Shoreline Sediment Survey and Assessment – Thurston County, Washington. Herrera Environmental Consultants, Inc. Seattle, WA.**

- Baseline report along the Puget Sound shoreline of Thurston County, which includes the City of Olympia and Lacey marine shorelines.
- Marine bulkheads in Olympia were included into the county GIS data layer
- Filed reconnaissance of 36 pairs of armored and unarmored beach samples

- Contains maps which document forage fish habitat and utilization, the extent of shoreline armoring (as of 2003).
- Maps shoreline reaches as to those which need to be restored or preserved based upon forage fish habitat and geomorphic conditions.

**Cascade Economics LLC; Northern Economics, Inc., and Spatial Informatics Group LLC. 2007. Deschutes Estuary Feasibility Study: Net Social and Economic Benefit Analysis. Washougal, WA.**

- Part of the Deschutes Estuary Feasibility Study – CLAMP Management Objective #2.
- Provided an evaluation of social and economic benefits for the estuary study.
- Utilized community values input from the WDFW (2006) Stakeholder Report.
- Describe benefits as qualitative change from the existing lake baseline.
- Applies to Capitol Lake and Budd Inlet.

**Castro, J.M. & P.L. Jackson. 2001. Bankfull discharge recurrence intervals and regional hydraulic geometry relationships: patterns in the Pacific Northwest, USA. *Journal of the American Water Resources Association*. 37(5): 1249-1262.**

- Relates regional characteristics of Pacific Northwestern ecoregions to bankfull discharge events in streams.

**Cederholm, C. J., D.H. Johnson, R.E. Bilby, L.G. Dominguez, A.M. Garrett, W.H. Graeber, E.L. Greda, M.D. Kunze, B.G. Marcot, J.F. Palmisano, R.W. Plotnikoff, W.G. Percy, C.A. Simenstad & P.C. Trotter. 2000. Pacific Salmon and Wildlife-Ecological Contexts, Relationships, and Implications for Management. WA Department of Fish and Wildlife, Olympia, WA.**

- Baseline report on the ecological relationship of salmon to other species.
- Contains an annotated bibliography of these ecological relationships..
- Referenced by the Olympia critical area ordinance update (2004 & 2006).

**City of Bellingham, WA. 2004. Inventory and Characterization Report for Shoreline Master Program Update.**

- Like the new Jefferson County Shoreline Master Program (see ESA Adolfson, et al. 2007), the Inventory and Characterization Report for Bellingham’s SMP update provides a useful format that could be adopted for use for Thurston County’s SMP.

**City of Olympia, WA. 2007. Chambers Basin Moratorium Evaluation Report.**

**Web URL:**

**[http://www.ci.olympia.wa.us/newsfags/newsletters\\_and\\_reports/chamberslake.htm#Draft%20Chambers](http://www.ci.olympia.wa.us/newsfags/newsletters_and_reports/chamberslake.htm#Draft%20Chambers). Accessed online 9 January 2008.**

- Study of development options for the Chambers Basin area.
- Includes recommendations for management.
- Gives a background of the area and land use, discusses challenges to development.

**City of Olympia, WA. 2006. Percival Landing Concept Plan.**

- Discusses proposed improvements and alterations to Percival Landing area.
- Includes plans for habitat enhancement and sustainable environmental design.

**City of Olympia, WA. 2002. Low-Impact Development Strategy for Green Cove Basin: A Case Study in Regulatory Protection of Aquatic Habitat in Urbanizing Watersheds. Web URL:**

[http://www.psat.wa.gov/Programs/LID/Green\\_Cove.pdf](http://www.psat.wa.gov/Programs/LID/Green_Cove.pdf).

Accessed online 9 January 2008.

- Discusses low impact development plans for Green Cove Basin.

**City of Olympia, WA. 2002. Olympia's Parks, Arts & Recreation Plan.**

- Plan for management of Olympia's parks, arts and recreation facilities.
- Has some information about waterfront access in Olympia.

**City of Olympia, WA. 1999. Olympia Woodland Trail Master Plan.**

- Trail master plan
- Western terminus is in the south basin of Capitol Lake

**City of Olympia, WA. 1997. Grass Lake Refuge Final Master Plan.**

- Master plan for Grass Lake Refuge.
- Describes Grass Lake area, including hydrology, habitats, topography, etc.

**City of Olympia, WA, and Thurston County Public Works Departments. 1993. Indian/Moxlie Creek Comprehensive Drainage Basin Plan. Web URL:**

[http://www.co.thurston.wa.us/wwm/basin%20planning/Indian\\_Moxlie/indian\\_moxlie\\_basinplan.htm](http://www.co.thurston.wa.us/wwm/basin%20planning/Indian_Moxlie/indian_moxlie_basinplan.htm). Accessed online 16 January 2008.

**City of Olympia, WA, Public Works Department, City of Tumwater, WA, Thurston County, WA. 1993. Percival Creek Comprehensive Drainage Basin Plan. Web URL:**

[http://www.co.thurston.wa.us/wwm/basin%20planning/Percival%20Creek/Percival\\_Creek\\_Plan.htm](http://www.co.thurston.wa.us/wwm/basin%20planning/Percival%20Creek/Percival_Creek_Plan.htm). Accessed online 16 January 2008.

**City of Tumwater, WA. 2007. Tumwater, Washington Park Recreation & Open Space Plan (Draft).**

- Describes choices that are available for managing Tumwater's parks, recreation and open areas.

- Lists attributes of existing recreational facilities (including shoreline uses), contains aerial maps of parks, conservancies, water access, etc.

**City of Tumwater. 2007. Barnes Lake Management District—Integrated Aquatic Vegetation Management Plan. Web URL: <http://www.ci.tumwater.wa.us/BLMD/BLMD%20Aquatic%20Veg%20Mgmt%20Plan.pdf>. Accessed online 19 February 2008.**

**Collins, B. 1994. Channel Erosion along the Deschutes River. Seattle, WA.**

- Baseline report on sediment supply for the Deschutes River.
- Evaluated the sediment supply and erosion conditions from Tumwater Falls to Deschutes Falls by reaches.
- The geography includes Tumwater its urban growth area.

**Coots, R. 2005. Investigation of Petroleum Products in Black Lake Sediment and Surface Water Adjacent to an Underground Storage Tank Site. Washington State Department of Ecology. Publication No. #05-03-030. Olympia, WA. Web URL: <http://www.ecy.wa.gov/pubs/0503030.pdf>. Accessed online 28 January 2008.**

- Investigation of whether petroleum pollution has reached Black Lake from an adjacent grocery store.
- Results indicate that at this time, the pollution has not reached Black Lake.
- PAHs detected, but have other sources (i.e. combustion).

**Craig, D & C. Wells. 1994. Impervious Surface Reduction Study – Technical and Policy Analysis Final Report. City of Olympia Pubic Works Department, Olympia, WA.**

**Cramer, T & K. Bates. 2003. Integrated Streambank Protection Guidelines. WA Departments of Ecology, Fish and Wildlife, and Transportation and the U.S. Army Corps of Engineers. Olympia, WA.**

- State guidance for construction within or along riparian areas.
- Default standard for riparian areas in the City of Olympia critical area ordinance update 2006.

**Cramer, D.D. 1993. A River Runs Through It: An Analysis of Alternatives for Reducing Flooding and Erosion Hazards for the Cougar Mountain Camp Residential Community. Deschutes River Basin, Thurston County, WA.**

**Davis, S., M. Turner & H. Saunders. 1993. Budd Inlet – Deschutes River Watershed Characterization: Part I Watershed Characterization. Thurston County Environmental Health Department and Thurston Regional Planning Council. Olympia, WA.**

- Background data report a non-point pollution watershed action plan.
- Describes watershed conditions within the Deschutes Watershed and Budd Inlet.
- Includes water quality and land use description of these areas for the late 1980s and early 1990s.
- Geography includes Thurston County and the cities of Lacey, Olympia, and Tumwater and their urban growth areas.

**Drost, B.W., G.L. Turney, N.P. Dion, and M.A. Jones. 1998. Hydrology and quality of ground water in northern Thurston County, Washington. U.S. Geological Survey, in cooperation with Thurston County Health Department.**

**ENTRANCO. 2000. Capitol Lake Adaptive Management Plan – Phase One - Task 11 Sediment Management: Answers to Technical Questions. Bellevue, WA.**

- Report to provide more detail on sediment than was provided by the CLAMP EIS.
- Provided pros and cons to a variety of dredging techniques, on-shore handling techniques, and disposal techniques.
- Provided a recommended protocol and a preliminary cost estimate per unit of volume.
- Applies only to Capitol Lake.

**ENTRANCO. 1998. Draft Environmental Impact Statement - Capitol Lake Adaptive Management Plan. Bellevue, WA.**

- Draft EIS of six scenarios for managing Capitol Lake.
- Included four lake alternatives, two estuary alternatives, and a no action alternative.
- Applies only to Capitol Lake.

**ENTRANCO. 1997. Technical Memorandum – 1991 to 1996 Capitol Lake Survey – Sediment Volume Calculations. Bellevue, WA.**

- Technical Memorandum to GA regarding the sediment assumption used in the CLAMP DEIS.
- Applies only to Capitol Lake.

**ENTRANCO. 1996. Draft Environmental Impact Statement - Capitol Lake Restoration and Recreation Plan: Revised Maintenance Sediment Removal Plan. Bellevue, WA.**

- Draft EIS for dredging the Middle Basin of Capitol Lake.
- No Final EIS was prepared.
- Applies only to Capitol Lake.

**ESA Adolfson, et al. 2007. Final Shoreline Inventory and Characterization Report of the Jefferson County Shoreline Master Program Update Project. Web URL: [http://www.co.jefferson.wa.us/commdevelopment/ShorelineInventory.htm#2005\\_Inventory\\_Maps](http://www.co.jefferson.wa.us/commdevelopment/ShorelineInventory.htm#2005_Inventory_Maps).**

- Example of Shoreline Inventory and Characterization Report for Jefferson County
- Contains several useful sources and restoration examples that may apply to southern Puget Sound.

**Federal Emergency Management Agency. 1984. Flood Insurance Study – City of Tumwater, Washington - Thurston County. Washington, D.C.**

**Federal Emergency Management Agency. 1982a. Flood Insurance Study – City of Olympia, Washington - Thurston County. Washington, D.C.**

**Federal Emergency Management Agency. 1982b. Flood Insurance Study – Unincorporated Thurston County, Washington. Washington, D.C.**

**Federal Emergency Management Agency. 1980. Flood Insurance Study – City of Lacey, Washington - Thurston County. Washington, D.C.**

**FishPro, Inc. Master Plan for the Deschutes Watershed Center. Washington State Department of Fish and Wildlife & City of Tumwater. Olympia, WA.**

- Master plan for a fish hatchery at Pioneer Park in Tumwater
- Located along the Deschutes River

**Garono, R., Thompson, E., Koehler, M. 2006. Deschutes River Estuary Restoration Study Biological Conditions Report. Earth Design Consultants, Inc. Corvallis, OR**

- Part of the Deschutes Estuary Feasibility Study – CLAMP Management Objective #2.
- Evaluated five estuaries within Southern Puget Sound to determine the range of reference values for Capitol Lake.
- Samples collected from 90 sites within the five reference estuaries.
- Principle Component Analysis found little correlation between sampling sites.
- Utilized the future lake basin bathymetry and salinity values suggested by George, et. al. (2006).
- Suggested what the future estuarine conditions would be like in Capitol Lake.
- Applies to Capitol Lake and Budd Inlet.

**Garono, R., Thompson, E., Koehler, M. 2007. Addendum to the Deschutes River Estuary Restoration Study Biological Conditions Report. Earth Design Consultants, Inc. Corvallis, OR**

- Part of the Deschutes Estuary Feasibility Study – CLAMP Management Objective #2.

- Added analysis of reference estuary soil conditions.
- Additional data did not provide any better fit using Principle Component Analysis
- Applies to Capitol Lake and Budd Inlet.

**Geoengineers, Inc. 2000. Report: Hydrogeologic Assessment: Proposed Smith Lake Village Residential Development, Thurston County, WA.**

- Report discusses the impacts of the proposed Smith Lake Village Development.
- No substantial impacts to groundwater were found.
- Gives general site overview.

**George, D., Gelfenbaum, G., Lesser, G., and Stevens, A. 2006. Deschutes Estuary Feasibility Study - Hydrodynamics and Sediment Transport Modeling. (Open File Report 2006-1318) U.S. Department of the Interior - U.S. Geological Survey. Menlo Park, CA.**

- Part of the Deschutes Estuary Feasibility Study – CLAMP Management Objective #2.
- Undertook detailed sediment modeling for the Capitol Lake basin.
- Evaluated four estuary scenarios for the basin using the calibrated model.
- Documented what changes has happened to the volume of water and its depth since the construction of the Capitol Lake dam.
- Provided a highly accurate bathymetry of lake and lower Budd Inlet for 2004.
- Provided estimated ranges of sediment mobilization over time and within the lake and in southern Budd Inlet.
- Applies to Capitol Lake and Budd Inlet.

**Gilbert, H. & V. Tabbutt. 2000. Regional Benchmarks for Thurston County. Thurston Regional Planning Council. Olympia, WA.**

**Granger, T., T. Hruby, A. McMillan, D. Peters, J. Rubey, D. Sheldon, S. Stanley & E. Stockdale. 2005. Wetlands in Washington State – Volume 2: Guidance for Protecting and Managing Wetlands. WA Department of Ecology, Olympia, WA.**

- Volume 2 or 2 of state guidance for wetland regulations for Western Washington
- Referenced and utilized by the cities of Lacey, Olympia, and Tumwater when their critical area ordinances were updated

**Hamann, R. & J. Wade. 1990. Ordinary High Water Line Determination: Legal Issues; Section IV: Procedures for Establishing OHWL. *Florida Law Review*. 42(2): 389-397.**

- Discusses various cases where OHWL has been disputed in Florida.
- Provides general guidelines on determining OHWL when litigation is likely.

**Harrington, D. & J. Knovsky. 1999. Salmon Habitat Limiting Factors Final Report – Water Resource Inventory Area 13. Thurston Conservation District Lead Entity, Olympia, WA.**

- Baseline assessment of those factors which would limit salmon habitat within the Deschutes Water Resource Inventory Area (WRIA) #13.
- The geography includes all the streams and lakes within the cities of Lacey, Olympia and Tumwater most of their urban growth area.
- Provides known characteristics of salmonid populations naturally occurring in WRIA 13.
- References section lists several key studies conducted on Shoreline waterbodies by various jurisdictions in Thurston County.

**Hatch-Winnica, A. 2006. Water Resource Inventory Area 13 Freshwater and Nearshore Implementation Priorities – 2006 to 2009. Thurston Conservation District Lead Entity, Olympia, WA.**

- Current three-year salmon recovery strategy for the Deschutes Water Resource Inventory Area (WRIA) #13.
- Contains a range of recovery strategies from culvert replacements to habitat protection through land purchases.
- Include priorities for marine and fresh water systems.
- The geography includes the cities of Lacey, Olympia and Tumwater most of their urban growth area.

**Hatch-Winnica, A. 2005. Salmon Habitat Protection and Restoration Plan for Water Resource Area 13, Deschutes. Thurston Conservation District Lead Entity, Olympia, WA.**

- Baseline summary of the Deschutes Water Resource Inventory Area (WRIA) #13 for salmon habitat.
- Includes data on those lakes, streams and marine shorelines which provide habitat for the various types of salmon.
- Relies on Harrington & Knovsky (1999) to describe the various limiting factors and suggests corrective measures.
- The geography includes the cities of Lacey, Olympia and Tumwater most of their urban growth area.

**Hatton, Steve of Hatton Godat Pantier, Inc. 2003. Letter to Thurston County Roads and Transportation Department regarding Smith Lake Village Plat.**

- Letter lists elevation of groundwater in the area of Smith Lake.
- Describes stormwater management for subdivision.

**Herrera Environmental Consultants. 2000. Capitol Lake Adaptive Management Plan – Sediment Characterization Report. Seattle, WA.**

**Herrera Environmental Consultants. 2000. Capitol Lake Adaptive Management Plan – Sediment Sampling and Analysis Plan and Quality Assurance Plan. Seattle, WA.**

- Reports to provide more detail on sediment quality than was provided by the CLAMP EIS.
- Evaluated two sediment cores taken at the Middle Basin sediment trap (just north of I-5 bridge).
- Found no sediment quality issues which would prohibit dredging at that location.
- Did not test for heavy metals or other exotic toxic or hazardous chemicals.
- Applies only to Capitol Lake.

**Hruby, T. 2004. Washington State Wetland Rating System for Western Washington – Revised. WA State Department of Ecology. Olympia, WA.**

- The WDOE guidance for rating wetlands in Western Washington.
- Reference in the adoption of local critical area ordinances for the cities of Lacey, Olympia and Tumwater.

**IES Associates. 1989. Wetland Delineation, Evaluation, and General Biological Overview: Cooper Point Grove. Olympia, WA.**

**Isley, B. 1995. New Market Historic District Master Plan. Hewitt & Isley, Seattle, WA.**

- Land Use Master Plan for the Tumwater Historic District (part of Capitol Lake).
- Provides policies for the redevelopment of the Old Brewhouse in Tumwater.

**James, C. 2007. Nisqually River Basin Fecal Coliform Bacteria and Dissolved Oxygen Total Maximum Daily Load: Water Quality Implementation Plan. Washington State Department of Ecology. Publication No. #07-10-016. Olympia, WA. Web URL: <http://www.ecy.wa.gov/pubs/0710016.pdf>. Accessed online 28 January 2008.**

- Water quality information for Nisqually Reach.
- Gives information on plans to improve water quality.

**Keany, J. and S. Rozenbaum. 1992. Thurston Regional Wetland and Stream Corridor Inventory – Final Report. Shapiro and Associates, Seattle, WA.**

- Wetland mapping for 260 square miles of Northern Thurston County.
- Mapping delineated from a variety of best available sources, including 1992 color infrared aerial photography at the scale of 1" = 1,000' and 1" = 500' in the urban growth area.
- Included a limited amount of field reconnaissance at between 5 to 10 percent of the aerial coverage.

- GIS wetland data layer and section maps created by Thurston Regional Planning Council.
- The geography includes the cities of Lacey, Olympia and Tumwater all of their urban growth area.

**Kettman, J. & S. Morrison. 1993. Inventory and Characterization of Shoreline Armoring: Thurston County, WA 1977-1993. Thurston Regional Planning Council, Olympia, WA.**

- Baseline study regarding the location of shoreline armoring (e.g. bulkheading, rip rap, etc.) along the marine shoreline of Thurston County.
- Documented permits for armoring from 1984 to 1992.
- Field reconnaissance undertaken by the American Littoral Society.
- GIS data layer created by parcel of shoreline armoring conditions.
- Geography included Thurston County shoreline, not including Budd Inlet within the City of Olympia (that was inventoried by Carrasquero-Verde et. al., 2005).

**Kliem, J. 2006. Chinook & Bull Trout Recovery Approach for the South Puget Sound Nearshore. Draft Version II. Prepared by the South Puget Sound Salmon Recovery Group.**

**Kunze, L. 1994. Preliminary Classification of Native, Low Elevation, Freshwater Wetland Vegetation In Western Washington. Natural Heritage Program, WA Department of Natural Resources. Olympia, WA.**

- Indicates those wetland of exceptional quality
- Those identified within the region included Gull Harbor on Budd Inlet.

**Knutson, K.L. & V.L. Naef. 1997. Management Recommendations for Washington's Priority Habitats: Riparian. WA Department of Fish and Wildlife, Olympia, WA.**

- Baseline report by WDFW regarding riparian habitats.
- Referenced by the cities of Lacey, Olympia, and Tumwater in their critical area ordinance updates

**Lichvar, R.W., D.C. Finnegan, M.P. Ericsson & W. Ochs. 2006. Distribution of ordinary high water mark indicators and their reliability in identifying the limits of "waters of the United States" in arid Southwestern channels. Cold Regions Research and Engineering Laboratory.**

- Discusses OHWM indicators in the Southwest, concluding that in "flashy" discharge areas, the varying discharge pattern causes random distribution of OHWM indicators.

**Logan, R.L., T.J. Walsh, H.W. Schasse, and M. Polenz. 2003. Geologic Map of the Lacey 7.5-minute Quadrangle, Thurston County, Washington. Washington**

**State Department of Natural Resources. Web URL:**  
<http://www.dnr.wa.gov/geology/pdf/ofr03-9.pdf>. Accessed online 5 February 2008.

**LOTT Alliance. 2007. State of the Utility Report. Web URL:**  
<http://www.lottonline.org/pdf/sur07.pdf>. Accessed online 9 January 2008.

- Gives a list of efforts made to improve habitat and water quality in the area.
- Also provides an updated overview of LOTT operations.

**LOTT Alliance. 2000. Budd Inlet Scientific Study: An Overview of Findings.**

- Researchers found that additional winter discharge to Budd Inlet will not cause harm.
- LOTT discharges may have little impact on shellfish harvest.
- LOTT is a much smaller contributor of nutrient to Budd Inlet than Puget Sound or Deschutes River/Capitol Lake.

**Lundgen, J. 2004. WRIA 13: Deschutes Watershed Salmon Passage Inventory. South Sound Salmon Enhancement Group, Olympia, WA.**

- Update of the year WDFW culvert inventory within Water Resource Inventory Area (WRIA) #13 – Deschutes.
- Also included culverts on private property and along the marine shoreline.
- Geography includes the cities of Lacey, Olympia, and Tumwater and their urban growth areas.

**MAKERS & Mark, T., P. Skowlund, B. Wenger & N. Jewett. 1990. Shoreline Management Guidebook. MAKERS & WA Department of Ecology, Olympia, WA.**

**Manashe, E. 1993. Vegetation Management: A Guide For Puget Sound Bluff Property Owners. WA Department of Ecology, Olympia, WA.**

**May, C.W., E.B. Welch, R.R. Horner, J.R. Karr & B.W. Mar. 1997. Quality Indices For Urbanization Effects On Puget Sound Lowland Streams. Civil Engineering Department, University of Washington, Seattle, WA.**

**McNicholas, R. 1984. Stream Corridor Management Plan for the Deschutes River. Thurston County Conservation District.**

- Delineation of erosion sites along the mainstem of the Deschutes River and Black Lake Drainage Ditch and Percival Creek

**Melvin, D.J. 2007. Washington State Department of Health-Office of Shellfish and Water Protection. Annual Growing Area Review of Eld Inlet. Web URL: <http://www.doh.wa.gov/ehp/sf/Pubs/gareports/eld.pdf>. Accessed online 9 January 2008.**

- Shellfish water quality information for Eld Inlet.

**Melvin, D.J. 2007. Washington State Department of Health-Office of Shellfish and Water Protection. Annual Growing Area Review of Henderson Inlet. Web URL: <http://www.doh.wa.gov/ehp/sf/Pubs/gareports/hendersoninlet.pdf>. Accessed online 9 January 2008.**

- Shellfish water quality information for Henderson Inlet.

**Melvin, D.J. 2007. Washington State Department of Health-Office of Shellfish and Water Protection. Annual Growing Area Review of Nisqually Reach. Web URL: <http://www.doh.wa.gov/ehp/sf/Pubs/gareports/nisqually.pdf>. Accessed online 9 January 2008.**

- Shellfish water quality information for Nisqually Reach.

**Melvin, D.J. 2007. Washington State Department of Health-Office of Shellfish and Water Protection. Annual Growing Area Review of Totten Inlet. Web URL: <http://www.doh.wa.gov/ehp/sf/Pubs/gareports/totten.pdf>. Accessed online 9 January 2008.**

- Shellfish water quality information for Totten Inlet.

**Moffat & Nichol. 2007. Deschutes Estuary Feasibility Study – Engineering Design and Cost Estimates. Seattle, WA.**

- Part of the Deschutes Estuary Feasibility Study – CLAMP Management Objective #2.
- Provided a preliminary design of for three of the four estuary alternatives.
- Provided a cost estimate for three of the four estuary alternatives.
- Utilized the future lake basin bathymetry suggested by George, et. al. (2006).
- Suggested a pre-dredge mitigation approach to lessen stored sediment impacts to lower Budd Inlet.
- Applies to Capitol Lake and Budd Inlet.

**Morrison, S. 2004. Wetland Mapping for the Thurston Region. Thurston Regional Planning Council, Olympia, WA. Web URL: <http://www.trpc.org/programs/environment/water/thurston+county+wetlands+mapping.htm>.**

- Description of the mapping wetlands within Thurston County from 1993 to 2002.
- Summarizes the sources and mapping techniques used to map 615 sq miles.

- Highlight problems and correction for false positives.
- Summarize changes in cost and resources over time.
- Geography includes the cities of Lacey, Olympia, and Tumwater and Thurston County.
- Mapping does not include long-term forestry areas and military reservations.

**Morrison, S. 1993. Thurston Regional Wetland and Stream Corridor Inventory: Phase 2 Northern Thurston County. Thurston Regional Planning Council, Olympia, WA.**

- Overview of wetland conditions found in Northern Thurston County.
- Summarizes the mapping protocol used in Keany and Rozenbaum (1992).
- Include GIS wetland section maps for 260 square miles.
- The geography includes the cities of Lacey, Olympia and Tumwater all of their urban growth area.

**Morrison, S. 1999. Thurston County Flood Hazard Management Plan. Thurston Regional Planning Council for Thurston County, Olympia, WA.**

- Comprehensive Flood Hazard Management Plan for unincorporated Thurston County, and was adopted by WDOE.
- Summarizes the historical flood events and evaluated Thurston County land use policies and land use regulations regarding flooding.
- Summaries Thurston County's proposed Capitol Facilities Plan projects within designated floodplains.
- Summarizes the meander belt mapping done on the Deschutes River.
- Establish flood plan objectives
- Contains a list of recommendations for reducing flood hazards, which was integrated into Andrews, et al. 2003.

**Morrison, S. 1991. Thurston Regional Wetland Pilot Project. Thurston Regional Planning Council. Olympia, WA.**

- Conceptual design and a small scale test of mapping wetlands using color infrared aerial photography.
- Test geography of 21 square miles in three strips, each in part of Lacey, Olympia and Tumwater.
- Established the wetland mapping protocol that was later used to map wetlands in Thurston County (Keany & Rozenbaum 1992).

**Morrison, S & T. Julius. 2001. Tracking Development on Streams and Wetlands. Thurston Regional Planning Council for Thurston County. Olympia, WA.**

- Performance evaluation of 100 constructed development project on streams and wetlands.

- Utilized a series of “Benchmarks” to evaluate land use policy, critical area ordinance permit review, and field verification of required buffers or mitigation measures.
- Report was utilized during the critical areas ordinance update for the cities of Lacey, Olympia, and Tumwater.
- Coverage includes the cities of Lacey, Olympia, and Tumwater and Thurston County.

**Morrison, S. 1999. Capitol Lake Adaptive Management Plan: 1999 – 2001. Thurston Regional Planning Council for WA Department of General Administration. Olympia, WA.**

- Interim management plan for Capitol Lake.
- Recommended for adoption by the Capitol Lake Adaptive Management Plan (CLAMP) Steering Committee.
- The CLAMP Steering Committee represents the State Departments of General Administration, Ecology, Fish and Wildlife, and Natural Resources, Squaxin Island Tribe, Cities of Olympia and Tumwater, Thurston County and the Port of Olympia.
- The geography includes the cities of Olympia and Tumwater.

**Morrison, S. 1986. Shoreline Master Program for the Thurston Region. Thurston Regional Planning Council. Olympia, WA.**

- Previous Shoreline Master Program for the cities of Lacey, Olympia, Tumwater and unincorporated with Thurston County.
- Undated by Aaland, 1990 and subsequent special management area plans.

**Morrison, S. 1985. Percival Creek Corridor Plan – Vol. 1: Canyon and Middle Reaches. Thurston Regional Planning Council. Olympia, WA.**

- Special Management Area Plan adopted as an amendment to the *Shoreline Master Program for the Thurston Region* (Morrison, 1986).
- Includes complementary local land use regulations beyond SMA jurisdiction.
- Geography covers Percival Creek in the City of Olympia and Tumwater.

**Morrison, S. 1986. Percival Creek Corridor Plan – Vol. 2: Upper Reach. Thurston Regional Planning Council. Olympia, WA.**

- Special Management Area Plan adopted as an amendment to the *Shoreline Master Program for the Thurston Region* (Morrison, 1986).
- Documentation provided for including the Black Lake Drainage Ditch as shoreline jurisdiction.
- Associated wetland along the Black Lake Drainage Ditch mapped based upon (then available) wetland science.
- Includes complementary local land use regulations beyond SMA jurisdiction.
- Geography covers Percival Creek and the Black Lake Drainage Ditch in Olympia, Tumwater and Thurston County.

**Morrison, S. 1995. Budd Inlet – Deschutes River Watershed Action Plan. Thurston Regional Planning Council. Olympia, WA.**

- Non-point pollution watershed action plan for the Deschutes Watershed and Budd Inlet.
- Contains a series of action recommendations to reduce non-point pollution within the watershed and inlet.
- Geography includes Thurston County and the cities of Lacey, Olympia, and Tumwater and their urban growth areas.

**Morrison, S. 1996. Thurston County Water Resource Profile. Thurston Regional Planning Council. Olympia, WA.**

- Background report on all types of water resources reports within Thurston County.
- Summary of water related reports by river watershed.
- Provides a methodology for rating water quality in fresh and salt water systems.
- Water quality map of Thurston County utilized all available data within the preceding five years.

**Newton, J.A., S.L. Albertson, K. Van Voorhis, C. Maloy & E. Siegel. 2002. Washington State Marine Water Quality, 1998 through 2000. Washington State Department of Ecology. Publication #02-03-056. Olympia, WA. Web URL: [www.ecy.wa.gov/biblio/0703033.html](http://www.ecy.wa.gov/biblio/0703033.html). Accessed online 7 January 2008.**

- Contains water quality information for Budd Inlet for the years 1998-2000.

**Northwest Aquatic Eco-systems. 2007. Barnes Lake Floating Plant Control 2007 Year End Report. Web URL: <http://www.ci.tumwater.wa.us/BLMD/Barnes%20LMD%20Year%20End%20Report%202007-Final.pdf>. Accessed online 19 February 2008.**

**O’Neal, R.A., et al. 1975. Shoreline Inventory for Thurston County. Thurston Regional Planning Council. Olympia, WA.**

- Original shoreline inventory for all of the Thurston Region.
- Includes description of existing conditions (assumed date 1974-75).
- Shoreline conditions mapped on large scale (1”= 2,000’) USGS quad maps.
- Provided the basis for adopting the original *Shoreline Master Program for the Thurston Region* (O’Neal, 1976).

**O’Neal, R.A., et al. 1976. Shoreline Master Program for the Thurston Region. Thurston Regional Planning Council. Olympia, WA.**

- Original *Shoreline Master Program for the Thurston Region*.
- Geography the cities of Lacey, Olympia, and Tumwater and Thurston County.

**Philip Williams & Associates, Ltd. 2007. Deschutes Estuary Feasibility Study – Independent Technical Review. San Francisco, CA.**

- Part of the Deschutes Estuary Feasibility Study – CLAMP Management Objective #2.

**Puget Sound Action Team. Web URL: [http://www.psat.wa.gov/Publications/Pub\\_Master.htm](http://www.psat.wa.gov/Publications/Pub_Master.htm). Accessed online 19 December 2007.**

- Contains reports on Puget Sound topics, including fish/shellfish, shorelines, and pollution.

**Puget Sound Action Team. 2007. 2007 Puget Sound Update: Ninth Report of the Puget Sound Assessment and Monitoring Program. Puget Sound Action Team. Olympia, WA. 260 pp. Web URL: [http://www.psat.wa.gov/Publications/update\\_07/2007\\_PS\\_Update.pdf](http://www.psat.wa.gov/Publications/update_07/2007_PS_Update.pdf). Accessed online 7 January 2008.**

- Provides water quality information for Budd Inlet and Nisqually Reach.
- Discusses species of concern and nuisance species, including aquatic vegetation.
- General information about the Puget Sound environment.

**Puget Sound Action Team, Office of the Washington State Governor & Thurston Regional Planning Council. 2006. South Puget Sound Forum—Indicators Report. Web URL: [http://www.trpc.org/resources/southpugetsoundindicatorsreport\\_july06.pdf](http://www.trpc.org/resources/southpugetsoundindicatorsreport_july06.pdf). Accessed online 9 January 2008.**

- Discusses environmental indicators and what they are communicating about the current status and recent trends of South Puget Sound.
- Includes information about population, land cover, shoreline armoring, shellfish water quality, freshwater quality and marine water quality.
- Provides future projections for some of these indicators.
- Has some land use and water quality information about Percival and Woodland Creeks.

**Raines, M. 2007. Deschutes River Mainstem Bank Erosion: 1991 to 2003. Squaxin Island Tribe and Washington State Department of Ecology. Shelton, WA.**

- Update of previous work by Collins, 1995 and McNicholas, 1984.
- Used 2002 LiDAR to remap erosion sites along the river.
- Provides an estimate of sedimentation along the Deschutes River
- Cover the timeframe of 1991 to 2003

**Rapp, C. F. & T.B. Abbe. 2003. A Framework for Delineating Channel Migration Zones. Washington State Department of Ecology and Transportation. Publication #03-06-027. Olympia, WA.**

- The WDOE guidance for delineating channel migration zones (CMZs).
- CMZ normally associated with large river systems.

**Revised Code of Washington 90.58. 1971. Shoreline Management Act of 1971.**

**Richter, J.E. 1995. East Bay Habitat Enhancement Plan. Water Resources Program, Olympia Public works Department. Olympia, WA.**

- Shoreline habitat plan proposed for the east Bay of Budd Inlet.
- Recommendation included habitat enhancements.
- Located within the City of Olympia.

**Roberts, M. & G. Pelletier. 2007. Interim Results from the Budd Inlet, Capitol Lake, and Deschutes River Dissolved Oxygen and Nutrient Study. Washington State Department of Ecology. Web URL: [http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/technical\\_reports/budd-deschutes\\_nutrstudy2007.pdf](http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/technical_reports/budd-deschutes_nutrstudy2007.pdf). Accessed online 21 December 2007.**

- Contains water quality information for the Deschutes River, Capitol Lake and Budd Inlet.
- Reference section lists other water quality studies of the South Puget Sound region.

**Roberts, M., B. Zalewsky, T. Swanson, L. Sullivan, K. Sinclair, and M. LeMoine. 2004. Quality Assurance Project Plan—Deschutes River, Capitol Lake, and Budd Inlet Temperature, Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Fine Sediment Total Maximum Daily Load Study. Washington State Department of Ecology. Publication #04-03-103. Olympia, WA. Web URL: <http://www.ecy.wa.gov/biblio/0403103.html>. Accessed online 21 December 2007.**

- Describes the technical study that will evaluate pollutants in these impaired waterbodies.
- Gives overall description of region, including land use, geology, development, etc.
- Gives some information about watershed processes and anthropogenic influences on waterbodies.
- Lists point sources of pollution in the Thurston region.

**Sargeant, D., B. Carey, M. Roberts, and S. Brock. 2006. Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Maximum Daily Load Study. Washington State Department of Ecology. Publication #06-03-012. Olympia, WA. Web URL: <http://www.ecy.wa.gov/pubs/0603012.pdf>. Accessed online 21 December 2007.**

- Contains water quality information on Woodland Creek and Henderson Inlet, also general information about these water bodies.

- Contains geologic and hydrogeologic surveys of the area, Resources section lists other studies that contain similar information.

**Sargeant, D., M. Roberts, and B. Carey. 2005. Nisqually River Basin Fecal Coliform and Dissolved Oxygen Total Maximum Daily Load Study. Washington State Department of Ecology. Publication #05-03-002. Olympia, WA. Web URL: <http://www.ecy.wa.gov/pubs/0503002.pdf>. Accessed online 21 December 2007.**

- Contains general and water quality information for the Nisqually Reach.

**Schilperoort, D. & S. Morrison. 2002. Capitol Lake Adaptive Management Plan – A Vision for the Next Ten Years: 2003-2013. Thurston Regional Planning Council & WA Department of General Administration. Olympia, WA.**

- Current management plan for Capitol Lake.
- Recommended for adoption by the Capitol Lake Adaptive Management Plan (CLAMP) Steering Committee.
- The CLAMP Steering Committee represents the State Departments of General Administration, Ecology, Fish and Wildlife, and Natural Resources, Squaxin Island Tribe, Cities of Olympia and Tumwater, Thurston County and the Port of Olympia.
- Contains 14 management objectives and suggested actions for each over the next ten years.
- Adopted by the State Capitol Committee as a part of the Washington State Capitol Campus.
- The geography includes the cities of Olympia and Tumwater.

**Science Applications International Corporation. 2007 Sediment Characterization Study Budd Inlet, WA. Washington State Department of Ecology, Olympia, WA.**

- Study of dioxins and furan in lower Budd Inlet and Capitol Lake
- Included analysis of sediment cores and biologic indicators

**Shreffler, D.K., R.M. Thom & K.B. MacDonald. 1994. Shoreline Armoring Effects on Biological Resources and Coastal Ecology in Puget Sound.**

**Sheldon, D., T. Hruby, P. Johnson, K. Harper, A. McMillian, T. Granger, S. Stanley & E. Stockdale. 2005. Final Freshwater Wetlands in Washington State – Volume 1: A Synthesis of Science. WA Department of Ecology. Olympia, WA.**

- Volume 1 or 2 of state guidance for wetland regulations for Western Washington.
- Summarized the known values and functions of wetland systems.
- Referenced and utilized by the cities of Lacey, Olympia, and Tumwater when their critical area ordinances were updated

**Shipman, H. 2001. Coastal Landsliding on Puget Sound: A review of landslides occurring between 1996 and 1999, Publication #01-06-019, Shorelands and Environmental Assistance Program, Washington Department of Ecology, Olympia. Web URL: <http://www.ecy.wa.gov/pubs/0106019.pdf>. Accessed online 7 January 2008.**

- Provides information about geologic hazards and historic landslide along Puget Sound

**Shoreline Management Act of 1971. 1971. Revised Code of Washington 90.58.**

**Shoreline Management Act—Streams and Rivers Constituting Shorelines of the State. Washington Administrative Code 173-18. Web URL: <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-18>.**

**Shoreline Management Act—Lakes Constituting Shorelines of the State. Washington Administrative Code 173-20. Web URL: <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-20>.**

**Simenstad, C. A., K. L. Fresh, and E. O. Salo. 1982. The role of Puget Sound and Washington coastal estuaries in the life history of Pacific salmon: An unappreciated function. Pp. 343-364 in V. S. Kennedy (ed.) Estuarine Comparisons. Academic Press, New York. 709 pp.**

**Sinclair, K. & D. Bilhimer. 2007. Assessment of Surface Water/Groundwater Interactions and Associated Nutrient Fluxes in the Deschutes River and Percival Creek Watersheds, Thurston County. Washington State Department of Ecology. Publication #07-03-002. Olympia, WA. Web URL: <http://www.ecy.wa.gov/pubs/0703002.pdf>. Accessed online 21 December 2007.**

- Describes hydrogeologic study undertaken on Percival Creek and the Deschutes River watersheds.
- Document crafted to support a TMDL evaluation of these watersheds.
- Contains water quality information, Reference section includes other studies and information about the region, including geologic history.

**South Puget Sound Salmon Recovery Group. 2006. Chinook and Bull Trout Recovery Approach for South Puget Sound Nearshore. Squaxin Island Tribe, Shelton, WA.**

- Current strategy for recovering Chinook salmon and Bull Trout in southern Puget Sound.
- Plan focuses on the Nisqually River freshwater system and the marine shorelines in southern Puget Sound.

- Contains a list and maps of shoreline stressors and habitat values by marine shoreline segments.
- Provides recommendations for restoration or preservation actions for marine shorelines based upon salmon usage and identified stressors.
- The geography includes the marine shorelines for Olympia, Lacey and Thurston County.
- Referenced by the Olympia critical area ordinance update (2006) and the adoption of “Important Riparian Areas” tied to the report recommendations.

**South Puget Sound's Best Places for Bird Watching. Web URL:**  
<http://blackhillsaudubon.com/bestplaces/index.html>. Accessed online March 2008.

- Provides a map of bird watching areas in Thurston County.
- Describes what species are found at each site and lists access points.

**Spence, B.C., G.A. Lomnický, R.M. Hughes & R.P. Novitzki. 1996. An Ecosystem Approach to Salmonid Conservation. ManTech Environmental Research Services Corporation.**

- Baseline report on the salmon habitat, needs and conservation.
- Referenced by the Olympia critical area ordinance update (2006).

**SSOE, Inc. 1998. Rite Aid Store No. 5278, Cooper Point & Mud Bay, Olympia, Washington; Preliminary Storm Drainage Report.**

- Discusses flooding and erosion control for development project at Cooper Point Road and Harrison Blvd.
- Includes results from simulated flooding events in Appendix B.
- Appended materials give extensive background information on the wetlands adjacent to Grass Lake.
- Conclusions state that Cooper Point Village project should not impact wetlands.

**Stamm, T. 1992. Deschutes River Special Area Management Plan for the Tumwater Valley. Thurston Regional Planning Council for the City of Tumwater, Olympia, WA.**

- Special Management Area Plan adopted as an amendment to the *Shoreline Master Program for the Thurston Region* (Aaland, 1990).
- Covers the Deschutes River floodplain in the City of Tumwater.

**Stanley, S., J. Brown, and S. Grigsby. 2005. Protecting Aquatic Ecosystems: A Guide for Puget Sound Planners to Understand Watershed Processes. Washington State Department of Ecology. Publication #05-06-027. Olympia, WA. Web URL: <http://www.ecy.wa.gov/biblio/0506027.html>. Accessed online 21 December 2007.**

- Provides information on how to better protect aquatic ecosystems by including information about watershed processes in resource management plans and regulatory actions.
- Can help identify areas appropriate for restoration and protection as part of the restoration plan element, and to develop site-level restoration and protection plans.
- Provides detailed information on the following watershed processes: water, sediment, phosphorus and toxins, nitrogen, pathogens, large woody debris.
- Bibliography provides many sources that deal with aquatic and marine habitat restoration.

**Susskind, M. 1996. A Spatial and Temporal Analysis of Seawall Installation: Thurston County, Washington. Masters Thesis for Western Washington University, Bellingham, WA.**

- Analysis of various cultural and shoreline factors which may be effecting the construction of pattern of bulkheads in southern Puget Sound.
- Area of analysis included the Nisqually Reach within unincorporated Thurston County.

**Swan Resource Co. 1998. Wetland Report for the Smith Lake Property: Thurston County, WA.**

- Provides wetland delineation for Smith Lake. Discusses various features of the wetland.

**Tabbutt, V. 2001. Land Cover Mapping of Thurston County – Methodology and Applications. Thurston Regional Planning Council, Olympia, WA.**

**Tabbutt, V. 2003. The Relationship of Land Cover to Total and Effective Impervious Area. Web URL:  
<http://www.trpc.org/resources/relationshiplandcovertotalimperviousarea.pdf>**

**Tabbutt, V. 2007. Memo. Completion of the Future Impervious Model Update. Web URL: <http://www.trpc.org/resources/memojan2007.pdf>**

**Talasaesa Consultants, LLC. 2003. Detailed Conceptual Wetland Buffer Enhancement Plan: Smith Lake Village, Thurston County, WA.**

- Reevaluates and confirms delineation of the Smith Lake wetland system discussed by Swan Resource Co. in 1998.
- Discusses impacts of proposed housing development, Smith Lake Village. Also lays out mitigation plans.

**Thurston Conservation District. 2004. Salmon Habitat Protection and Restoration Plan for Water Resources Inventory Area 13, Deschutes. Web URL:**

[http://www.rco.wa.gov/documents/srfb/Lead\\_Entities/Thurston/Strategy.pdf](http://www.rco.wa.gov/documents/srfb/Lead_Entities/Thurston/Strategy.pdf).

- Has general information about several Shoreline-designated waterbodies.
- Gives behavioral profile and other statistics of locally occurring salmonid species.

**Thurston Conservation District. 2000. Identification of Salmon Habitat Refugia for Protection in WRIA 13.**

**Thurston Conservation District. 2000. Private Land Culverts in WRIA 13.**

**Thurston County. WRIA 13 Watershed Assessment. Web URL:**

<http://www.co.thurston.wa.us/wwm/basin%20planning/wria%2013/wria%2013home.htm>. Accessed online 9 January 2008.

- Many data sets end at 2000 or 2001.
- Lists plans for and studies of WRIA 13, including those dealing with stormwater, wastewater and other water quality issues.
- Lists available water resources data.
- Documents which agencies have data for WRIA 13 waterbodies.
- Discusses land cover across WRIA 13, by basin and in principal streams; also gives future projections.
- Discusses basin characteristics, gives flow data.

**Thurston County, WA and the City of Olympia, WA. 1998. Green Cove Creek Comprehensive Drainage Basin Plan. Web URL:**

[http://www.co.thurston.wa.us/wwm/basin%20planning/Green%20Cove%20Creek/green\\_cove.htm](http://www.co.thurston.wa.us/wwm/basin%20planning/Green%20Cove%20Creek/green_cove.htm). Accessed online 16 January 2008.

**Thurston County Department of Water and Waste Management. 2004. 2003**

**Aquatic Plant Survey of Selected Lakes in Thurston County. Web URL:**

<http://www.co.thurston.wa.us/wwm/Lakes/General%20Lake/Aquatic%20Plant%20Survey/Final%20TC%20Survey%202003.pdf>. Accessed online 9 January 2008.

- Lists non-native plants found in various lakes in Thurston County, including several Shoreline-designated waterbodies.
- Gives general information about waterbodies and their shorelines.

**Thurston County Department of Water and Waste Management. 2004. Salmon Creek Comprehensive Drainage Basin Plan. Phase II: Alternatives, Analysis and Recommendations.**

**Thurston County Department of Water and Waste Management. Thurston County Streamflow and Temperature Monitoring Data. Web URL: <http://www.co.thurston.wa.us/monitoring/index.htm>.**

- Site contains flow and temperature data for Black Lake Ditch, Percival Creek, Upper Deschutes River and Woodland Creek.

**Thurston County Department of Water and Waste Management, Storm and Surface Water Program. 1995. Chambers/Ward/Hewitt Comprehensive Drainage Basin Plan. Web URL:**  
[http://www.co.thurston.wa.us/wwm/basin%20planning/Chambers\\_Ward\\_Hewitt/Chambers\\_Ward\\_Hewitt.htm](http://www.co.thurston.wa.us/wwm/basin%20planning/Chambers_Ward_Hewitt/Chambers_Ward_Hewitt.htm). Accessed online 16 January 2008.

**Thurston County Department of Water and Waste Management, Storm and Surface Water Program. 1995. Woodland and Woodard Creek Comprehensive Drainage Basin Plan. Web URL:**  
[http://www.co.thurston.wa.us/wwm/basin%20planning/Chambers\\_Ward\\_Hewitt/Chambers\\_Ward\\_Hewitt.htm](http://www.co.thurston.wa.us/wwm/basin%20planning/Chambers_Ward_Hewitt/Chambers_Ward_Hewitt.htm). Accessed online 16 January 2008.

**Thurston County Department of Water and Waste Management, Storm and Surface Water Program. 1994. McAllister/Eaton Creek Comprehensive Drainage Basin Plan.**

**Thurston County Health Department. 1992. Northern Thurston County Ground Water Management Plan.**

**Thurston County Public Health and Social Services Department, Environmental Health Division and Thurston County Water and Waste Management Department. 2006. Thurston County Water Resources Monitoring Report—2003-2004 Water Year, 2004-2005 Water Year. Web URL:**  
<http://www.co.thurston.wa.us/health/ehrp/pdf/AR03-05.pdf>. Accessed online 21 December 2007.

- Contains water quality data, continuous stream flow records, lake level data, and precipitation records for 2003-2004 and 2004-2005 water years.
- Also contains general information about several water bodies in WRIA 13, including land use, topography, shorelines, etc.

**Thurston County Public Health and Social Services Department. Recreational swimming beaches data for Thurston County. Web URL:**  
[http://www.co.thurston.wa.us/health/ehadm/swimming/swimming\\_index.html#beaches](http://www.co.thurston.wa.us/health/ehadm/swimming/swimming_index.html#beaches). Accessed online 06 February 2008.

**Thurston County Water and Waste Management Department, Storm and Surface Water Program. 1996. Thurston County Water Resources Profile—1985-1995. Prepared by Thurston County Advance Planning and Historic Preservation. (Hard Copy)**

- Contains historic water quality information about WRIA 13.

- Provides general descriptions of the Thurston region, including climate, physiography, surface and ground waters.

**Thurston Regional Planning Council. 2007. The Profile—25<sup>th</sup> Edition.**

- Contains general information about Thurston County.
- Provides public access data for various water resources in the major jurisdictions of Thurston County.

**Thurston Regional Planning Council. 2007. Thurston Regional Trails Plan.**

**Thurston Regional Planning Council. 2002. Final Report of the West Bay Habitat Assessment. Conducted by the R.W. Morse Company. Web URL: <http://www.trpc.org/resources/westbayhabitatassess061502.pdf>. Accessed online 7 January 2008.**

- Describes the habits of waterfowl in the West Bay area of Budd Inlet before and during the construction of the Fourth Avenue Bridge.
- Also lists species found in the area during the time of study.

**Thurston Regional Planning Council. 1999. Final Environmental Impact Statement – Capitol Lake Adaptive Management Plan. Olympia WA.**

- Final EIS of six scenarios for managing Capitol Lake.
- Includes public and agency comments on the DEIS.
- Applies only to Capitol Lake.

**Thurston Regional Planning Council. 1991. Shoreline Public Access Inventory.**

**Tumwater Planning and Facilities Department. Deschutes River Riparian Habitat Plan. Tumwater, WA. 1993.**

- A riparian planting plan adopted as a part of *Deschutes River Special Area Management Plan for the Tumwater Valley* (Stamm, 1992).
- Adopted as an amendment to the *Shoreline Master Program for the Thurston Region* (Aaland, 1990).

**United States Department of Agriculture. 1990. Soil Survey of Thurston County, Washington. USDA Soil Conservation Service in cooperation with Washington State Department of Natural Resources and Washington State University, Agriculture Research Center.**

- Describes in detail the soil types found in Thurston County.
- Soil types are superimposed on aerial photographs, allowing for analyses of which soil type(s) are associated with a given water body, property, city block, etc.
- Also describes vegetation found throughout the county, and shows its distribution.

**United States Fish & Wildlife Service. YEAR? USFWS Threatened and Endangered Species System. Web URL:**  
[http://ecos.fws.gov/tess\\_public/StateListing.do?status=listed&state=WA](http://ecos.fws.gov/tess_public/StateListing.do?status=listed&state=WA).  
Accessed online 19 December 2007.

- Lists federally recognized threatened and endangered species that are found in Washington State.

**University of Washington. Key to the Fishes of Puget Sound. Web URL:**  
<http://artedi.fish.washington.edu/FishKey/>. Accessed online March 2008.

- Lists the 71 families of fishes that have been recorded in Puget Sound.

**URS & Dewberry. 2003. Capitol Lake Floodplain Analysis. Federal Emergency Management Agency – Region X, Bothell, WA.**

- Analysis of the risk of flooding for Capitol Lake, WA.
- Resulted in a new Federal Emergency Management Agency (FEMA) one hundred year floodplain elevation for the lake.
- Integrated into the CLAMP 10 Year Plan (Skilperoort and Morrison, 2002)
- The geography includes the cities of Olympia and Tumwater.

**Walsh, T.J., and R.L. Logan. 2005. Geologic Map of the East Olympia 7.5-minute Quadrangle, Thurston County, Washington. Washington State Department of Natural Resources. Web URL:** <http://www.dnr.wa.gov/geology/pdf/gm56.pdf>.  
Accessed online 5 February 2008.

**Walsh, T.J., R.L. Logan, H.W. Schasse, and M. Polenz. 2003. Geologic Map of the Tumwater 7.5-minute Quadrangle, Thurston County, Washington. Washington State Department of Natural Resources. Web URL:**  
<http://www.dnr.wa.gov/geology/pdf/ofr03-25.pdf>. Accessed online 5 February 2008.

**Walton, J. 1993. Olympia Urban Waterfront Plan. Thurston Regional Planning Council for the City of Olympia, Olympia, WA.**

- Special Management Area Plan adopted as an amendment to the Thurston Regional Shoreline Master Program - Aaland (1990).
- Title is somewhat misleading, and only applies to the over-the-water portion of the City of Olympia marine shoreline.
- Plan recommends preparation of a “Comprehensive Habitat Plan for Budd Inlet”. This should be prepared by a habitat task force.
- Plan recommends the creation of a Habitat Advisory Committee to review habitat and mitigation and enhancement plans.

**Washington Lakes. 2007. Featured Lake Index. Web URL: <http://www.washingtonlakes.com/FeaturedLakes.aspx>. Accessed online 11 February 2008.**

- Describes fish found in select Thurston County lakes.
- Lists public access points.
- Includes photos and schematic drawings of each featured water body.

**Washington Sea Grant Program. 2005. Marine Riparian Areas: These Important Nearshore Environments Offer a Wealth of Functions and Benefits. Washington Sea Grant Program. Seattle, WA.**

- Summary flyer of the known values and functions of marine riparian areas along Puget Sound.
- Referenced by the Olympia critical area ordinance update in 2006.

**Washington State Department of Ecology. 2008. Surface Water Quality Standards page. Web URL: <http://www.ecy.wa.gov/programs/wq/swqs/index.html>. Accessed online February 2008.**

- Gives a general overview of Washington's surface water quality standards, including a link to the WACs.

**Washington State Department of Ecology. ISIS Report for Thurston County. Provided by Jean Rakestraw & Carol Dorn February 2008.**

**Washington State Department of Ecology. 2008. Leaking Underground Storage Tanks List for Thurston County. Integrated Site Information System (Web Reporting). Web URL: <https://fortress.wa.gov/ecy/tcpwebreporting/reports.aspx>. Accessed online 4 March 2008.**

**Washington State Department of Ecology. 2008. Confirmed and Suspected Contaminated Sites. Integrated Site Information System (Web Reporting). Web URL: <https://fortress.wa.gov/ecy/tcpwebreporting/reports.aspx>. Accessed online 4 March 2008.**

**Washington State Department of Ecology. 2007. Determining an Ordinary High Water Mark on Shorelines of the State. PowerPoint Presentation 16-17 May 2007.**

- Describes how to locate OHWMs in the field, in various marine and freshwater environments.
- Also reviews office methods.
- Includes guide to riparian plants in western Washington.

**Washington State Department of Ecology. 2005a. 2004 Integrated Water Quality**

**Assessment—2004 Water Quality Listings by Category.** Web URL: [http://www.ecy.wa.gov/programs/wq/303d/2002/2004\\_documents/2004\\_wq\\_assessment\\_cats.html](http://www.ecy.wa.gov/programs/wq/303d/2002/2004_documents/2004_wq_assessment_cats.html). Accessed online 19 December 2007.

- Lists impaired waterbodies by category, including parameters and media.

**Washington State Department of Ecology. 2005b. 2004 Integrated Water Quality Assessment—2004 Contaminated Sediment Listings by Category.** Web URL: [http://www.ecy.wa.gov/programs/wq/303d/2002/2004\\_documents/seds\\_listings-cat.html](http://www.ecy.wa.gov/programs/wq/303d/2002/2004_documents/seds_listings-cat.html). Accessed online 19 December 2007.

- Lists impaired sediments by category, including parameters.

**Washington State Department of Ecology. 1980. Coastal Zone Atlas of Washington; Volume 8, Thurston County.**

- Baseline conditions of the Thurston County marine shoreline printed in a large, color map folio.
- Contains a variety of data collected from the late 1970s including: geology, fisheries habitat, shoreline armoring, land use, and shellfish aquaculture use.

**Washington State Department of Fish and Wildlife. 2007. Fishing in Washington—Sport Fishing Rules. 2007/2008 pamphlet edition.** Web URL: <http://wdfw.wa.gov/fish/regs/2007/2007sportregs.pdf>. Accessed online February 2008.

- Provides sport fishing regulations for Washington State for fish and shellfish, effective from 5/1/2007-4/30/2008.

**Washington State Department of Fish and Wildlife. 2006. Deschutes Estuary Feasibility Study: Net Benefit Analysis – Stakeholder Involvement.** Olympia, WA.

- Part of the Deschutes Estuary Feasibility Study – CLAMP Management Objective #2.
- Summarized the community values about the Capitol Lake basin.
- Applies to Capitol Lake and Budd Inlet.

**Washington State Department of Fish and Wildlife. 2006. Geographic Information System Digital Data Documentation.**

- Describes digital fish, wildlife and habitat data available from WDFW.
- General background information on data compilation methods, organization, structure, details on using digital data.

**Washington State Department of Fish and Wildlife. 1997. Salmonid Screening, Habitat Enhancement and Restoration Division-Lands and Restoration Services**

**Program. Web URL: <http://wdfw.wa.gov/hab/tapps/reports/1997sshear.pdf>. Accessed online 8 January 2008.**

- Provides limited information on fish barriers in Thurston County.

**Washington State Department of Health—Office of Shellfish and Water Protection. 2007a. 2006 Annual Inventory of Commercial and Recreational Shellfish Areas in Washington State. Web URL: <http://www.doh.wa.gov/ehp/sf/Pubs/annual-inventory.pdf>. Accessed online 9 January 2008.**

- Discusses threatened shellfish growing areas, and the status and trends of fecal coliform in commercial shellfish beds.
- Describes what various water quality classifications mean, as they pertain to shellfish growing.

**Washington State Department of Health—Office of Shellfish and Water Protection. 2007b. Atlas of Fecal Coliform Pollution in Puget Sound: Year 2005—A Report for the Puget Sound Assessment and Monitoring Program. Web URL: <http://www.doh.wa.gov/ehp/sf/Pubs/fecalreport.pdf>. Accessed online 9 January 2008.**

- Contains fecal pollution summaries for Henderson Inlet, Nisqually Reach and Eld Inlet.

**Williams, G. & R. Thom. 2001. White Paper: Marine and Estuarine Modification Issues. Battelle Marine Science Laboratories, Sequim, WA.**

**Williams, M. et. al. 1995. Thurston Regional Wetland and Stream Corridor Inventory: Phase III – Deschutes River Middle Reach. Michael P Williams Consulting, Inc., Seattle, WA.**

- Wetland mapping of approximately 100 square miles within the Deschutes River watershed.
- Delineates the data sources, protocol, and results of the project.
- Included a limited amount of field reconnaissance.
- GIS wetland data layer and section maps created by Thurston Regional Planning Council.
- The geography included unincorporated Thurston County.

**Zalewsky, B. 2002. Quality Assurance Project Plan: Woodland Creek Temperature TMDL. Washington State Department of Ecology. Publication No. #02-03-077. Olympia, WA. Web URL: <http://www.ecy.wa.gov/pubs/0203077.pdf>. Accessed online 28 January 2008.**

- Discusses sources of thermal pollution in Woodland Creek.