BUDD INLET RESTORATION PARTNERSHIP

Phase II Report

Prepared for WSU Thurston County Extension,
the City of Olympia, the City of Tumwater,
Thurston County, the Port of Olympia,
the LOTT Clean Water Alliance and
the Washington State Department of Ecology

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BUDD INLET RESTORATION PARTHERSHIP

Phase II Report

BACKGROUND AND PURPOSE

In Spring 2008 the City of Olympia, City of Tumwater, Thurston County, Port of Olympia and the LOTT Alliance began a process to explore how their shared interests in Budd Inlet protection and restoration might support joint efforts to improve the health and vitality of the Inlet. The Washington State Department of Ecology funded the effort based, in part, on the potential for inter-jurisdictional efforts to support the many decisions about environmental cleanup on or in the lower inlet. WSU Thurston County Extension convened the effort and acted as the jurisdictions' fiscal agent. These interests resulted in a review and compilation of current efforts related to Budd Inlet, a public forum/meeting to describe community hopes and concerns for the Inlet and a sense that it would be fruitful to explore more specific ways the jurisdictions might work together in a Phase II effort.

Early in 2010, the jurisdictions reconvened in a Phase II effort, also funded by the Washington State Department of Ecology and convened by WSU Thurston County Extension. The main purposes of Phase II were to:

- Partner with the Squaxin Island Tribe to support their independent production of a landscape assessment of Budd Inlet focused on potential habitat conservation and restoration projects.
- Develop an integrated map showing habitat types, public access and recreation points, cleanup sites, land use planning and other information.
- Identify approaches to direct off-site, out-of-kind or in-kind aquatic permit mitigation efforts to high-priority habitat conservation and restoration sites.
- Evaluate potential structural models for the Parties and assist in development of a structure for the Parties if needed to implement any future collaborative projects.

This report summarizes the key outcomes of Phase II and provides a brief overview of each of the main dimensions of work. Attachments provide additional detail on work completed.

KEY OUTCOMES

As at the end of Phase I of the project, many decisions related to the protection, clean up and restoration of Budd Inlet are still pending. In particular, decisions are pending on:

- Whether to maintain Capitol Lake as a lake or return it to an estuary
- The completion of the Deschutes River/Capitol Lake/Budd Inlet water quality study (or TMDL) and development of the related water cleanup plan

In addition, the jurisdictions around and near Budd Inlet individually and together continue to invest significant resources into development and redevelopment in the lower inlet including the ongoing projects such as the East Bay Redevelopment, Percival Landing Redevelopment, and

West Bay Park. These projects, work that will be carried out at the many environmental cleanup sites in the lower inlet, and the work of the Squaxin Island Tribe to develop a user-friendly inventory of potential habitat conservation and restoration projects in the Inlet continue to create *a unique opportunity to make significant progress on Budd Inlet restoration in the near term*.

Attachment 1 summarizes ongoing projects and key milestones in Budd Inlet.

The jurisdictions remain committed individually and collectively to making significant progress on Budd Inlet restoration and to using the Squaxin Island Tribe habitat assessment to actively inform that work; however they believe that their existing relationships and working arrangements augmented by their participation in the recently formed Alliance for a Healthy South Puget Sound the recognized Local Integrating Organization for Puget Sound recovery efforts, create adequate structure for them to effectively coordinate and collaborate. The jurisdictions determined that they did not need to form a new structure specific to Budd Inlet restoration efforts at this time.

SUMMARY OF PHASE II ACTIVITIES

Database of Habitat Restoration Projects in Budd Inlet

The Squaxin Island Tribe independently reviewed over 20 years worth of existing assessments and reports on habitat restoration in Budd Inlet to inventory and evaluate potential habitat conservation and restoration projects. To augment that work, they also independently convened a group of experts with diverse technical and scientific knowledge specific to Budd Inlet and worked with them to identify and prioritize restoration actions and opportunities within Budd Inlet. The group discussed the inventory of potential projects, and had a scientific/technical discussion of what defines Budd Inlet, what makes it unique in South Sound, and many of the problems and opportunities in the Inlet. The group described “regions” of the Inlet and identified potential near-term opportunities (i.e., 10 year or less time horizon) in each Region.

Ultimately, the Squaxin Island Tribe described over 100 potential projects for habitat restoration. This inventory of habitat restoration potential was recorded in excel spreadsheets and a GIS map interface to create an easily usable interactive tool for local governments and organizations to determine where to best apply their efforts. The Tribe also suggested an initial strategy for approaching Budd Inlet restoration and some initial priority projects in each region of the Inlet. Finally, they provided the jurisdictions and others with detained information on the landscape assessment and how it can be used in numerous workshops and meetings attended by over 125 individuals. Attachment 2 contains the products produced by the Tribe.

Integrated Map of Budd Inlet

The results of the Squaxin Island Tribe habitat assessment results and fifty-five other data layers including data on shoreline armoring, city and county boundaries and zoning, critical areas, overwater structures, parks and access points, priority habitats and species, and wetlands were compiled into an integrated GIS project for Budd Inlet. This GIS project will enable the jurisdictions to easily see how their potential development and redevelopment, conservation and restoration projects fit with other projects and conditions around the Inlet and to create customized maps for their use.

Each individual jurisdiction has independent use of the GIS project and can add it to their suite of GIS resources. Thurston County GeoData center volunteered to serve as a focal point for data updates and will work with the other jurisdictions to summarize data layer updates annually. Attachment 3 is an example of one of the integrated maps that can be produced using the GIS project.

Aquatic Mitigation

As part of Phase II the jurisdictions considered a number of potential options that might be used to direct mitigation investments towards high-priority habitat conservation and restoration projects in Budd Inlet. These included relatively simple approaches that the jurisdictions could implement independently or together; more complex approaches that likely would require additional collaboration; and third-party mitigation approaches.

The relatively simple approaches considered included:

- Advance mitigation, where a jurisdiction identifies its likely impacts and creates the mitigation in advance of those impacts;
- Amendment of jurisdiction policies and regulations to prefer the use of priority conservation or restoration sites for mitigation, or even require their use in some circumstances;
- Adjustment of mitigation ratios, bond requirements, permit fees or other regulatory requirements for mitigation projects that occur at a priority site;
- Development of guidelines for the types of impacts that might be offset with each priority conservation or restoration site/project. That is, identify priority conservation or restoration projects and pre-assess what types of impacts those projects might be used to mitigate, thus making it easier for a developer or other party with mitigation responsibilities to understand and use the priority projects for their individual mitigate responsibilities.

More complex approaches considered included:

- Development of a Special Area Management Plan (SAMP) to outline impact and mitigation scenarios in Budd Inlet;
- Development of tailored critical areas or shoreline buffers;
- Development of a cap and trade program for certain types of impacts such as bulkheads.
- Establishment/facilitation of a private market mitigation exchange.

Third party mitigation approaches also were discussed, such as an in-lieu fee program or a mitigation bank.

Ultimately the jurisdictions determined not to formerly pursue any of the options to direct mitigation investments at this time. The list of potential mitigation approaches considered is summarized in Attachment 4.

Potential Partnership Models and Structure

The jurisdictions considered nine other locally-driven partnership efforts to determine if one or more models might illustrate a potential path forward for the Budd Inlet partnership.

The profiles were developed through a combination of web-research, brief telephone interviews with a few key project leaders, and review of the partnerships' governance and other background documents. Each profile contains information on why the partnership was established (goals and mission); the partnership model (governance and participating parties); funding sources; accomplishments to date; and current status. The partnerships considered were:

- Citizens for a Healthy Bay
- The Nisqually River Council
- The Lower Columbia River Estuary Partnership
- Snake River Salmon Recovery Board
- Chehalis Basin Partnership
- Oakland Bay Stewardship Initiative
- Bellingham Bay Waterfront Redevelopment/ Demonstration Pilot
- Port Angeles Rayonier Mill Redevelopment
- Port of Anacortes Restoration/Redevelopment

Ultimately the jurisdictions determined that their existing relationships and informal collaborations were adequate to support their continued efforts to work together and separately on Budd Inlet issues and therefore they did not need to invest in creation of a formal partnership. The jurisdictions also were mindful of the newly formed Alliance for a Healthy South Puget Sound, which is the recognized Local Integrating Organization for the Puget Sound. The jurisdictions were interested in relying on the Alliance for a Healthy South Puget Sound, rather than creating a separate effort, as the better forum for them to participate in and influence Puget Sound recovery efforts.

The other partnership profiles and a summary of key themes and observations from the profile work are included in Attachment 5.

ATTACHMENT 1

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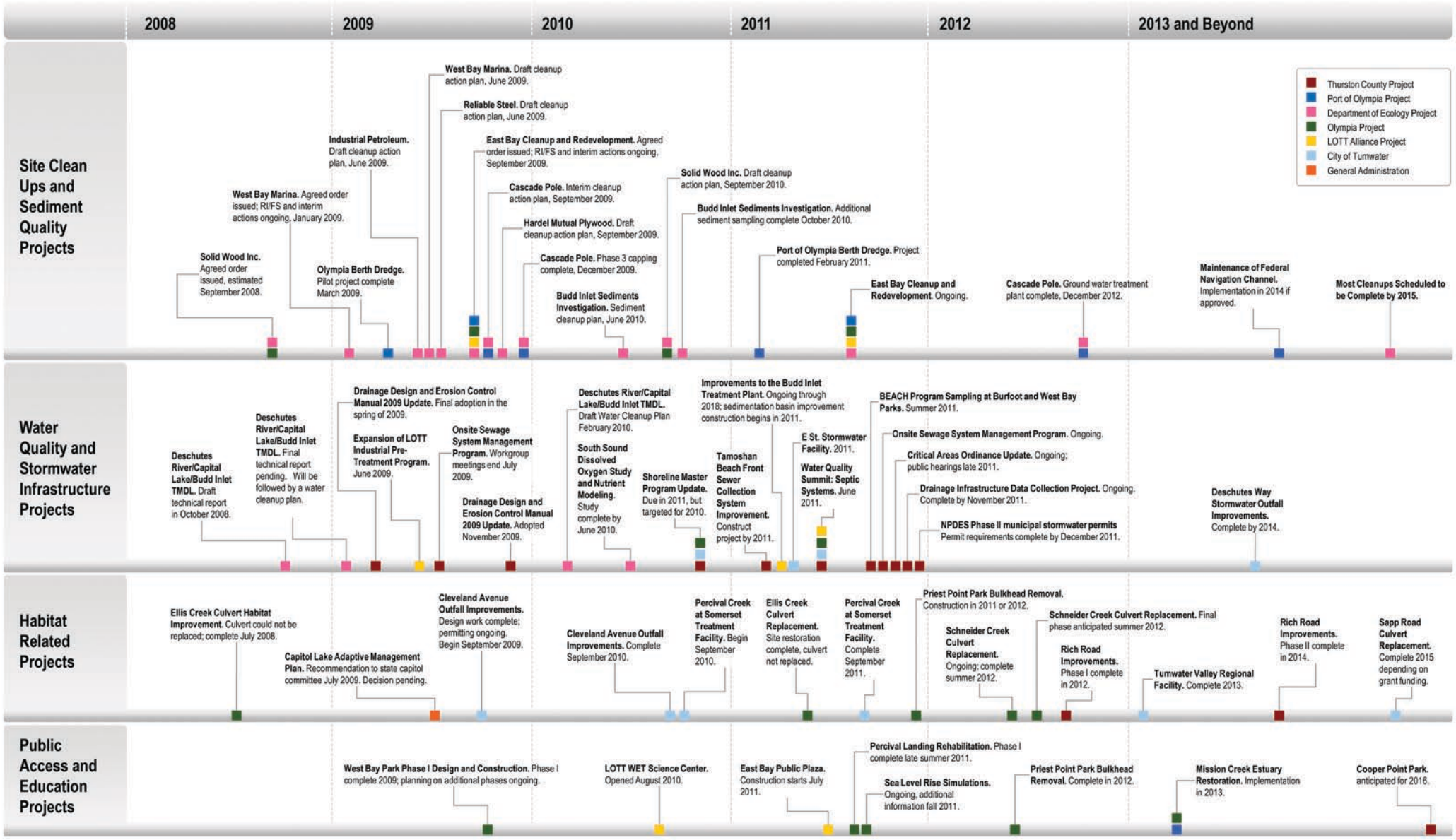
Budd Inlet Partnership—Integrated Project Timeline



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LOTT Projects

Project Title	Brief Description	Update
Budd Inlet Treatment Plant Improvements	About $100 million in improvements are planned for the Budd Inlet Treatment Plant (BITP) to sustain the life of the treatment plant and further improve efficiency of the treatment process. Budd Inlet Treatment Plant Master Plan was completed in 2006 and BITP Improvements are planned through 2018. The largest project involves building two new Primary Sedimentation Basins and rehabilitation of seven existing basins. Continued use of the old basins will help with storage of wastewater during high flow events, minimizing the potential for discharge of untreated or partially treated flows into Budd Inlet. Construction will begin August 2011. Other planned projects include process control improvements, expansion of reclaimed water production, odor control, and emergency power improvements.	
LOTT Water Education and Technology (WET) Science Center	A new 2600 square foot education center was built as part of LOTT's new Regional Services Center building on the grounds of the Budd Inlet Treatment Plant. The WET Science Center includes interactive exhibits for all ages that encourage stewardship and concern for water and teach about LOTT's critical functions of wastewater treatment and reclaimed water production. A stream-like reclaimed water feature with accompanying interpretive elements extends across the front of the Regional Services Center and will extend across to a planned Public Plaza. Exhibits will encourage visitors to appreciate water as an essential resource. The WET Science Center opened in August 2010.	The Center has been integrated into the middle school science curricula of both the North Thurston and Olympia School Districts. The program is expected to be extended to the Tumwater School District in the 2011-2012 school year. LOTT will also be coordinating educational programs and activities with the new Hands On Children's Museum, which will be opening across the street in summer 2012.
East Bay Public Plaza	Public education about reclaimed water will be the focus of a new East Bay Public Plaza, which will be under construction starting in July 2011. Opening is expected to be in June 2012. Environmental cleanup of the East Bay site, under the Port of Olympia's Agreed Order with the Department of Ecology, is a major part of the project. The stream-like reclaimed water feature is designed to represent watershed elements, allow public interaction with the water, and incorporate various interpretive elements.	
Water Quality Monitoring	LOTT gathers water quality information on Budd Inlet and LOTT's discharge to the Inlet on a routine basis. LOTT has been monitoring these parameters since the early 1980s and has retained much of that data which documents the continued improvement of water quality in Budd Inlet. LOTT will continue to monitor for these parameters as long as the treatment plant discharges into Budd Inlet and as long as LOTT is required to do so under conditions of the NPDES permit issued by Ecology.	
Industrial Pre-treatment	LOTT administers a regional industrial pretreatment program required by the Department of Ecology as part of LOTT's NPDES Permit. Through a set of	

Program	regulations appended to the LOTT Interlocal Agreement, the four LOTT partner jurisdictions have adopted identical pretreatment ordinances. The focus is on significant industrial users and high-strength dischargers to prevent introduction of pollutants that could interfere with treatment processes, impact receiving waters (Budd Inlet) or biosolids quality, and/or threaten workers' safety. The program is on-going. An annual report is submitted to Ecology by March 1 each year. The program was expanded in 2009 to include minor industrial users.	
Water Quality Summit: Budd Inlet	In May 2004, the LOTT Board of Directors hosted an interagency Water Quality Summit focusing on Budd Inlet. Participating elected officials represented Lacey, Olympia, Tumwater, Thurston County, and the Squaxin Island Tribe.	
Water Quality Summit: Septic Systems	In June 2011, the LOTT Board of Directors is hosting an interagency Water Quality Summit for elected officials of Lacey, Olympia, Tumwater, and Thurston County focused on septic systems in the urban area, including impacts to groundwater, surface waters, and Budd Inlet.	This summit is scheduled for Wednesday, June 29, 2011.

City of Olympia Projects

Project Title	Brief Description	Update
Onsite sewage system conversion program	Provide sewer extensions and financial assistance to onsite system owners within Olympia in order to gradually convert over 2,000 onsite systems to sanitary sewer.	Ongoing.
Ellis Creek Culvert Replacement	Replacement of the existing Ellis Creek culvert under East Bay Drive with a fish-passage culvert. The new culvert will allow various salmon species to reach the relatively healthy aquatic habitat provided by Priest Point Park. Construction begins in July 2008.	Site restoration following construction completed, but culvert was not replaced.
Schneider Creek Culvert Replacement	Replacement of the existing Schneider Creek culvert under West Bay Drive with a fish-passage culvert. The new culvert will allow various salmon species to access upstream aquatic habitat. Construction begins July 2008	Final phase of the project planned for summer 2012.
Evaluation of sea level rise implications to downtown Olympia	Various work efforts including computer simulation of potential flooding in the downtown area and installation of GPS technology to monitoring potential land subsidence will be completed in 2008/2009.	Ongoing work effort to evaluate potential downtown risks. More information available in the fall of 2011.
West Bay Park Phase I Design and Construction	Design and construction of Phase I park improvements on approximately 4.3 acres on west side of West Bay. Includes site clean up, shoreline habitat enhancements, trails, landscaping, hand held boat launch, interpretation, parking and seating. City of Olympia has signed an Agreed Order for Site Remediation with the Department of Ecology. Project includes grant funding from the Washington Wildlife and Recreation Program, Aquatic Lands Enhancement Account, and Creosote Treated Piling Removal Program. Area Rotary Clubs are fundraising in the community for donations for the Rotary Point viewpoint to be constructed within the park. Phase I construction complete in 2009	Done. Master planning work for additional phases is underway. ?
Percival landing major rehabilitation project	Develop a phase approach to rebuilding Percival Landing. Includes: maintenance dredging, removal of all creosote pilings, removal of debris in the tidal range, installation of natural marine substrate, planting of shoreline riparian vegetation, reconstruction of the pedestrian board walk and adjacent uplands to include small pavilions (living libraries), a restroom and interactive play facility. Goal of obtaining silver LEED certification. Phase I 30% design to be complete in September 2008; phase I demolition and construction in later 2009.	In progress. Complete late summer 2011.
Priest Point Park bulkhead removal	Shoreline restoration in the northern portion of the Park in conjunction with South Puget Sound Salmon Enhancement Group.	Construction in 2011 or 2012
Mission Creek earthern berm removal	City Parks and Water Resources support to the Port of Olympia in State grant proposal	Funding to be determined.

Port of Olympia Project Sheets

Project Title	Brief Description	Update
Port of Olympia Berth Dredge	The berth was last maintained (dredged) in 1977. Since then, sediment has been settling in the berth area,and federal navigation channels. The depth of the berth area is authorized to be 42 feet below mean lower low water (MLLW) and is as shallow as 29 feet in some areas. The first phase of the project was a pilot project to dredge a limited portion of the berth to determine if all contaminated (dioxin containing) material can be removed and maintained in a clean condition.	The pilot project was completed in March 2009, and post-dredging monitoring was completed in February 2011. The Port in early planning for the next phase of sediment investigation and cleanup in the berth area..
Cascade Pole MTCA Site	Remediation and restoration of the site formerly operated by Cascade Mcfarland and other tenants as Cascade Pole, a pole treatment facility. Phase 2 capping will be completed in 2008 and Phase 3 in 2009. A new ground water treatment plant is scheduled to be built in 2012.	Phase 2 and 3 capping are complete. Engineering design of a new water treatment plant is complete and construction is underway.
East Bay maintenance dredging	Dredging to restore authorized depths in the marina and Boatworks areas of East Bay. This project is on hold pending determination of dredge spoil alternatives. The areas previously sampled demonstrated low levels of dioxin contamination.	
Maintenance of Federal Navigation Channels	The dredging of the federal navigation channel, including the turning basin is intended to maintain authorized depths within the existing channels in West Bay and East Bay. .	The Port is in early discussions with the Corps of Engineers regarding federal budget appropriations and project planning to implement the maintenance dredging of the navigation channels. Potential project implementation would be in 2014 or later.
East Bay Redevelopment	Redevelopment of approximately 14 areas located at the southern end of East Bay. Includes demolition of a 140,000 sf warehouse, environment remediation, installation of new drainage, pavement, light and other features that will allow economic development including the LOTT expansion and education center, the Hands On Children's Museum and a public plaza.	In progress
Mission Creek Estuary Restoration	The Port is co-sponsoring the restoration of the Mission Creek estuary with the South Puget Sound Salmon Enhancement Group, and has applied for SRFB grant funding to implement the project. The project will restore fish passage and estuarine functions at Mission Creek on the east bank of Budd Inlet, by removing an existing road embankment, culvert, and accumulated sediments.	Projected implementation in 2013.

Thurston County Project Sheets

Project Title	Brief Description	Update
Shoreline Master Program Update	State-mandated update of Shoreline Plan for areas surrounding major water bodies; including environmental assessment and update of regulations. Comprehensive update of Thurston County Shoreline Master Program for compliance with the 2003 updated SMP guidelines. Due in 2011, but targeted for 2010.	Thurston County's Shoreline Master Program update is in progress. A draft Shoreline Inventory, Analysis and Characterization report has been completed and is posted on the Thurston County SMP web page at: http://www.co.thurston.wa.us/PLANNING/shoreline/shoreline_home.htm Preliminary identification and mapping of Shoreline Environmental Designations are also posted with the DRAFT Shoreline Environmental Designation Report. Over the next year, draft policies and regulations will be developed along with the Cumulative Impacts report and Restoration Plan. Public involvement will be encouraged and facilitated through additional outreach and meetings.
Drainage Design and Erosion Control Manual 2009 update	Project will update the County's drainage manual to meet the equivalency requirements of the 2005 DOE Manual as mandated in the NPDES Phase II permit. The draft manual is scheduled to have final draft completed in October 2008, with final adoption in the spring of 2009.	The County updated the drainage manual in accordance with the Phase II NPDES permit in 2009. The 2009 DDECM was adopted by he BOCC on August 17, 2009 with an effective date of November 16, 2009.
Drainage infrastructure data collection project	Collect field data to adequate identify the characteristics of the County's stormwater drainage systems. The data collected shall represents all attributes of the facilities, conveyances and contributing areas. Project began April 2008. The County's NPDES regulated area is anticipated to be completed by December 2011, with full project completion due over the next several years.	The county has completed the infrastructure data collection on the west side of Budd Inlet and should have the infrastructure on the east side within the NPDES regulated area by November 20111.
Interlocal Ambient Monitoring Program	On-going monthly stream monitoring for water quality at 3 sites on the Deschutes River and 5 tributaries. Five additional urban streams discharging into Budd Inlet are sampled every other year.	Ambient water quality monitoring is ongoing, on a monthly basis, at the 3 Deschutes sites, 5 tributaries to Budd Inlet and 5 tributaries to the river.
Critical Areas Ordinance update	This CAO update was part of the 2004 comprehensive plan update. It has been delayed as County staff has been directing their efforts towards addressing GMA compliance appeals and Growth Mgt. Hearing Boards decisions. A draft went out for public review in the fall of 2004. The Thurston County Planning Commission is reviewing the document in response to large	The process for updating the 1994 version of the county's Critical Areas Ordinance is well underway. In October 2010, the Thurst on County Planning Department held a serie s of community open h ouses to discuss updates to the Ordinance and prairie habitat protections. Since that time, the Department has be en working on a draft ordinan ce that takes into consideration the concerns and ideas presented by residents.

	public comment and anticipates that the second review draft will be available for presentation to the Thurston County Board of Commissioners by the end of 2008.	The following web page features the chapters that have been drafted thus far: http://www.co.thurston.wa.us/PLANNING/critical_areas/criticalareas-chapters.html These draft chapters have been, or will be, presented to the Planning Commission for review and work sessions over the next several months. When the draft chapters are completed, the Planning Commission and the Board of County Commissioners will each hold public hearings on the potential amendments to the Critical Areas Ordinance. The public will be notified when the complete draft CAO is available and of any hearings once they are scheduled. It is anticipated this will be sometime in the second half of 2011. Interested individuals are welcome to sign up for the Department's web mail service to receive updates by e-mail. Sign up is located at: http://www.co.thurston.wa.us/PLANNING/contact/constant_contact.html
Cooper Point Park	Development of a 32-acre park site on the Cooper Point peninsula. Provides upland passive recreational opportunities and controlled access to Budd Inlet. Date of completion anticipated for 2014, depending on funding.	The 32 acre Cooper Point Park project is currently listed in the CFP for 2016 development. The property has not had any improvements/Master Planning completed to-date. The project will remain in the next version of the CFP for 2016.
Tamoshan Beach Front Sewer Collection System Improvement	Eliminate and relocate gravity sewer main and lift station from beach. Complete engineering drawings by 2009, seek funding by 2010, construct project by 2014.	The engineering drawings are complete and funding has been identified. Right-of-entry agreements from the effected property owners are pending. Once those are completed, the county will go out for bid. It is expected that construction will be completed in 2011.
Tamoshan/Beverly Beach Wastewater Treatment Facility Upgrade	Eliminate Beverly Beach sewer plant, upgrade Tamoshan sewer to accommodate waste from both communities and install new sewer lift station at Beverly Beach. Project complete- facility on-line.	Upgrades to the sewer treatment facility were completed in 2001 and are still in operation.
Boston Harbor Wastewater Facility	Construct new wastewater facility for the community of Boston Harbor. Project complete- facility on-line	Upgrades to the water plant were completed in 1999 with a new water tower in 2002 as a result of damage to the existing one from the Nisqually earthquake. Upgrades to the sewer treatment facility were completed in 2001.
Rich Road Roadway Improvements	Re-align roadway to meet current design standards. Project timeline 2009-2010	Phase I (Deschutes River Bridge to 87th Ave) to be constructed summer of 2012 and Phase II (87th Ave to Normandy Dr) tentatively to be constructed summer of 2014.
Budd Inlet Sediment	The Department of Ecology is investigating sediments in lower	In October 2010, Thurston County Public Health and Social Services

Investigations (2007 & 2008) – participation by TC Public Health and Social Services	Budd Inlet to find out the extent of contamination with dioxins/furans and other toxics of environmental and public health significance. Thurston County Public Health and Social Services (TCPHSS) is involved along with the Department of Health's Environmental Health Assessment program to evaluate the sampling results, make recommendations to Ecology, and provide public health information to the public. Phase 2 was completed in March 2008 (comments on study allowed through June 17, 2008). Additional investigations and sampling are proposed.	(County Health) sampled in Budd Inlet. The goal of this study is to determine if dioxins in sediments at Priest Point Park public access areas are a risk to human health. In 2007 Ecology did a sediment study in Budd Inlet. DOH evaluated the results of that study and concluded that there was no apparent health hazard for people exposed to Budd Inlet sediments. DOH did recommend collecting more samples in public access areas, specifically Priest Point Park beaches. County Health collected 30 samples from surface sediments (top 10 centimeters) at 15 locations along Priest Point Park beaches. Dioxin levels ranged from **0.091** to **4.8 parts per trillion** (ppt). These levels are lower than the average level of dioxin Ecology found during the 2008 Sediment Investigation. The average dioxin level in Budd Inlet surface sediments was 19.1 ppt.
BEACH program	The marine water at Priest Point Park, Burfoot County Park, Seashore Villa Community Beach and Fiddelhead and Swantown Marinas were sampled as part of the BEACH program to assess conditions for water contact recreation. Priest Point and the marinas were sampled in 2004. Seashore Villa was sample in 2005. Burfoot Park was sampled in 2004, 2006 and will be sampled in 2008.	Priest Point Park shoreline has a permanent water recreation advisory. In 2011 Burfoot County Park and the City of Olympia's new West Bay Park will be sampled through the BEACH program.
Deschutes Watershed Toxics Ed.	A pilot project to coincide with Ecology's TMDL for the Basin, with focus on changing behaviors that contribute to the toxics load of the Basin. Outcome: Reduce population-based toxics in selected areas of the Basin. Ecology grant funded and will include mobilizing student science to measure effectiveness. Fall 2008	The proposed project did not receive grant funding, however, ongoing toxics reduction activities include: Point-of-purchase program which distributes approximately 20,000 Common Sense Gardening guides, oil, paint, green cleaning, Protect Kids from Toxins, IPM prescriptions and other publications each year at 50 retail and community sites. Direct contact to approximately 4,500 people each year through workshops, presentations, school programs, participation in community fairs and events, and training to retail garden center staff, Master Gardeners, Master Recyclers, and other volunteer groups. Tens to hundreds of thousands of indirect contacts through newspaper and newsletter articles, website, displays, and media campaigns as budget & priorities allow. The citizen science portion would also be ongoing general, rather than

		targeted to residents in the Deschutes watershed. Project GREEN watershed education focuses on schools and StreamTeam focuses on community members (mostly adult) to do activities such as water quality monitoring, the annual GREEN Student Congress, teacher workshops, community workshops, special events, and revegetation projects.
On-site Sewage System Management Plan	New plan adopted by the Thurston County Board of Health in January 7, 2008. Includes a strategy for identifying areas where OSS pose a significant public health risk and for establishing operation, maintenance and permitting standards for OSS within those areas Budd Inlet is identified in the management plan as an area that should be evaluated to determine if it should be classified as a sensitive area. Planning work will be complete in July 2009 with regulation changes, if needed, happing later in 2009.	The identification of sensitive areas as described in Thurston County's On-Site Management Plan have not been implemented due to limited funding and staffing levels.
Pesticide Free Neighborhood	Thirteen homes on East bay Drive participated in a 1-year intensive project to reduce the use of chemical fertilizers and pesticides along Budd Inlet. February 2002 – 2003.	This project was funded through a Department of Ecology supplemental grant that ended in February 2003. Over the course of the one year project, over 100 pounds of pesticides were properly disposed of from 11 households on the Budd Bay waterfront. All 13 participating households reported that they would continue to utilize pesticide-free methods of yard care and have in fact, worked together to create pesticide-free community spaces on the Budd Bay shoreline. Residents of Budd/Deschutes and all of the Thurston County can pledge to be pesticide-free and receive a pesticide-free zone garden sign. Please contact Jenifer Johnson at 867-2577 if more information is needed.

City of Tumwater Projects

Project Title	Brief Description	Update?
Site 150 Streambank Restoration Project	Stabilize the streambank at "Site 150" located along the Tumwater Valley Municipal Golf Course using a combination of bioengineering and revegetation. "Site 150" was identified as a contributing source of sediments to the Deschutes River and, ultimately, Capitol Lake and Budd Inlet. The project was completed in 2005.	
Cleveland Avenue Outfall improvements	Design and construct a stormwater treatment facility on property currently owned by the Tumwater Valley Municipal Golf course. This faciltity will be designed to treat and detain stormwater to the Deschutes River from a drainage area of approximately 110 acres, serving a residential area.	Initial design work has been completed. Staff will be developing permitting applications and seeking funding assistance for construction.
Tumwater Valley Regional Facility	Design and construct a regional facility for treatment and detention of stormwater discharge form three major stormwater basins – M Street, Littlerock/2nd Avenue, and Linwood Avenue, all consisting of a drainage area of about 400 acres. Wetland mitigation may be necessary, although the project is conceptualized as a constructed wetland designed to treat and detain stormwater discharges to the Deschutes River and, Ideally, further protect and enhance aquatic habitat. The project is estimated to be complete in 2013, dependent upon availability of grant funding.	Initial design is underway; expected complete by Jan 2012. Staff will be developing permitting applications and seeking funding assistance for construction.
Sapp Road Culvert Replacement	Replace the existing culvert at Sapp Road. Due to its size, gradient and elevation the existing culvert has become a barrier to fish passage upstream and downstream. Work with SPSSEG and WDFW to complete design and construction of the project. Grant funding is being sought, the project is estimated to be compete in 2015.	
Percival Creek at Somerset Treatment Facility	Protect Percival Creek from further degradation by stormwater-related pollutants and erosion at unmitigated outfalls near the Somerset Hill drive crossing. At treatment facility will be designed and constructed using the most current technology to treat a drainage area of approximately 75 acres. Estimated to begin in 2010 and be complete in 2011.	Initial design work has been completed. Staff will be developing permitting applications and seeking funding assistance for construction.
E Street Stormwater Facility	Replace existing untreated stormwater outfall with a facility similar to a constructed wetland for treatment and detention of stormwater flows from Linwood Ave to E Street.	Initial design work has been completed. Staff will be developing permitting applications and seeking funding assistance for construction.
Deschutes Way Stormwater Outfall Rehabilitation	Grant funded work estimated to begin during the summer of 2011 to retrofit an existing stormwater outfall with a treatment system to help improve stormwater quality discharging to the Deschutes River.	Design is underway; installation of treatment system expected complete by November 2011. Project is grant funded.
Pioneer Park Riverbank Stabilization	Recent storms have eroded a stretch of river bank along the Deschutes River at Pioneer Park. Staff are coordinating with local organizations to review feasibility for bank re-vegetation and stabilization, wood placement and water	

	quality improvement measures. Grant funding will be sought for assistance with project design and construction. Project is estimated to be complete by 2014.	
Shoreline Master Plan Update	Tumwater is currently updating the Shoreline Master Plan.	

ATTACHMENT 2

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Conceptual Approach to Prioritization for Restoration and Conservation of Budd Inlet, South Puget Sound, WA

Squaxin Island Tribe Natural Resources and Kyle Brakensiek

Report Version 1, October 18, 2010

The following outlines a scheme to identify and prioritize areas throughout Budd Inlet for restoration planning.

1. Conceptualizing restoration strategies
2. The problem in defining "ecosystem processes"
3. Broad indicators and priorities for intact ecosystems throughout the Puget Sound nearshore
4. A course assessment scheme for prioritizing restoration
   - 4.1 Quantitatively defining impaired ecosystems versus intact ecosystems using land cover data
   - 4.2 Quantitatively defining impaired ecosystems versus intact ecosystems using additional attribute data
   - 4.3 Site versus landscape scale assessments
5. Results
6. Literature Cited
7. Attributes Filter Data Dictionary

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1. CONCEPTUALIZING RESTORATION STRATEGIES

The following excerpts from published documents outline and develop strategies for defining restoration. In general they invoke concepts of the degree of ecosystem impairment versus ecosystem dynamics and therein ecosystem resilience, self-maintenance and ecosystem recovery. These concepts have direct translation to the probability of restoration projects being successful over time. The concept implications are important considerations for managers to implement best-suited restoration strategies depending upon ecosystem conditions and desired restoration outcomes.

Influence of Disturbance (from Johnson et al. 2003)

The success of a restoration project will vary depending on the level of disturbance (anthropomorphic or natural) of the site and the landscape within which the site resides (NRC 1992). Using the findings of the National Research Council and a review of the literature on estuarine habitat restoration, Shreffler and Thom (1993) concluded that the strategies of restoration, enhancement, and creation should be applied depending on the degree of disturbance of the site and the landscape (Figure 2.3). For example, sites with a high degree of disturbance on both scales, in general have a low probability for restoration, and creation of a new habitat or ecosystem or enhancement of selected attributes would be the only viable strategies to apply in

these situations. In contrast, where the site and landscape are essentially intact, restoration to historical (i.e., humans present, but insignificant disturbance) or pre-disturbance (i.e., before man) conditions would be viable options and the probability of success would be high.

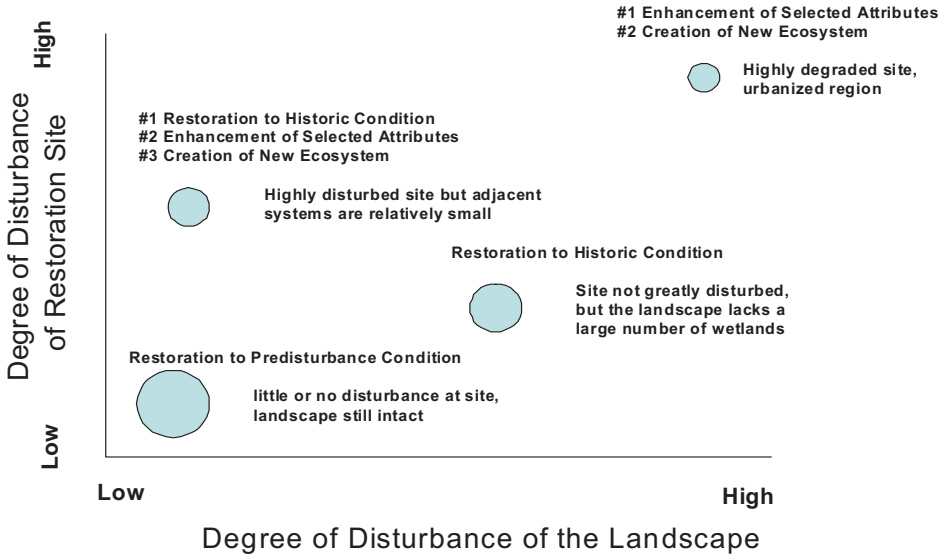

Figure 1. (Johnson et al. 2003 page 19, figure 2.3): Restoration Strategies for Estuarine Systems Relative to Disturbance Levels at the Site and in the Landscape (from Shreffler and Thom 1993). The relative chance of success increases with the size of the dot.

Defining Restoration Strategies (from Johnson et al. 2003)

The above concepts presented in Figure 1 are further defined by Johnson et al. (2003) in regards to restoration strategies.

Table 1. *An Ecosystem-Based Approach to Habitat Restoration in the Columbia River Estuary* Johnson et al. 2003, Table 2.3 (Page 15). Definitions of Restoration[1] Strategies.

Strategy	Definition	Comments
Conservation	Maintenance of biodiversity (Meffe et al. 1994).	Conservation biology is a synthetic field that applies the principles of ecology, biogeography, population genetics, economics, sociology, anthropology, philosophy and other theoretically based disciplines to the maintenance of biological diversity. Conservation can allow development to occur as long as biodiversity and the structure and processes to maintain it are not affected. Restricted development is an approach to conservation.
Creation	Bringing into being a new ecosystem that previously did not exist on the site (NRC 1992).	In contrast to restoration, creation involves the conversion of one habitat type or ecosystem into another.
Enhancement	Any improvement of a structural or functional ecosystem attribute (NRC 1992).	As noted by Lewis (1991), enhancement and restoration are often confused. The intentional alteration of an existing habitat to provide conditions that previously did not exist and which by consensus increase one or more attributes is enhancement. Shreffler and Thom (1993) found that, for estuarine systems, enhancement often meant enhancement of selected attributes of the ecosystem such as improving the quality or size of a tidal marsh or eelgrass meadow.
Restoration	Return of an ecosystem to a close approximation of its previously existing condition (e.g., Lewis 1991, NRC 1992).	Includes any form of restoration with the intent of improving habitat to a state closely approximating a historical or pre-disturbance condition.
Protection	Formal exclusion of activities that may negatively affect the structure and/or functioning of habitats or ecosystems.	Protection can also refer to protection of a species or group of species through management actions such as elimination of harm to a species directly or indirectly through damage of its habitat. Restricted development and land use ordinances can also be used to exclude unwanted activities as an approach to protection.

Strategy Definition Comments

[1] The term "restoration" generally refers to any or all of the five fundamental restoration approaches commonly reported in the literature: creation, enhancement, *restoration*, conservation, and protection. When used to refer specifically to *restoration* as a particular strategy, we will italicize the word; otherwise, assume the usage in the general sense.

No Intervention: In the no intervention approach, recovery is left entirely to natural processes. The outcome of this approach is unpredictable and may not resemble pre-disturbance condition (Class D restoration, Cairns 1991). The two possible trajectories of the no-intervention approach are natural recovery or further degradation. Although represented as two distinct trajectories, further degradation may lead to an alternative steady state, which in turn would progress toward natural recovery. Natural recovery is difficult to grasp because it rarely happens within the lifetime of a scientist or estuary manager and can really only be understood in terms of geological time.

Conservation for Natural Recovery: Conservation can be a practical and effective restoration approach. Conservation biology acknowledges that development of the nearshore and the adjacent upland has and will continue to occur. However, conservation is based on the premise that this development can be done in a way (e.g., using science-based development strategies) to minimize or avoid damage to the biodiversity of the system. Conservation represents a relevant approach for the CRE because there are portions of the system that are highly viable components remaining in the ecosystem, and there will continue to be pressure to develop the region surrounding the system. What is lacking to implement a conservation approach is fundamental information on the relationship between levels and types of development and their impact on biodiversity.

Creation of New Ecosystem: Creation of a new ecosystem involves bringing into being a new ecosystem that previously did not exist on the site (NRC 1992). This approach generally involves "implanting" a created habitat into a coastal shoreline where this type of habitat did not exist previously (Simenstad and Thom 1992). The goal of this approach is to emulate the present condition of an existing, functioning reference ecosystem. Creation of a new ecosystem involves elaborate reconstruction of both physical (e.g., topographic, hydrologic) as well as biotic (e.g., vascular plants) elements. Although created ecosystems may eventually become self-maintaining, there is considerable uncertainty in the outcome. Created ecosystems typically require ongoing management (Class C restoration, Cairns 1991; Simenstad and Thom 1992).

Enhancement of Selected Attributes: Attributes are characteristics that are correlated with and can serve as indicators of ecosystem structure and function. We have adopted the NRC (1992) definition of enhancement to mean any improvement of a structural or functional attribute. The NRC report (1992) highlighted the importance of considering both structural (state) and functional (process) attributes at population, community, ecosystem, and landscape levels as appropriate. In the Pacific Northwest, the Estuarine Habitat Assessment Protocol (Simenstad et al. 1991) was among the first scientific documents to promote an attribute-oriented approach to assessment of restoration, enhancement, and creation of estuarine habitats. Table 2.1 showed a sample list of selected structural and functional attributes for estuarine systems. As noted by Simenstad and Thom (1992), the probability of successful enhancement is greater if we first understand what processes are required to sustain the integrity of the attributes. Enhancement differs from restoration because only one or several attributes are improved rather than the whole system. Estuarine habitat attributes can be integrated as elements of modified habitats of urbanized estuaries and might increase fish and wildlife function despite the fact that they were not operating within the matrix of a natural habitat (Simenstad and Thom 1992).

Restoration to Improved, Pre-Disturbance, or Historical Condition: Intervention through *restoration* is intended to improve the existing condition to any degree. Pre-disturbance condition is the condition thought to have previously existed in the estuary prior to the onset of disturbance. From a practical standpoint, pre-disturbance condition is difficult to define precisely and is commonly referred to in the literature as the original, undisturbed

condition (Jordan et al. 1997; NRC 1992; Cairns 1989). Historic condition is the condition known to have previously existed in the estuary from historic or recent paleoecological research. The goal of *restoration* to historic condition is to establish a community that is ecologically superior to the present degraded system and resembles the original system in certain carefully defined ways (Cairns 1988). Simenstad and Thom (1992) note that the opportunity for successful *restoration* to historic condition is high as long as the primary processes delineating the habitat type are still effective at that site (e.g., salinity intrusion, sedimentation sources and processes, corridors to other natural estuarine and upland habitats). If some, or all, of these processes have been altered or lost, the prospects for *restoration* to historic condition are greatly diminished.

Protection to Maintain a Desirable State: Although indirect, protection can be an effective intervention tool. Protection helps prevent degradation of existing areas that are presently in a desirable ecosystem state. Protection is distinct from conservation because protection assumes no further development, whereas conservation does not.

In general, the above concepts for restoration strategies concern the degree of human disturbance in relation to the site scale versus the respective surrounding landscape scale. Another way to consider the above concepts is through a matrix table developed by Diefenderfer et al. 2007 and presented below in Table 2.

Table 2. Possible restoration strategies indicated by disturbance at site and landscape scales (Diefenderfer et al. 2007 Table 11, adapted from Thom and others 2005a). Level of Disturbance where L = Low, M = Medium and H = High.

		Landscape Scale		
	Level of Disturbance	L	M	H
Site Scale	H	Restore Enhance	Enhance Restore	Create Enhance
	M	Restore Enhance Conserve Preserve	Enhance Restore Conserve	Enhance Create
	L	Conserve Preserve	Conserve Enhance Restore Preserve	Enhance Conserve

2. THE PROBLEM IN DEFINING ECOSYSTEM PROCESSES

Restoration science continues to refine approach concepts that reinforce the importance for "process restoration", where ecosystems are recovered to a functioning self-regulated state through natural ecosystem processes. To illustrate using above text in defining "*restoration*":

> Simenstad and Thom (1992) note that the opportunity for successful *restoration* to historic condition is high as long as the primary processes delineating the habitat type are still effective at that site (e.g., salinity intrusion, sedimentation sources and processes, corridors to other natural estuarine and upland habitats). If some, or all, of these processes have been altered or lost, the prospects for *restoration* to historic condition are greatly diminished.

The above implies process-function links in defining and understanding ecosystem dynamics. A figurative illustration for thinking about ecosystem dynamics is provided by Diefenderfer et al. (2007) and presented below in Figure 2:

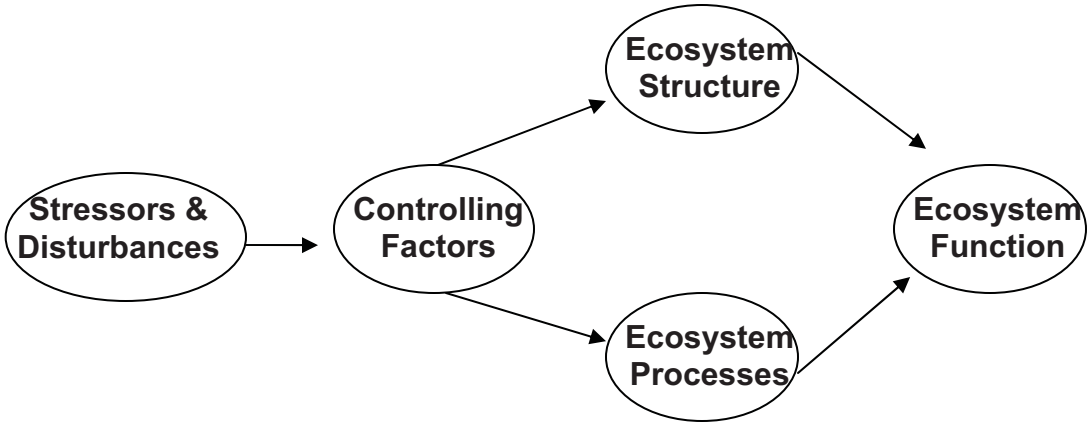

Figure 2. The major categories and structure of a typical conceptual model used in ecosystem analysis (from Diefenderfer et al. 2007).

The above encompasses concepts of disturbance, control factors, ecosystem structure and processes and ultimately ecosystem function as an endpoint. A common approach in defining and understanding ecosystems is through an indicator species of interest. There are numerous instances of these using salmonids which have been argued to be a keystone species. An example of this is provided by Averill et al. (2005):

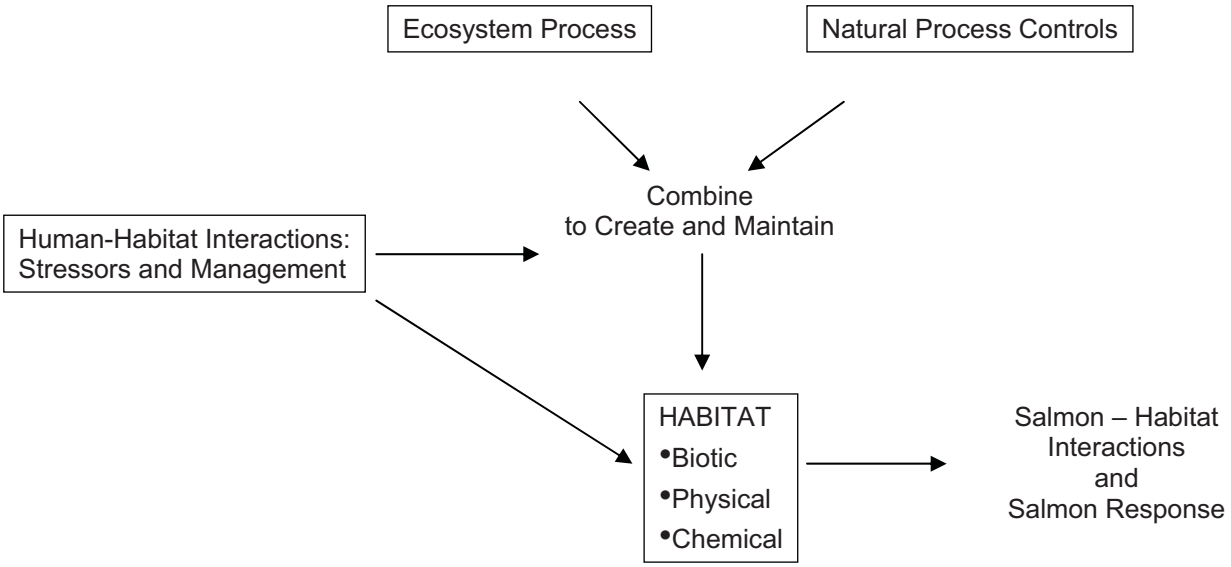

Figure 3. Conceptual model illustrating process-habitat relationships ultimately expressed in terms of salmon populations. From Averill et al. 2005.

In the above figure, the functional response outcome is salmon, which typically equates to population recruitment and production. While the above figurative concepts are insightful, it is more difficult to define and therein select environmental attributes that are most pertinent to achieving desired functional response outcomes. This is further confounded by trying to define ecosystem dynamics at spatial and temporal scales. Stream habitat can reflect influences expressed over several years if not decades whereas food resources in relation to juvenile salmonid production can be considered on an annual temporal scale, within discrete habitat areas. If our primary area of focus is the marine nearshore, more problematic is the influences of entire watershed basin effects in relation to restoration activities only within nearshore environments and how that ultimately equates to salmon population dynamics. Perhaps more problematic is the often touted and ultimate goal of nearshore restoration to recover and maintain natural ecosystem processes, albeit this statement goal is often accompanied with disclaimers that our actual understanding of dynamic ecosystem processes is rather limited.

3. BROAD INDICATORS AND PRIORITIES FOR INTACT ECOSYSTEMS THROUGHOUT THE PUGET SOUND NEARSHORE

A more general consideration of the Puget Sound nearshore can entail identification of attributes and priorities towards creating and maintaining "healthy" nearshore environments. These can be used in subsequent development of approaches for prioritization of restoration strategies. Using the Puget Sound Action Team "Environmental Quality and Economic Vitality, Indicators Report" (2006), indicators and approaches could be categorized as:

Broad Indicators

- Human population
- Land cover and land use (impervious area, forest cover, land use and human density)
- Shoreline armoring
- Shellfish water quality
- Freshwater quality
- Marine water quality

"10 Keys to Preserving Healthy Waters, Healthy Watersheds"

- Preserve forest cover
- Preserve natural drainages
- Preserve riparian areas
- Minimize impervious surface areas
- Limit shoreline armoring
- Prevent pollution
- Manage growth
- Plan for protection
- Rethink stormwater (i.e. low impact development and "soft" stormwater infrastructure)
- Manage wastewater

Although rudimentary, the above items provide general guidelines for defining ecosystem integrity and/or the degree of ecosystem impairment.

4. A COURSE ASSESSMENT SCORING SCHEME FOR PRIORITIZING RESTORATION

Collectively, the above concepts convey coarse constructs by which to consider environmental restoration; however, they also convey the complexities involved in understanding and restoring natural ecosystems. Given this, we chose to develop and apply a tool that could facilitate the identification of restoration areas and therein strategies throughout Budd Inlet, South Puget Sound. Our approach foremost invoked a coarse depiction of current habitat conditions to be subsequently considered in context of broad conceptual restoration strategies (i.e. creation, enhancement, restoration, conservation and protection). This approach was favored on the premise that ecosystem dynamics are inherently complex whereas our understanding of such dynamics is thus far somewhat limited and imperfect.

Focusing on Budd Inlet, it was necessary to first quantitatively define "ecosystem units". The primary ecosystem analysis unit chosen for this project was watershed catchment units defined by the Salmon and Steelhead Habitat Inventory and Assessment Program (SSHIAP, Northwest Indian Fisheries Commission). These are reach scale polygon units that represent the immediate drainage areas based upon channel gradient and confinement as delineated by a 30 meter digital elevation model. Use of the drainage unit ecosystem scale assumes that area delineations are not arbitrary but rather are determined according to existing landform features that discretely encompass a suite of somewhat unique ecosystem processes. This approach allowed us to define analysis units; furthermore, delineated unit polygons can be further defined according to strata. We chose to consider the Budd Inlet environment according to three geographic strata:

1. Upland Catchments (UC), defined as polygon unit catchments that are adjacent to unit catchments that share a marine nearshore border. UC strata units do not directly contribute to shoreline processes *per se*, but have potential influences on marine nearshore dynamics.

2. Nearshore Catchments (NC), defined as polygon unit catchments that include the interface between the terrestrial and marine nearshore environments.

3. Nearshore Zones (NZ) are strata units encompassing up to 200 meters of the shoreline as designated by the SSHIAP analysis. These NZ unit areas were delineated to capture and consider direct nearshore ecosystem processes. It is important to note that NZ units are not necessarily sub-units of respective NC units.

Delineation of three geographic strata by which to consider the Budd Inlet environment allowed for us to examine and compare attribute data at varying scales. Although our focus for this exercise foremost concerned nearshore environments, the three strata delineations allowed for consideration of the marine nearshore environment and potential relationships to the upland terrestrial environment.

4.1. Quantitatively defining impaired versus intact ecosystems – land cover data

We wanted to apply available landscape analysis by which to evaluate ecosystem conditions throughout Budd Inlet. This necessitated the use of information applicable throughout the entire landscape area of interest. Furthermore, our approach had a decided focus on salmon recovery and therein, environmental attributes that favor long-term viability of salmonid populations. We envisioned this exercise as a complimentary tool to similar resources such as the Nearshore Project Selection Tool (2009) for identifying nearshore areas of critical importance for juvenile salmon.

Suitable environmental attribute data was considered and a suite of which was selected for the purposes of characterizing and assessing ecosystem conditions. At the coarse scale the primary attribute data for determining the degree of human impacts (and therein ecosystem integrity) was derived from NOAA C-CAP land cover data (2006); this data allowed for us to quantitatively define the amount of human development (expressed in terms of impervious surface area types) according to the three unit strata types defined for this exercise (i.e. Upland Catchment, Nearshore Catchment and Nearshore Zone, or UC, NC and NZ strata). Our approach premise was that applied landcover data provided quantitative inference to the degree which natural ecosystem functions were impaired; being that such impairments were manifested in the amount removal / loss of natural vegetation cover, alteration of hydrologic regimes, etc.

The *Coastal Change Analysis Program* (C-CAP) is a GIS based dataset produced by the NOAA Coastal Services Center- http://www.csc.noaa.gov/digitalcoast/data/ccapregional/.

The program uses remote sensed imagery to produce a land cover dataset at a 30 meter resolution scale. The goal of the program is to "provide inventories of coastal intertidal areas, wetlands, and adjacent uplands". In this exercise the 2006 C-CAP dataset was used. Available information for Thurston County includes land cover categories for: Development- High Intensity- HID, Medium Intensity- MID, Low Intensity- LID, Open Space Developed- OSD; Vegetated-Grasslands- GRS, Agriculture- AGR, Forested- FOR, Scrub/Shrub- SCB; Wetlands- Woody Wetland- WDW, Emergent Wetland- EMW; Barren Land- BAR; and Open Water- WTR. For the purposes of this analysis land cover data was grouped into the following bins:

Developed-	HID, MID, LID, OSD
Undeveloped-	GRS, AGR, FOR, SCB, BAR
Wetlands-	WDW, EMW
Open water-	WTR

Analysis using the binned C-CAP information was performed for each of the catchment and nearshore zones. Analysis was run with and without the open water WTR attribute. It was initially believed that large lakes present in catchments would skew potential results for level of development. This was not the case except for one small catchment associated with Bigelow Lake in northeast Olympia.

4.2. Quantitatively defining impaired versus intact ecosystems – additional attribute data

We wanted to further refine quantitative assessment of the Budd Inlet environment by selecting available attribute data to be used within a GIS framework. Given our focus for environmental attributes perceived to favor juvenile salmon we correspondingly selected available attribute data previously identified and used for the Nearshore Project Selection Tool (2009); selected attribute data corresponds to the four essential nearshore eco-system functions beneficial to juvenile salmonids described by Simenstad (1982) and William and Thom (2001). The environmental habitat type-attributes identified and mapped included:

- Freshwater streams
- Pocket estuaries
- Marine and freshwater marsh habitats
- Known forage fish spawning beaches
- Inter-tidal vegetation
- Priority nearshore-marine sediment sources

Above attribute data was perceived as 'positive' ecosystem processes / functions, with particular benefits for juvenile salmon. Given that this exercise was intended to identify restoration strategies (i.e. conservation and/or protection) for discrete landscape areas, we also identified attribute data according to areas encompassing 'protected' parcels (e.g. city and county parks, land trust acquisitions, etc.).

We also wanted to assess human-induced 'negative' ecosystem stressors that indicate impairments / alterations to natural ecosystem processes. Besides land cover analysis (discussed previously), 'negative' attribute data entailed consideration of:

- Formally identified impaired waterbodies
- Formally identified toxic sites / facilities
- Nearshore areas altered due to material fill (addition and/or removal)
- Shoreline armoring
- Boat marinas and individual docks and boat launches
- Freshwater point-source outfalls (i.e. sewer, perched stream culverts) to the nearshore-marine environment

Above attribute data was considered according to varying scoring schemes by which to ultimately evaluate ecosystem conditions. Furthermore, the inclusion and consideration of attribute data depended upon analysis strata chosen for this exercise (i.e. UC, NC, and NZ polygon unit strata). In most instances attribute data was considered in terms of a presence / absence tally scoring scheme according to perceived positive (+) ecosystem attributes versus negative (-) ecosystem stressors / alterations. However, for consideration of wetlands, total wetland area respective of a given polygon unit was used. A summary of attribute data, information sources and assessment application respective of polygon strata type is summarized in Table 3.

We wanted to provide an additional quantitative metric to reflect real-world practicalities that land-owner agreements are necessary to accomplish environmental restoration projects. With this objective in-mind, all polygon unit strata type were considered according to the number of parcel ownerships per polygon unit of interest. This approach was favored to indicate the degree of consensus necessary for enacting restoration project activities.

4.3. Site versus landscape scale assessments

Polygon unit strata were also used to evaluate site versus landscape scale relationships. Scale comparisons were done using geographic proximity of polygon catchment units in relation to a given polygon catchment of interest. Within the GIS framework, for a given UC or NC polygon catchment unit, any adjacent polygon catchments sharing a common border were considered "neighbors"; neighbor catchment units were included regardless of whether they were of a UC or NC strata. Considering NZ strata units, adjacent neighbor polygon units were only considered at the NZ strata scale. To evaluate ecosystem conditions at the landscape scale, two quantitative approaches were used:

1. Total land development scores for polygon catchment units adjacent and sharing a common border with a given polygon catchment unit of interest were summed and then averaged by the total number of 'neighbor' polygons. This calculated value indicated the average total land development at the landscape scale respective of site scale (i.e. a given polygon unit of interest).

Table 3. Summary of selected attribute data and associated quantitative scoring methods to assess ecosystem conditions respective of strata polygon catchments, throughout Budd Inlet, South Puget Sound Washington. Defined strata are Upland Catchment (UC), Nearshore Catchment (NC) and Nearshore Zone (NZ).

Strata Consideration	Attribute	Definition	Scoring Scheme	Data Source
POSITIVE (+)				
UC / NC / NZ	Freshwater Streams	Polygon unit containing fluvial freshwater stream(s) / River(s)	+ 0.5 Non-salmon bearing + 1.0 Salmon – bearing +1.5 Tier 1 Salmon-bearing	SSHIAP / WRIA 13 (2009)
UC / NC / NZ	Wetlands	Marine and freshwater wetland areas	Percent unit area per poly catchment unit	NOAA C-CAP (2006)
UC / NC / NZ	Protected Parcel(s)	Areas with formal mandates for preservation and/or conservation including cit and count parks	Present (+1) or Absent (0)	Puget Sound Nearshore Partnership (2009)
NZ	Pocket Estuary	Unique estuarine embayments with freshwater input	Present (+1) or Absent (0)	SSHIAP / WRIA 13 (2009)
NZ	Forage Fish Spawning beach	Nearshore areas with documented forage fish spawning	Present (+1) or Absent (0)	Nearshore Project Selection Tool (2009)
NZ	Intertidal Vegetation	Part of the littoral zone above low-tide mark containing vegetation (seaweed, eelgrass, etc.)	Present (+1) or Absent (0)	Nearshore Project Selection Tool (2009)
NZ	Priority Sediment Source	Areas defined as sediment sources to the marine nearshore interface	Present (+1) or Absent (0)	Thurston County (2005)
NEGATIVE (-)				
UC / NC / NZ	Landcover Type	Impervious surface area type-development	Percent of polygon unit area	NOAA C-CAP (2006)
UC / NC / NZ	303 (d) Category 4 and 5 Listed Waterbodies	Water quality impairment(s) classification	Present (-1) or Absent (0)	Washington Department of Ecology (2010)
UC / NC / NZ	Toxics site / facility	Identified site areas contaminated with toxins of concern	Present (-1) or Absent (0)	Washington Department of Ecology (2010)
NZ	Shoreline Armoring	Nearshore alteration-armoring such as seawalls and revetments	Percentage of NZ catchment unit border	Puget Sound Nearshore Partnership (2009)
NZ	Fill	Addition and / or removal of material in the marine nearshore	Percentage (+/-) of NZ catchment unit area	Puget Sound Nearshore Partnership (2009)
NZ	Marina	Boat basin offering dockage and possible other services for boats	(-1) Small marina classification (-2) Large marina classification	Puget Sound Nearshore Partnership (2009)
NZ	Dock / Launches	Single dock(s) and boat launch(es)	Present (-1) or Absent (0)	Puget Sound Nearshore Partnership (2009)
NZ	Freshwater Outfall	Known marine discharge point source for a sewer system and/or freshwater stream containing a culvert outlet	Present (-1) or Absent (0)	Puget Sound Nearshore Partnership (2009)

2. A second quantitative approach was used to indicate transition areas in terms of total land development. This was calculated by taking the sum of relative differences for total land development between a given polygon unit of interest and each adjacent neighbor polygon. Scores from this approach were interpreted as a relative difference where positive values indicated, in general, a landscape that is less impaired versus a polygon unit of interest, whereas negative scores indicated a surrounding landscape that is relatively more impaired versus a given polygon unit of interest.

The two approaches detailed above were used to provide some inference to site versus landscape scale relationships in terms of the degree of land development and therein the degree of ecosystem integrity / impairment.

5. RESULTS

Assessment data was first considered according to land cover analysis in relation to polygon unit strata type. Throughout the greater Budd Inlet area, a total of 46, 61 and 46 polygon catchment units were defined for Upland Catchments, Nearshore Catchments and Nearshore Zone unit strata type, respectively. Within and between strata unit types, there was considerable variation both in terms of polygon unit area and respective calculated total land development (Figure 4).

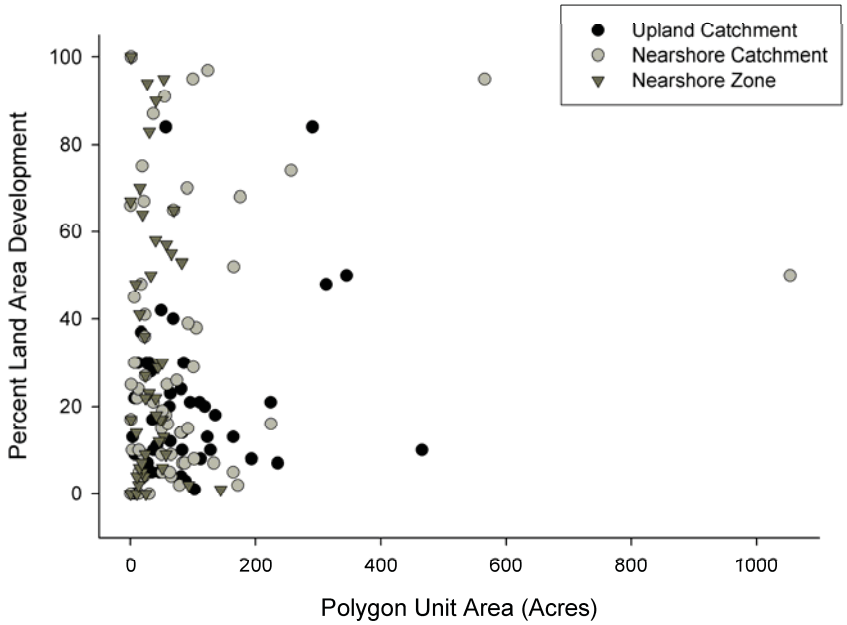

Figure 4. Polygon unit area respective of strata versus percent total land development (NOAA C-CAP 2006) throughout the greater Budd Inlet area, South Puget Sound, Washington.

A geographical depiction of total land development versus individual polygon catchment units reveals, in general, a gradient change with limited development in the north end of Budd Inlet

and increasing land development moving south towards the City of Olympia (Figure 5). A quantitative depiction of this gradient transition in percent land development can be considered using site versus landscape scale calculations. This can first be depicted comparing percent total development versus the summed average of percent total development for polygons adjacent to a given polygon of interest (Figure 6).

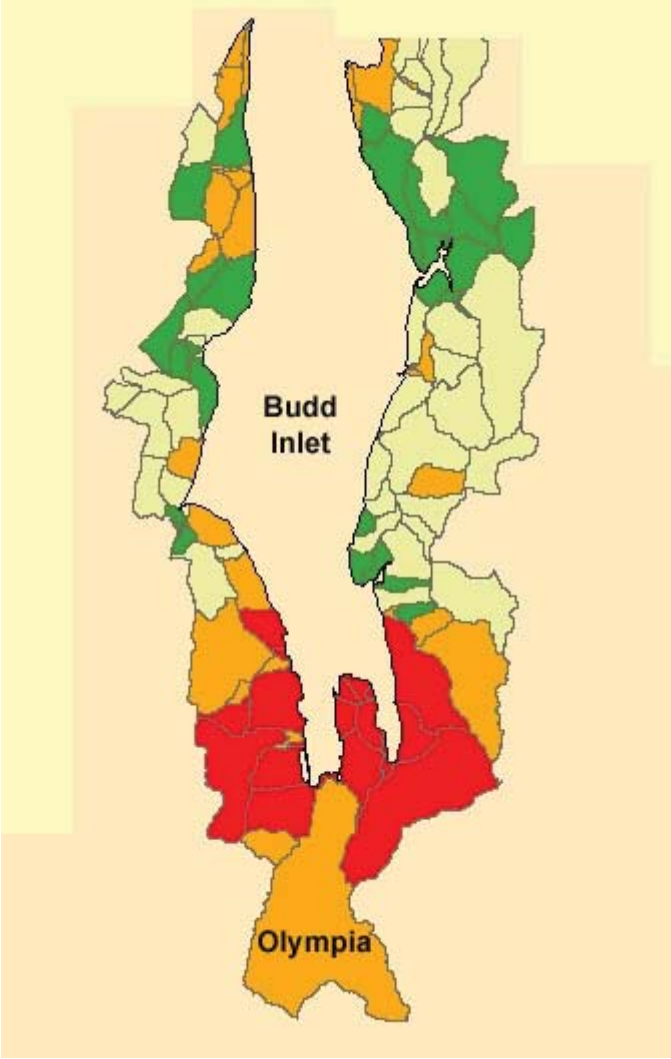

Figure 5. Map of Budd Inlet study area with color shaded depictions of percent cover land development respective of strata area polygons.

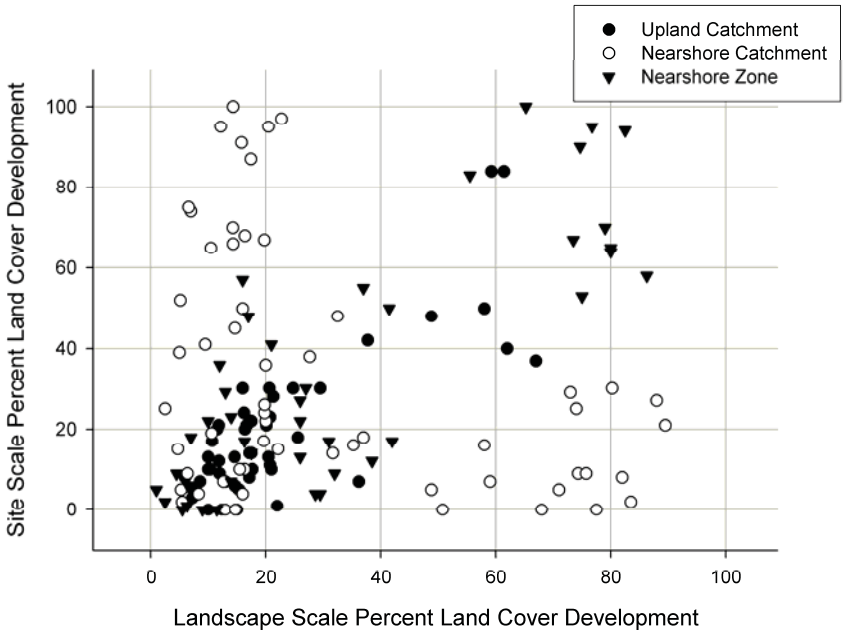

Figure 6. Relationship between total land development at the site scale versus the summed average of total development for polygons areas adjacent to given polygon unit of interest.

To further define transition areas in terms of land cover development, we can consider relative sum differences between a given polygon of interest and adjacent neighboring polygons (Figure 7). Results from this kind of analysis can be used to indicate ecosystem integrity with some inference to ecosystem resilience to human-induced stressors.

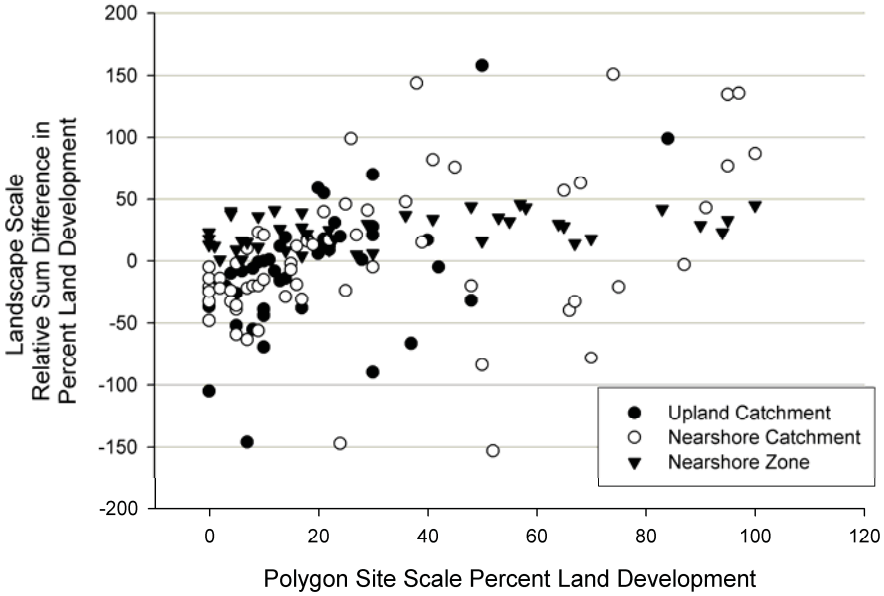

Figure 7. Relationship between total land development at the site unit scale versus the relative summed difference of respective adjacent neighbor polygon units. Positive values on the y-axis indicate landscape conditions with more development as compared to individual polygon units of interest, whereas negative values on the y-axis indicate relative landscape conditions with less development.

Results presented thus far can be used to translate quantitative scores into general restoration strategies. For example, if we consider Figures 6 and 7 and relate these to Table 4, restoration planners can begin to broadly indentify appropriate restoration strategy plans respective of discrete areas.

Table 4. Matrix for identifying restoration strategies determined upon environmental conditions (degree of disturbance) at the landscape versus site scale (Diefenderfer et al. 2007 Table 11, adapted from Thom and others 2005a). Level of Disturbance where L = Low, M = Medium and H = High.

	DISTURBANCE LEVEL	LANDSCAPE SCALE (LS)					
		LOW		MED		HIGH	
SITE SCALE (SS)	HIGH	SS Restore	LS Enhance	SS Enhance	LS Restore	SS Create	LS Enhance
	MED	SS Restore / Enhance	LS Conserve / Preserve	SS Enhance / Restore	LS Conserve	SS Enhance	LS Create
	LOW	SS Preserve / Conserve	LS Preserve / Conserve	SS Conserve / Preserve	LS Restore / Enhance	SS Conserve	LS Enhance

One approach we favored for translating concepts in Table 4 in relation to results from our project exercise was to use ranked quartiles for percent land development both at the site and landscape scale. Color gradients depicted in Figure 5, a geographic map of Budd Inlet, use such quartile scores for percent total land development respective of polygon unit areas.

Our analysis approach also included additional attribute data to further assess ecosystem conditions. One such attribute of perceived importance is the degree of nearshore armoring. Results from this analysis suggest a somewhat inconsistent relationship between the amount of landcover development and degree of shoreline armoring (Figure 8).

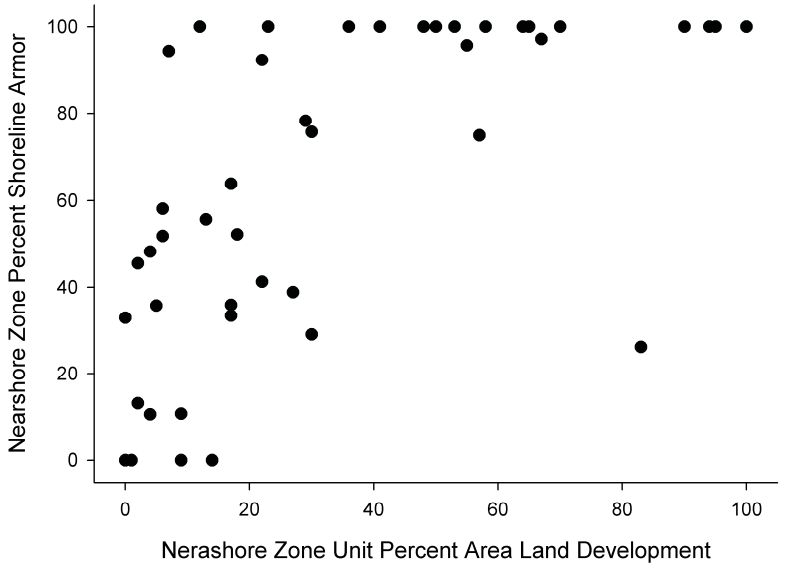

Figure 8. Relationship between percent area of development within nearshore zone polygon units versus the respective amount of shoreline armoring throughout Budd Inlet, South Puget Sound, Washington.

Similar to shoreline armoring analysis, similar quantitative metrics can be evaluated such as the amount area of wetlands present and proportional percent of fill material removed and/or added. Using our assembled GIS dataset, further insight can also be obtained by considering attribute data categorized in the form of positive ecosystem attributes (particularly for juvenile salmon) and ecosystem stressors such as known water quality issues, marinas, etc. Restoration planners can easily evaluate such coarse attribute metrics to infer ecosystem conditions and therein restoration issues and/or opportunities. To illustrate, consideration of compiled data from our project tool could resemble what is presented in Table 5.

Table 5. Conceptual presentation of summary attribute data for determining and prioritizing restoration efforts in Budd Inlet, South Puget Sound, Washington. In this example, the site scale is in a state of 'medium' disturbance whereas the surrounding landscape is relatively undisturbed, or 'low disturbance'.

NZ_Nearshore Zone

Site Scale = medium disturbance
Landscape Scale = low disturbance
Restoration Strategies = Restore / Enhance / Conserve / Preserve

Site Scale
Site Scale
Landscape Scale

Polygon Unit ID	Sum Positive Attributes	Negative Attributes	Rank Size	Parcel per Square Mile	Comments	Potential Project Number ID(s)
1860	4+		27/48	1901	Landscape rank score high (i.e. low development)	24,89,90
1866	3.5+		12/48	501	Landscape rank score high (i.e. low development), 10% wetlands	87
1869	3.5+		40/48	1075	Landscape rank high, 0% shoreline armoring, priority sediment source	43,44
1875	5+	303(d)	7/48	33	Priest Point Park, 0% shoreline armoring	82
1888	1.5+		15/48	1446	Landscape rank score high, 9% wetlands area, 29% shoreline armoring	91
1891	5+	303(d), toxic site	19/48	1109	Landscape rank score high (li.e. low development)	33,34,35,36,48,88
1898	2+		10/48	1163	Landscape rank score high (li.e. low development)	92,93

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7.0 Attributes Filter Data Dictionary

Nearshore Zone (NZ)- zone from Shorezone shoreline inland 200 meters
Nearshore Catchment (NC)- catchments abutting Shorezine shoreline
Upland Catchment (UC)- catchments inland of nearshore catchment

Field name	
UNIT_ID (NZ only)	Nearshore zone identification number (SSHIAP)
Hydro_ID	Contributing catchment identification number (SSHIAP)
Shape_Leng_ft	Length of unit in internal units (feet)

Shape_Area-ft2	Area of unit in internal units (square feet)
Rank_Area	Sequential ranking of area of unit
P_TOT_DEV	NOAA C-CAP development score
RANK_P_TOT-DEV	Sequential ranking of NOAA C-CAP development score
RANK_NBH_TOT_DEV	Sequential ranking of neighboring development score sum
NBH_TOT-DEV	Neighboring units NOAA C-CAP development score sum
P_WET	Percent of unit that is NOAA C-CAP wetlands
RANK_P_WET	Sequential ranking of unit wetland percent

Positive Attributes

PROTECTED	Parcel in unit designated as protected- PSNERP
STREAM	Freshwater stream in unit- SSHIAP
POCKET_EST (NZ only)	Pocket estuary/embayment in unit- SSHIAP
FORAGE_FISH (NZ only)	Documented forage fish spawning- NPST
INT_VEG (NZ only)	Intertidal vegetation present in unit- NPST
PRI_SEDIMENT (NZ only)	Sediment source designated as *priority* in unit- NPST
SUM_POS_ATTR	Sum of positive attributes

Fill and Armor

P_ARM (NZ only)	Linear % of unit modified by shoreline armoring- PSNERP
RANK_P_ARM (NZ only)	Sequential ranking of shoreline armoring percent
FILL (NZ only)	Percent of unit designated as fill- PSNERP

Negative Attributes

ECY_303D	Department of Ecology 303d listed water in unit- WDOE
FACILITY	Department of Ecology toxic cleanup site in unit- WDOE
MARINA (NZ only)	Boat marina present in unit- PSNERP
DOCK_BOAT (NZ only)	Dock or boat mooring present in unit- PSNERP
OUTFALL (NZ only)	Water outfall present in unit- PSNERP
SUM_NEG_ATTR	Sum of negative attributes

DEFINITIONS

Positive Attributes

PROTECTED: Protected parcel

Code:

rating	score
Present	1
Absent	0

STREAM: Stream in unit

Code:

rating	score
Present	1
Absent	0

POCKET_EST: Pocket estuary or embayment in unit

Code:

rating	score
Present	1
Absent	0

FORAGEFISH: Documented forage fish spawning present in unit

Code:

rating	score
Present	1
None	0

INT_VEG: Intertidal vegetation documented in unit

Code:

rating	score
Present	1
Absent	0

PRI_SEDIMENT: Identified priority sediment source in parcel

Code:

rating	score
Present	1
Absent	0

Fill and Armor

P_ARM: Percent of unit that has been modified by shoreline armoring. A value used to weight the unit by multiplying the linear percentage of armoring in the unit by the length of the unit.

Fill: Percent of existing unit that consists of nearshore fill. A value used to weight the unit by multiplying the square feet percentage of fill in the unit by the square feet of the entire unit.

Negative Attributes

ECY_303D: 303d listed waters present as designated by WDOE

Code:

rating	score
Present	1
Absent	0

FACILITY: toxic cleanup site present as designated by WDOE

Code:

rating	score
Present	1
Absent	0

MARINA: Designated boat marina

Code:

rating	score
Present	1
Absent	0

DOCK_BOAT: Designated dock or small boat moorage

Code:

rating	score
Present	1
Absent	0

OUTFALL: Designated water outfall (not stream)

Code:

rating	score
Present	1
Absent	0

Squaxin Island Tribe
Budd Inlet Restoration and Conservation Planning
February 11, 2010
Little Creek Resort Skookum Room

Agenda

Purpose- Produce a strategy that identifies and prioritizes restoration actions and opportunities within Budd Inlet.

Method- Bring together knowledgeable people with diverse expertise for a brain storming, neuron stimulating discussion.

9:00-9:15:	Introductions and meeting purpose.
9:15-9:45:	Review of available maps, research, and assessments.
9:45-12:00	Open discussion on projects, strategies, prioritization etc.
12:00-1:00	Lunch and continuing discussion.
1:00-2:30	Continue discussion and begin mapping strategy.
2:30-3:00	Wrap-up and summarize findings.

Attendees

Paul Cereghino	National Oceanic and Atmospheric Administration
Christina Donehower	People for Puget Sound
Duane Fagergren	Puget Sound Partnership
Doug Myers	People for Puget Sound
Mindy Roberts	Washington Department of Ecology
Hugh Shipman	Washington Department of Ecology
Curtis Tanner	Washington Department of Fish and Wildlife
Jeff Dickison	Squaxin Island Tribe
Levi Keesecker	Squaxin Island Tribe
Scott Steltzner	Squaxin Island Tribe

Meeting Notes

This was a free ranging conversation that covered numerous topics. We have attempted to capture the discussions by themes.

Definition of Budd Inlet-

- The Inlet can be defined as being south of a line from Cooper to Dofflemyer Points.

The Inlet can be further defined by distinct regions-

- Deschutes River Estuary
- East Bay- from Mission Creek mouth south
- West Bay- from the West Bay marina south
- East side- Mission Creek to Boston Harbor
- West side- Marina to Dofflemyer Point

<u>Selected Topics</u>

What makes Budd Inlet unique in South Sound-?

- Comparatively large river system present.
- Counter clockwise gyre through the center of inlet that while not necessarily unique defines a potential zone of river sediment influence.
- Dam is present that has significantly altered the freshwater/marine interaction.
- Substantial loss of estuarine transition habitat area through fill and development.
- Creeks and river discharge strongly affected by most densely urbanized area south of the Everett-Tacoma megapolis.

Sediment

- The Deschutes likely did not provide much course sediment outside of lower Budd Inlet. The Herrera report hypothesizes that the entire west side is sediment starved due to the loss of Deschutes material but provides no plausible method for how large grain sediment could be transported up the inlet.
- Fine grain sediment can be suspended in the water column and may contribute to sedimentation within pocket estuaries.
- Small streams are likely not a significant source of sediment.
- Locally derived bluff material is likely producing most of the open beach sediment, although small streams may contribute some sediment locally.
- Dredged sediment from Capitol Lake may be a valuable resource for local restoration projects that seek to reconstruct marsh elevations where creek mouth systems have been altered by fill.

Sea level rise-

- Not really being studied to quantify effects at the project level.
- City may be able to respond to rising sea level through infrastructure improvements in heavily developed areas – higher seawalls, additional fill, and pumping are widely used in major urban centers already at or below sea level and are not technologically prohibitive. The city should probably avoid expanding urban infrastructure into low-lying areas, as protecting these areas will be expensive and environmentally damaging.
- We should plan now for how we will administratively deal with bulkheads that are damaged or become ineffective in the future.
- A resilient restoration solution considers protection of sediment sources that will allow marsh and beach systems to aggrade in response to sea level rise.

Public access/involvement-

- It is very important to get people down to the water to foster a sense of ownership of the Inlet. This entails more than just providing water views. Governments should not shy away from water access because of pollution concerns. Being faced with pollution signs can really drive home the message that we have a problem. However, water access can be achieved without building substantial park infrastructure to mediate the experience of the shoreline.
- Create watershed districts associated with creek mouths that can be used to link people in the upper watershed with the marine waters by taking responsibility for the quality and quantity of their watershed discharge. Have Stream Team, Shore Stewards or other organizations hold events on the beach that brings in everyone from a particular watershed.
- People can not be forced into restoration. However, when property changes hands or exemption permits are applied for, there is both a social and economic opportunity for improvement over existing conditions.

Small stream mouths and pocket estuaries-

- There are relatively few in the Inlet.
- Research suggests that these can act as biological diversity and water quality hot spots.
- These are logical places to concentrate restoration and conservation efforts.

Water quality-

- Long term monitoring of 0_2 shows continual decline. This mirrors Puget Sound trends but is amplified in Budd Inlet due to urbanization effects.
- LOTT's treatment of waste water for nitrogen is one of the best in the nation but still may not be enough to maintain let alone increase O2 levels.
- The local effect of LOTT's discharge is generally contained to south of Priest Point Park, however nitrogen loading also has a larger scale systemic effect to which LOTT likely contributes

- Hooking up septic households to the city sewer system may have a significant negative impact as water is then pumped out of local watersheds, reducing ground water discharge, and base creek flow and freshwater seep inputs into the nearshore.
- Create incentives and plans in small watersheds to increase the function of natural soil and vegetation systems. The single best measure may be to preserve and replant forest cover.
- Allow LOTT to pay for or mitigate nitrogen discharges by re-vegetating in watersheds, in ways that are proven to effect stream nitrogen inputs
- Consider allowing mussel raft, intensive shellfish culture, or other biological de-nitrification projects in the lower Inlet and study the effects of the rafts on water quality.

Bulkheads/open beaches-

- Very difficult to get land owner buy in. Projects are costly, take a lot of time, and at the individual scale have uncertain ecological benefits. This is not a short term issue.
- Most important action is to stop new shoreline hardening, associated with sediment sources.
- Create demonstration projects of bulkhead removal and soft armoring alternatives.
- Concentrate on demonstration projects on public land, pursue projects of opportunity on large parcels or prioritized sediment sources. An important objective of early beach system actions is to build social and political awareness of sediment starvation issues.
- Due to the relatively low level or armoring and shoreline vegetation, there is an opportunity to use the west side as an example of how we do not want the shorelines in the other inlets to look.
- Use parcel size as a project screen.

Project scope

- Concentrate projects on large reaches and/or large parcel ownership.
- Small projects on small parcels take an inordinate amount of time and resources for little ecological benefit.
- If we are going to do small improvements look for areas and watersheds where the landscape is in relatively good shape. The idea is to improve areas that are in good shape rather then putting our efforts into small projects in areas that are in bad shape.

Olympia oysters-

- Identifiable charismatic species.
- Two populations identified- Priest Point Park and Gull Harbor.
- The environmental conditions that promote growth and settlement, or development of stable high density populations are not known.

Clean up/MTCA sites

- We are not always able to plan for when contaminated fill clean up will occur.
- We can however identify sites where this will occur; where sediment is involved we should include in the clean up plans the creation of pocket estuaries and shelves for marsh to make up for lost habitat.

Regions

Capitol Lake-

- Removal of 5th avenue dam is likely the most important project in the inlet
- Removal of 5th avenue dam is one of the most important restoration projects proposed in Puget Sound
- Sediment from the Deschutes was not likely a significant contributor to the beaches north of west bay due to large grain size. However, the sediment likely maintained shallow marsh habitat in the lower Inlet.
- Clean fill from estuary restoration and subsequent dredges is a valuable resource for creating intertidal benches in appropriate locations in the rest of the Inlet. We should start planning now how and where to use them.
- Management Actions- A. transfer ownership of lake from GA to WDNR; B. remove 5th avenue dam and restore estuary; C. provide dredged sediment to other places in Inlet
- **Short term actions** (10 years)-
    - This region is highly modified with extensive restoration opportunities
    - Transfer management of lake from GA to WDNR.
    - Remove 5th avenue dam and restore estuary.

East Bay-

- East side City and west side is Port.
- Entire shoreline is fill and riprap.
- Entire site was likely a low energy low bank marsh.
- Indian/Moxlie creeks not a significant source of sediment.
- Likely was a low energy marsh that has been filled to have steep banks.
- The size of plants is an issue on east side due to homeowners association.
- Any planted riparian zone would be extremely narrow which may decrease its functionality. A riparian planting demonstration project may be useful in educating the public.
- Pursue innovative sediment based projects, where clean dredge is placed around freshwater inputs to reconstruct marsh elevations likely buried under fill.
- Management Actions- A. use sediment to raise elevations to create marsh and lessen the grade of the shore; B. plant riparian wherever feasible; C. restore Mission Creek estuary; D. create Mission Creek watershed district.

- **Short term actions** (10 years)-
    - This region is highly modified and provides restoration opportunities for educational and public outreach purposes.
    - Restore mouth of Mission Creek.
    - Plant shoreline riparian.
    - Conduct sediment restoration demonstration projects to create marsh habitat. This will provide background on how to deal with funding and permitting issues for sediment and rip-rap issues.
    - Create watershed stewardship district for Mission Creek.
    - Create mussel rafts and Olympia oyster beds to explore de-nitrification. This will provide a background for permitting and disposal issues for similar projects around Puget Sound.

West Bay-

- West side is City and east side is City and Port.
- Deschutes River and a few small streams are present.
- Essentially the entire shoreline is fill and riprap.
- Likely used to be a combination of low energy marsh and Deschutes River channel.
- D.O. issue would be lessened significantly by removal of the 5th avenue dam.
- Extensive parks provide opportunities for public education and chance for citizens to get down to the water.
- Difficult and expensive area to work. Concentrate on opportunistic projects now and wait to piggyback onto improvements projects tied to redevelopment.
- Management Actions- A. Move Yacht Club out of the river's sediment plume; B. use dredged sediment to raise elevations to create marsh shelves; C. Ensure the flushing in Rat Cove is maximized by removing portions of the railroad causeway; D. plant riparian in West Bay Park; E. daylight creek in West Bay Park and plant streamside riparian; F. plan now for future redevelopment projects to maximize shoreline plantings, waterfront trails and public access; G. create Garfield Nature Trail watershed district. Hold events to link home owners in the upper watershed to the creek mouth. Create ways to locally treat stormwater runoff at the source as a demonstration project including restoration of soil and vegetation, construction of swales and other features to increase water filtration and percolation; H. identify clean up sites and create restoration plan for each one so that the cumulative benefits of incremental restoration can be maximized
- **Short term actions** (10 years)-
    - This region is highly modified and provides extensive restoration opportunities.
    - The position relative to downtown and the Westside neighborhood provide opportunities for education and public outreach.
    - Daylight and restore the mouth of the stream at West Bay Park.
    - Create new stream mouth and fix culvert for Schneider Creek.

    - Plant marine and streamside riparian in West Bay Park.
    - Create watershed stewardship district for Garfield Nature Trail watershed. Create stormwater demonstration project that attempts to treat all water onsite in Garfield Creek drainage.
    - Move Olympia Yacht Club.

East Side

- Selected habitat features: open beaches, forage fish spawning, pocket estuaries, two large Olympia oyster reefs at Priest Point Park and in Gull Harbor.
- Relatively few bulkheads.
- Contains the most intact habitat in the Inlet with a couple chunks of land in public ownership.
- Contains relatively long reaches and large parcels where armor removal may be most beneficial and feasible.
- Extensive preservation opportunities and small targeted restoration projects.
- Management Actions: A. protect last remaining parcels in Gull Harbor; B. demonstration bulkhead removal and wood placement at public sites- Burfoot Park, WDNR marine facility and Priest Point Park; C. create a Gull Harbor watershed district to improve water quality in Gull Harbor including culvert replacement. Use this as a model for the rest of the small basins in the Inlet. Plan events that bring homeowners in the watershed to Gull Harbor; D. plant shellfish, specifically Olympia oysters, at Burfoot park to foster public harvest opportunities; E. target the few bulkheads that do exist for removal or softening using parcel size as a screen; F. assist efforts to create Gull Harbor to Woodard Bay corridor.
- **Short term actions** (10 years)-
    - This region is relatively intact with extensive opportunities for preservation and some opportunities for targeted restoration.
    - Create incentives for natural shoreline preservation through county code or public benefit compensation through tax systems.
    - Purchase last remaining parcel in Gull Harbor.
    - Restore Gull Harbor watershed to include remove/replace culverts and re-forest the uplands.
    - Remove bulkheads at Priest Point Park, WDNR marine lab and Burfoot Park.
    - Create restoration plan for WDNR marine lab clean up site.
    - Create watershed stewardship district for Gull Harbor.

West Side

- Selected habitat features: open beaches, forage fish spawning, pocket estuaries
- Extensive bulkheads along most of the shore.
- Few large parcels and little public land to concentrate efforts on.

- Management Actions: A. target Butler Cove for protection and restoration; B. target low energy areas for bulkhead removal at prioritized sediment sites; C. create local tax incentives for bulkhead removal and sediment replacement, as well as maintenance of shoreline vegetation; D. create Butler Cove watershed district. Hold events at the creek mouth that brings in residents from the upper watershed; E. create local tax incentives for bulkhead removal or softening.
- **Short term actions** (10 years)-
    - This region is heavily modified by shoreline armoring. Limited opportunities exist for restoration.
    - Actively pursue restoration opportunities in Butler Cove including planting riparian removal or softening of armored shorelines.
    - Target Butler watershed for upstream restoration.
    - Pursue restoration opportunities at creek mouths and pocket estuaries.
    - Create watershed stewardship district for Butler Cove.

OBJECTID	PROJ_ID	UniqueID	Inlet	UniqueID_1	Unit_ID	Catchmen	Type	Location	ProjectTyp	Source	Notes	Activity
1	1	1	Budd	1	4717		plan	east side	create rest	Budd Inlet	Restoration	restoration
2	2	2	Budd	2	4717		plan	east side	create rest	Budd Inlet	Restoration	restoration
3	3	3	Budd	3	5134		plan	west bay	create rest	Budd Inlet	Restoration	restoration
4	4	4	Budd	4	4345		plan	east side	create rest	Budd Inlet	Restoration	restoration
5	5	5	Budd	5	4345		plan	west side	create rest	Budd Inlet	Restoration	restoration
6	6	6	Budd	6	5050		plan	west bay	create rest	Budd Inlet	Restoration	restoration
7	7	7	Budd	7	5050		plan	west bay	create rest	Budd Inlet	Restoration	restoration
8	8	8	Budd	8	5050		plan	east bay	create rest	Budd Inlet	Restoration	restoration
9	9	9	Budd	9	4812		plan	east bay	create rest	Budd Inlet	Restoration	restoration
10	11	11	Budd	11	4605		plan	east bay	create rest	Budd Inlet	Restoration	restoration
11	12	12	Budd	12	5050		plan	east bay	create rest	Budd Inlet	Restoration	restoration
12	13	13	Budd	13	4419		plan	east bay	create rest	Budd Inlet	Restoration	restoration
13	14	14	Budd	14	4739		plan	east bay	create rest	Budd Inlet	Restoration	restoration
15	16	16	Budd	16	4739		plan	west bay	create rest	Budd Inlet	Restoration	restoration
16	17	17	Budd	17	5118		plan	west bay	create rest	Budd Inlet	Restoration	restoration
18	19	19	Budd	19	4717		plan	west bay	create rest	Budd Inlet	Restoration	restoration
19	20	20	Budd	20	5134		plan	west bay	create rest	Budd Inlet	Restoration	restoration
20	21	21	Budd	21	4917		plan	west bay	create rest	Budd Inlet	Restoration	restoration
21	22	22	Budd	22	5440		plan	west bay	create rest	Budd Inlet	Restoration	restoration
22	23	23	Budd	23	4564		plan	east bay	create rest	Budd Inlet	Restoration	strategy
23	24	24	Budd	24	5177		plan	east side	create rest	Budd Inlet	Restoration	strategy
24	25	25	Budd	25	5108		plan	west bay	create rest	Budd Inlet	Restoration	strategy
25	26	26	Budd	26	4721		plan	west side	create rest	Budd Inlet	Restoration	strategy
26	27	27	Budd	27	4564		plan	east side	create rest	Budd Inlet	Restoration	strategy
27	28	28	Budd	28	4564		plan	east bay	create rest	Budd Inlet	Restoration	strategy
28	29	29	Budd	29	5502		plan	west side	create rest	Budd Inlet	Restoration	strategy
29	30	30	Budd	30	4564		plan	west side	create rest	Budd Inlet	Restoration	strategy
30	31	31	Budd	31	4564		plan	west side	create rest	Budd Inlet	Restoration	strategy
31	32	32	Budd	32	5108		plan	east side	create rest	Budd Inlet	Restoration	strategy
32	33	33	Budd	33	5304		plan	west bay	create rest	Budd Inlet	Restoration	strategy
33	34	34	Budd	34	4303		plan	west bay	create rest	Budd Inlet	Restoration	strategy
34	35	35	Budd	35	5304		group	west bay	create stew	Budd Inlet	Restoration	education
35	36	36	Budd	36	5304		group	west bay	treat storm	Budd Inlet	Restoration	restoration
36	37	37	Budd	37	4828		group	east side	create stew	Budd Inlet	Restoration	education
37	38	38	Budd	38	4828		group	west side	create stew	Budd Inlet	Restoration	education
38	39	39	Budd	39	4879		group	east side	create stew	Budd Inlet	Restoration	education
39	40	40	Budd	40	4879		action	west bay	create inter	Budd Inlet	Restoration	restoration
40	41	41	Budd	41	4400		action	west bay	create inter	Budd Inlet	Restoration	restoration
41	42	42	Budd	42	4400		action	west bay	remove fill	Budd Inlet	Restoration	restoration
42	43	43	Budd	43	5351		action	west bay	remove fill	Budd Inlet	preliminary	restoration
43	44	44	Budd	44	5351		action	west bay	create inter	Budd Inlet	preliminary	restoration
44	45	45	Budd	45	4917		action	east bay	create ripa	Budd Inlet	Restoration	restoration
45	46	46	Budd	46	4739		action	east bay	create inter	Budd Inlet	Restoration	restoration
46	47	47	Budd	47	5641		action	east bay	create inter	Budd Inlet	Restoration	restoration
47	48	48	Budd	48	4303		action	east side	remove fill	Budd Inlet	preliminary	restoration
48	49	49	Budd	49	5635		action	east bay	create ripa	Budd Inlet	Restoration	restoration
49	50	50	Budd	50	4717		action	east bay	create ripa	Budd Inlet	Restoration	restoration
50	51	51	Budd	51	5804		action	east bay	shellfish pl	Budd Inlet	Restoration	research
51	52	52	Budd	52	4211		action	west bay	remove do	Budd Inlet	Restoration	restoration
52	53	53	Budd	53	4211		action	west bay	create inter	Budd Inlet	Restoration	restoration
53	54	54	Budd	54	4739		action	west bay	create inter	Budd Inlet	Restoration	restoration
54	55	55	Budd	55	4211		action	west bay	create ripa	Budd Inlet	Restoration	restoration
55	56	56	Budd	56	4739		action	west bay	replace cul	Budd Inlet	Restoration	restoration
56	57	57	Budd	57	5124		action	east side	create strat	Budd Inlet	Restoration	preservatio
57	58	58	Budd	58	4726		action	east side	bulkhead r	Budd Inlet	Restoration	restoration
58	59	59	Budd	59	4739		action	east side	bulkhead r	Budd Inlet	Restoration	restoration
59	60	60	Budd	60	4739		action	east side	bulkhead r	Budd Inlet	proposed 2	restoration
60	61	61	Budd	61	4659		action	east side	shellfish pl	Budd Inlet	Restoration	research
61	62	62	Budd	62	4659		action	east side	create con	Budd Inlet	planning 2(	preservatio
62	63	63	Budd	63	4857		action	east side	reforestatic	Budd Inlet	Restoration	restoration
63	64	64	Budd	64	0		action	west side	create rest	Budd Inlet	Restoration	restoration
64	65	65	Budd	65	0		action	west side	create ripa	Budd Inlet	Restoration	restoration
65	66	66	Budd	66	0		action	west side	bulkhead r	Budd Inlet	Restoration	restoration
66	67	67	Budd	67	0		action	west side	bulkhead r	Budd Inlet	Restoration	restoration
67	68	68	Budd	68	5093		action	west side	create ripa	Budd Inlet	Restoration	restoration
68	69	69	Budd	69	5842		action	west side	bulkhead r	Budd Inlet	Restoration	restoration
69	70	70	Budd	70	5568		action	west side	create ripa	Budd Inlet	Restoration	restoration
70	71	71	Budd	71	5832		action	west side	bulkhead r	Budd Inlet	Restoration	restoration
71	72	72	Budd	72	5291		action	west side	create ripa	Budd Inlet	Restoration	restoration
72	73	73	Budd	73	5502		action	east side	bulkhead r	Budd Inlet	Restoration	restoration
73	74	74	Budd	74	5134		action	east side	create ripa	Budd Inlet	Restoration	restoration
74	75	75	Budd	75	4659		action	west bay	stream res	Scneider Creek Chanr		restoration

OBJECTID	PROJ_ID	UniqueID	Inlet	UniqueID_1	Unit_ID	Catchmen	Type	Location	ProjectTyp	Source	Notes	Activity
75	76	76	Budd	76	5564		action	west side	remove fill	PSNERP, 2010		restoration
76	77	77	Budd	77	4405		action	west side	replace cul	PSNERP, 2010		restoration
77	78	78	Budd	78	4405		action	west side	remove ove	PSNERP, 2010		restoration
78	79	79	Budd	79	4420		action	east side	bulkhead re	PSNERP, 2020		restoration
79	80	80	Budd	80	5761		action	west side	bulkhead re	PSNERP, 2010		restoration
80	81	81	Budd	81	5761		action	west side	remove ove	PSNERP, 2010		restoration
81	82	82	Budd	82	4262		action	east side	remove fill	PSNERP, 2010		restoration
82	83	83	Budd	83	5502		action	east side	bulkhead re	PSNERP, 2010		restoration
83	84	84	Budd	84	5291		action	west side	bulkhead re	PSNERP, 2010		restoration
84	85	85	Budd	85	5832		action	west side	bulkhead re	PSNERP, 2010		restoration
85	86	86	Budd	86	5832		action	west side	remove ove	PSNERP, 2010		restoration
86	87	87	Budd	87	5123		action	east side	bulkhead re	Thurston County sedin		restoration
87	88	88	Budd	88	4303		action	west side	replace cul	PSNERP, 2010		restoration
88	89	89	Budd	89	5177		action	east side	bulkhead re	Thurston County sedin		restoration
89	90	90	Budd	90	5177		action	east side	bulkhead re	Thurston County sedin		restoration
90	91	91	Budd	91	4893		action	west side	bulkhead re	PSNERP, 2010		restoration
91	92	92	Budd	92	4874		action	west side	bulkhead re	Thurston County sedin		restoration
92	93	93	Budd	93	4874		action	west side	remove ove	PSNERP, 2010		restoration
93	94	94	Budd	94	5335		action	east side	bulkhead re	PSNERP, 2010		restoration
94	95	95	Budd	95	5091		action	west side	bulkhead re	Thurston County sedin		restoration
95	96	96	Budd	96	5877		action	west side	bulkhead re	Thurston County sedin		restoration
96	97	97	Budd	97	5678		action	west side	bulkhead re	Thurston County sediment assess		
97	98	98		98	5678		action	west side	remove do	Thurston County sediment assess		
98	99	99	Budd	99	5302		action	west side	bulkhead re	Thurston County sedin		restoration
99	100	100	Budd	100	5302		action	west side	bulkhead re	Thurston County sedin		restoration
102	101	101	Budd	101	4717		action	west bay	remove fill	PSNERP, 2010		restoration
103	102	102	Budd	102	4717		action	west bay	remove ove	PSNERP, 2010		restoration
104	103	103	Budd	103	4717		action	west bay	bulkhead re	Thurston County sedin		restoration
105	104	104	Budd	104	4717		action	west bay	remove fill	PSNERP, 2010		restoration
106	105	105	Budd	105	4619		action	west bay	remove fill	PSNERP, 2010		restoration
107	106	106	Budd	106	4739		action	west bay	remove ove	PSNERP, 2	Proposed.	restoration
108	107	107	Budd	107	4726		action	west bay	remove ove	PSNERP, 2010		restoration
109	108	108	Budd	108	4605		action	east bay	bulkhead re	Thurston County sedin		restoration
110	109	109	Budd	109	4605		action	east bay	bulkhead re	Thurston County sedin		restoration
111	110	110	Budd	110	4708		action	east side	bulkhead re	Thurston County sedin		restoration

OBJECTID	ProjectDes
1	Gull Harbor- create freshwater restoration plan including assessment of all culverts draining into Gull Harbor.
2	DNR marine lab- create restoration
3	Percival landing- plan for clean-up opportunity toxics
4	Boston Harbor-plan for clean-up opportunity toxics
5	Butler Cove- plan for clean-up opportunity toxics
6	Division Nursery- plan for clean-up opportunity toxics
7	Petroleum Distributers- plan for clean-up opportunity toxics
8	Mission Creek Park- plan for clean-up opportunity toxics
9	East Side Laundry- plan for clean-up opportunity toxics
10	Capitol City Studios- plan for clean-up opportunity toxics
11	Unocal- plan for clean-up opportunity toxics
12	Clarion- plan for clean-up opportunity toxics
13	Warehouse One-plan for clean-up opportunity toxics
15	Cascade Pole- plan for clean-up opportunity toxics
16	Texaco- plan for clean-up opportunity toxics
18	Key Shop- plan for clean-up opportunity toxics
19	Parking Lot- plan for clean-up opportunity toxics
20	8th Street-plan for clean-up opportunity toxics
21	Pho-plan for clean-up opportunity toxics
22	East Bay- restoration and conservation plan
23	East Side- restoration and conservation plan
24	West Bay- restoration and conservation plan
25	West Side- restoration and conservation plan
26	Catchment 5093- restoration and conservation plan
27	Catchment 5842- restoratio and conservation plan
28	Catchment 5568- restoration and conservation plan
29	Catchment 5832- restoration and conservation plan
30	Catchment 5291- restoration and conservation plan
31	Catchment 5502- restoration and conservation plan
32	Catchment 5134- restoration and conservation plan
33	Catchment 4659- restoration and conservation plan
34	Create a Garfield Creek watershed district or association.
35	stormwater demonstration project
36	Gull Harbor watershed district
37	Butler Creek- watershed district
38	Mission Creek watershed district
39	Schnieder Creek- construct new stream mouth and delta saltmarsh.
40	Garfield Creek- construct new stream mouth and delta saltmarsh
41	Garfield Creek- daylight 250 feet of creek through West Bay Park.
42	remove 5th ave dam
43	Create approximately 400,000 square foot freshwater to saltwater/saltmarsh transition zone.
44	Plant along 2,300 linear feet to create a functional riparian zone.
45	Indian/Moxlie- construct new stream mouth and delta saltmarsh.
46	Create approximately 600,000 square foot freshwater to saltwater/saltmarsh transition zone.
47	Mission Creek estuary restoration- remove approximately 6,000 square feet of fill.
48	East Bay drive- plant approximately 1,500 feet of nearshore riparian.
49	Plant approximately 4,200 linear feet along public property to create a functional riparian zone.
50	Add mussel rafts and Olympia oysters beds to test effects of nutrient removal.
51	Move docks and all overwater structures.
52	Create approximately 1,400,000 square foot saltmarsh.
53	Create approximately 320,000 square foot saltmarsh.
54	Plant approximately 2,600 linear feet along public property to create a functional riparian zone.
55	Schneider Creek- replace culvert
56	Gull Harbor- protect remaining parcels
57	Burfoot park- remove 263 foot bulkhead add wood along reach designated as a priority sediment source feeding a forage fish spawning beach.
58	DNR marine lab- remove 160 foot bulkhead add wood along reach designated as a priority sediment source feeding a forage fish spawning beach.
59	Remove 378 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
60	Burfoot park- create Olympia oyster beds
61	Implament Gull Harbor to Woodard Bay corridor plan.
62	Gull Harbor- aggresive reforestation of 7,200,000 square feet of uplands.
63	Butler Creek-create freshwater restoration plan including evaluation of all culverts.
64	Butler Creek- plant 2,400 feet of nearshore to create a functional riparian zone.
65	Butler Creek- remove approximately 400 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
66	Remove or soften 350' of bulkhead add wood. Reach provides sediment to a forage fish spawning beach. Provide tax incentive for soft armoring.
67	Plant 350 feet of nearshore to provide a functioning riparian zone.
68	Remove approximately 200 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
69	Plant 200 feet of nearshore to provide a functioning riparian zone.
70	Remove approximately 200 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
71	Plant 200 feet of nearshore to provide a functioning riparian zone.
72	Remove approximately 290 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
73	Plant 200 feet of nearshore to provide a functioning riparian zone.
74	Schneider Creek- stabilize 3000 feet of channel to prevent erosion.

OBJECTID	ProjectDes
75	remove small eart dam impounding lake
76	remove culvert to allow passage of fish, sediment and wood transport
77	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along sediment transport beach.
78	Remove 475 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
79	Remove or soften 1,500 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
80	Remove overwater structures to prevent grounding, toxic input, and negative shading effects
81	Restore tidal access to Ellis Creek. Replace culvert with a wider design or with a bridge to restore fish, sediment and wood passage.
82	Remove or soften 155 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
83	Remove or soften 275 feet of shoreline armoring and add wood. Site is a depositional sediment source supplying a forage fish spawning beach.
84	Remove or soften 3,100 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
85	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along sediment transport beach.
86	Remove or soften 463 feet of shoreline armoring and add wood. Site is a high priority sediment source supplying a forage fish spawning beach.
87	Remove culvert to allow passage of fish, sediment and wood transport
88	Remove or soften 240 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
89	Remove or soften 265 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
90	Remove or soften 500 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches.
91	Remove or soften 2,000 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
92	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along sediment transport beach.
93	Remove or soften 350 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches.
94	Remove or soften 2,300 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
95	Remove 330 feet of shoreline armoring and add wood. Site is rated as a sediment source supplying a forage fish spawning beach.
96	Remove or soften 865 feet of shoreline armoring and add wood. Unit is a high priority sediment source providing long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline
97	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along high priority sediment transport beach.
98	Remove or soften 500 feet of shoreline armoring and add wood. Unit is a high priority sediment source providing long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline
99	Remove or soften 600 feet of shoreline armoring and add wood. Unit is a high priority sediment source providing long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline
102	Remove 93,000 square feet of nearshore fill.
103	Remove overwater structures to prevent grounding, toxic input, and negative shading effects.
104	Remove or soften 2,300 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
105	Remove 435,000 square feet of nearshore fill.
106	Remove 102,000 square feet of nearshore fill.
107	Move boardwalk structures onto land to prevent grounding, toxic input, and negative shading effects.
108	Remove overwater structures to prevent toxic input and negative shading effects.
109	Remove or soften 1,200 feet of shoreline armoring and add wood. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
110	Remove or soften 754 feet of shoreline armoring add wood. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
111	Remove or soften 600 feet of shoreline armoring and add wood. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.

OBJECTID	PROJ_ID	UniqueID	Inlet	UniqueID_1	Unit_ID	Catchment	Type
26	27	27.00000000000	Budd	27.00000000000	4564.00000000000		plan
31	32	32.00000000000	Budd	32.00000000000	5108.00000000000		plan
45	46	46.00000000000	Budd	46.00000000000	4739.00000000000		plan
46	47	47.00000000000	Budd	47.00000000000	5641.00000000000		plan
47	48	48.00000000000	Budd	48.00000000000	4303.00000000000		plan
48	49	49.00000000000	Budd	49.00000000000	5635.00000000000		plan
49	50	50.00000000000	Budd	50.00000000000	4717.00000000000		plan
50	51	51.00000000000	Budd	51.00000000000	5804.00000000000		plan
51	52	52.00000000000	Budd	52.00000000000	4211.00000000000		plan
52	53	53.00000000000	Budd	53.00000000000	4211.00000000000		plan
53	54	54.00000000000	Budd	54.00000000000	4739.00000000000		plan
54	55	55.00000000000	Budd	55.00000000000	4211.00000000000		plan
55	56	56.00000000000	Budd	56.00000000000	4739.00000000000		plan
56	57	57.00000000000	Budd	57.00000000000	5124.00000000000		plan
57	58	58.00000000000	Budd	58.00000000000	4726.00000000000		plan
58	59	59.00000000000	Budd	59.00000000000	4739.00000000000		plan
59	60	60.00000000000	Budd	60.00000000000	4739.00000000000		plan
60	61	61.00000000000	Budd	61.00000000000	4659.00000000000		plan
61	62	62.00000000000	Budd	62.00000000000	4659.00000000000		plan
63	64	64.00000000000	Budd	64.00000000000	0.00000000000		plan
64	65	65.00000000000	Budd	65.00000000000	0.00000000000		plan
65	66	66.00000000000	Budd	66.00000000000	0.00000000000		plan
66	67	67.00000000000	Budd	67.00000000000	0.00000000000		plan
67	68	68.00000000000	Budd	68.00000000000	5093.00000000000		plan
68	69	69.00000000000	Budd	69.00000000000	5842.00000000000		plan
69	70	70.00000000000	Budd	70.00000000000	5568.00000000000		plan
70	71	71.00000000000	Budd	71.00000000000	5832.00000000000		plan
71	72	72.00000000000	Budd	72.00000000000	5291.00000000000		plan
72	73	73.00000000000	Budd	73.00000000000	5502.00000000000		plan
73	74	74.00000000000	Budd	74.00000000000	5134.00000000000		plan
74	75	75.00000000000	Budd	75.00000000000	4659.00000000000		plan

Location	ProjectTyp
east side	create restoration plan
east side	create restoration plan
west bay	create restoration plan
east side	create restoration plan
west side	create restoration plan
west bay	create restoration plan
west bay	create restoration plan
east bay	create restoration plan
east bay	create restoration plan
east bay	create restoration plan
east bay	create restoration plan
east bay	create restoration plan
east bay	create restoration plan
west bay	create restoration plan
west bay	create restoration plan
west bay	create restoration plan
west bay	create restoration plan
west bay	create restoration plan
west bay	create restoration plan
east bay	create restoration and conservation strategy
east side	create restoration and conservation strategy
west bay	create restoration and conservation strategy
west side	create restoration and conservation strategy
east side	create restoration and conservation strategy
east bay	create restoration and conservation strategy
west side	create restoration and conservation strategy
west side	create restoration and conservation strategy
west side	create restoration and conservation strategy
east side	create restoration and conservation strategy
west bay	create restoration and conservation strategy
west bay	create restoration and conservation strategy

Source	Notes	Activity
Budd Inlet Restoration and Conservation Planning, 2010		restoration
Budd Inlet Restoration and Conservation Planning, 2010		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010; WDOE toxics cleanup program		restoration
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy
Budd Inlet Restoration and Conservation Planning, 2010		strategy

ProjectDes
Gull Harbor- create freshwater restoration plan including assessment of all culverts draining into Gull Harbor.
DNR marine lab- create restoration
Percival landing- plan for clean-up opportunity toxics
Boston Harbor-plan for clean-up opportunity toxics
Butler Cove- plan for clean-up opportunity toxics
Division Nursery- plan for clean-up opportunity toxics
Petroleum Distributers- plan for clean-up opportunity toxics
Mission Creek Park- plan for clean-up opportunity toxics
East Side Laundry- plan for clean-up opportunity toxics
Capitol City Studios- plan for clean-up opportunity toxics
Unocal- plan for clean-up opportunity toxics
Clarion- plan for clean-up opportunity toxics
Warehouse One-plan for clean-up opportunity toxics
Cascade Pole- plan for clean-up opportunity toxics
Texaco- plan for clean-up opportunity toxics
Key Shop- plan for clean-up opportunity toxics
Parking Lot- plan for clean-up opportunity toxics
8th Street-plan for clean-up opportunity toxics
Pho-plan for clean-up opportunity toxics
East Bay- restoration and conservation plan
East Side- restoration and conservation plan
West Bay- restoration and conservation plan
West Side- restoration and conservation plan
Catchment 5093- restoration and conservation plan
Catchment 5842- restoratio and conservation plan
Catchment 5568- restoration and conservation plan
Catchment 5832- restoration and conservation plan
Catchment 5291- restoration and conservation plan
Catchment 5502- restoration and conservation plan
Catchment 5134- restoration and conservation plan
Catchment 4659- restoration and conservation plan

OBJECTID	PROJ_ID	UniqueID	Inlet	UniqueID_1	Unit_ID	Catchment Type
19	20	20.00000000000	Budd	20.00000000000	5134.00000000000	group
21	22	22.00000000000	Budd	22.00000000000	5440.00000000000	group
27	28	28.00000000000	Budd	28.00000000000	4564.00000000000	group
32	33	33.00000000000	Budd	33.00000000000	5304.00000000000	group
62	63	63.00000000000	Budd	63.00000000000	4857.00000000000	group

Location	ProjectTyp	Source	Notes
west bay	create stewardship district	Budd Inlet Restoration and Conservation Planning, 2010	
west bay	treat stormwater	Budd Inlet Restoration and Conservation Planning, 2010	
east side	create stewardship district	Budd Inlet Restoration and Conservation Planning, 2010	
west side	create stewardship district	Budd Inlet Restoration and Conservation Planning, 2010	
east side	create stewardship district	Budd Inlet Restoration and Conservation Planning, 2010	

Activity	ProjectDes
education	Create a Garfield Creek watershed district or association.
restoration	stormwater demonstration project
education	Gull Harbor watershed district
education	Butler Creek- watershed district
education	Mission Creek watershed district

OBJECTID	PROJ_ID	UniqueID	Inlet	UniqueID_1	Unit_ID	Catchment	Type	Location	ProjectTyp
1	1	1.00000000000	Budd	1.00000000000	4717.00000000000		action	west bay	create intertidal bench
2	2	2.00000000000	Budd	2.00000000000	4717.00000000000		action	west bay	create intertidal bench
3	3	3.00000000000	Budd	3.00000000000	5134.00000000000		action	west bay	remove fill
4	4	4.00000000000	Budd	4.00000000000	4345.00000000000		action	west bay	remove fill
5	5	5.00000000000	Budd	5.00000000000	4345.00000000000		action	west bay	create intertidal bench
6	6	6.00000000000	Budd	6.00000000000	5050.00000000000		action	east bay	create riparian
7	7	7.00000000000	Budd	7.00000000000	5050.00000000000		action	east bay	create intertidal bench
8	8	8.00000000000	Budd	8.00000000000	5050.00000000000		action	east bay	create intertidal bench
9	9	9.00000000000	Budd	9.00000000000	4812.00000000000		action	east side	remove fill
10	11	11.00000000000	Budd	11.00000000000	4605.00000000000		action	east bay	create riparian
11	12	12.00000000000	Budd	12.00000000000	5050.00000000000		action	east bay	create riparian
12	13	13.00000000000	Budd	13.00000000000	4419.00000000000		action	east bay	shellfish planting
13	14	14.00000000000	Budd	14.00000000000	4739.00000000000		action	west bay	remove docks and pilings
15	16	16.00000000000	Budd	16.00000000000	4739.00000000000		action	west bay	create intertidal bench
16	17	17.00000000000	Budd	17.00000000000	5118.00000000000		action	west bay	create intertidal bench
18	19	19.00000000000	Budd	19.00000000000	4717.00000000000		action	west bay	create riparian
20	21	21.00000000000	Budd	21.00000000000	4917.00000000000		action	west bay	replace culvert
22	23	23.00000000000	Budd	23.00000000000	4564.00000000000		action	east side	create strategy
23	24	24.00000000000	Budd	24.00000000000	5177.00000000000		action	east side	bulkhead removal
24	25	25.00000000000	Budd	25.00000000000	5108.00000000000		action	east side	bulkhead removal
25	26	26.00000000000	Budd	26.00000000000	4721.00000000000		action	east side	bulkhead removal
28	29	29.00000000000	Budd	29.00000000000	5502.00000000000		action	east side	shellfish planting
29	30	30.00000000000	Budd	30.00000000000	4564.00000000000		action	east side	create connecting corridor
30	31	31.00000000000	Budd	31.00000000000	4564.00000000000		action	east side	reforestation
33	34	34.00000000000	Budd	34.00000000000	4303.00000000000		action	west side	create restoration plan
34	35	35.00000000000	Budd	35.00000000000	5304.00000000000		action	west side	create riparian
35	36	36.00000000000	Budd	36.00000000000	5304.00000000000		action	west side	bulkhead removal
36	37	37.00000000000	Budd	37.00000000000	4828.00000000000		action	west side	bulkhead removal
37	38	38.00000000000	Budd	38.00000000000	4828.00000000000		action	west side	create riparian
38	39	39.00000000000	Budd	39.00000000000	4879.00000000000		action	west side	bulkhead removal
39	40	40.00000000000	Budd	40.00000000000	4879.00000000000		action	west side	create riparian
40	41	41.00000000000	Budd	41.00000000000	4400.00000000000		action	west side	bulkhead removal
41	42	42.00000000000	Budd	42.00000000000	4400.00000000000		action	west side	create riparian
42	43	43.00000000000	Budd	43.00000000000	5351.00000000000		action	east side	bulkhead removal
43	44	44.00000000000	Budd	44.00000000000	5351.00000000000		action	east side	create riparian
44	45	45.00000000000	Budd	45.00000000000	4917.00000000000		action	west bay	stream restoration
75	76	76.00000000000	Budd	76.00000000000	5564.00000000000		action	west side	remove fill
76	77	77.00000000000	Budd	77.00000000000	4405.00000000000		action	west side	replace culvert
77	78	78.00000000000	Budd	78.00000000000	4405.00000000000		action	west side	remove overwater structures
78	79	79.00000000000	Budd	79.00000000000	4420.00000000000		action	east side	bulkhead removal
79	80	80.00000000000	Budd	80.00000000000	5761.00000000000		action	west side	bulkhead removal
80	81	81.00000000000	Budd	81.00000000000	5761.00000000000		action	west side	remove overwater structures
81	82	82.00000000000	Budd	82.00000000000	4262.00000000000		action	east side	remove fill
82	83	83.00000000000	Budd	83.00000000000	5502.00000000000		action	east side	bulkhead removal
83	84	84.00000000000	Budd	84.00000000000	5291.00000000000		action	west side	bulkhead removal

OBJECTID	PROJ_ID	UniqueID	Inlet	UniqueID_1	Unit_ID	Catchment	Type	Location	ProjectTyp
84	85	85.00000000000	Budd	85.00000000000	5832.00000000000		action	west side	bulkhead removal
85	86	86.00000000000	Budd	86.00000000000	5832.00000000000		action	west side	remove overwater structures
86	87	87.00000000000	Budd	87.00000000000	5123.00000000000		action	east side	bulkhead removal
87	88	88.00000000000	Budd	88.00000000000	4303.00000000000		action	west side	replace culvert
88	89	89.00000000000	Budd	89.00000000000	5177.00000000000		action	east side	bulkhead removal
89	90	90.00000000000	Budd	90.00000000000	5177.00000000000		action	east side	bulkhead removal
90	91	91.00000000000	Budd	91.00000000000	4893.00000000000		action	west side	bulkhead removal
91	92	92.00000000000	Budd	92.00000000000	4874.00000000000		action	west side	bulkhead removal
92	93	93.00000000000	Budd	93.00000000000	4874.00000000000		action	west side	remove overwater structures
93	94	94.00000000000	Budd	94.00000000000	5335.00000000000		action	east side	bulkhead removal
94	95	95.00000000000	Budd	95.00000000000	5091.00000000000		action	west side	bulkhead removal
95	96	96.00000000000	Budd	96.00000000000	5877.00000000000		action	west side	bulkhead removal
96	97	97.00000000000	Budd	97.00000000000	5678.00000000000		action	west side	bulkhead removal
97	98	98.00000000000		98.00000000000	5678.00000000000		action	west side	remove docks and pilings
98	99	99.00000000000	Budd	99.00000000000	5302.00000000000		action	west side	bulkhead removal
99	100	100.00000000000	Budd	100.00000000000	5302.00000000000		action	west side	bulkhead removal
102	101	101.00000000000	Budd	101.00000000000	4717.00000000000		action	west bay	remove fill
103	102	102.00000000000	Budd	102.00000000000	4717.00000000000		action	west bay	remove overwater structures
104	103	103.00000000000	Budd	103.00000000000	4717.00000000000		action	west bay	bulkhead removal
105	104	104.00000000000	Budd	104.00000000000	4717.00000000000		action	west bay	remove fill
106	105	105.00000000000	Budd	105.00000000000	4619.00000000000		action	west bay	remove fill
107	106	106.00000000000	Budd	106.00000000000	4739.00000000000		action	west bay	remove overwater structures
108	107	107.00000000000	Budd	107.00000000000	4726.00000000000		action	west bay	remove overwater structures
109	108	108.00000000000	Budd	108.00000000000	4605.00000000000		action	east bay	bulkhead removal
110	109	109.00000000000	Budd	109.00000000000	4605.00000000000		action	east bay	bulkhead removal
111	110	110.00000000000	Budd	110.00000000000	4708.00000000000		action	east side	bulkhead removal

OBJECTID	Source	Notes	Activity
1	Budd Inlet Restoration and Conservation Planning, 2010		restoration
2	Budd Inlet Restoration and Conservation Planning, 2010		restoration
3	Budd Inlet Restoration and Conservation Planning, 2010		restoration
4	Budd Inlet Restoration and Conservation Planning, 2010	preliminary assessments done	restoration
5	Budd Inlet Restoration and Conservation Planning, 2010	preliminary assessments done	restoration
6	Budd Inlet Restoration and Conservation Planning, 2010. Revegetation Plan for the Eastern Shore of East Bay, 1996. East Bay Habitat Enhancment Plan, 1994.		restoration
7	Budd Inlet Restoration and Conservation Planning, 2010. Revegetation Plan for the Eastern Shore of East Bay, 1996. East Bay Habitat Enhancment Plan, 1994.		restoration
8	Budd Inlet Restoration and Conservation Planning, 2010. Revegetation Plan for the Eastern Shore of East Bay, 1996. East Bay Habitat Enhancment Plan, 1994.		restoration
9	Budd Inlet Restoration and Conservation Planning, 2010	preliminary assessments done	restoration
10	Budd Inlet Restoration and Conservation Planning, 2010		restoration
11	Budd Inlet Restoration and Conservation Planning, 2010		restoration
12	Budd Inlet Restoration and Conservation Planning, 2010		research
13	Budd Inlet Restoration and Conservation Planning, 2010		restoration
15	Budd Inlet Restoration and Conservation Planning, 2010		restoration
16	Budd Inlet Restoration and Conservation Planning, 2010		restoration
18	Budd Inlet Restoration and Conservation Planning, 2010		restoration
20	Budd Inlet Restoration and Conservation Planning, 2010		restoration
22	Budd Inlet Restoration and Conservation Planning, 2010		preservation
23	Budd Inlet Restoration and Conservation Planning, 2010		restoration
24	Budd Inlet Restoration and Conservation Planning, 2010		restoration
25	Budd Inlet Restoration and Conservation Planning, 2010	proposed 2010	restoration
28	Budd Inlet Restoration and Conservation Planning, 2010		research
29	Budd Inlet Restoration and Conservation Planning, 2010	planning 2010	preservation
30	Budd Inlet Restoration and Conservation Planning, 2010		restoration
33	Budd Inlet Restoration and Conservation Planning, 2010		restoration
34	Budd Inlet Restoration and Conservation Planning, 2010		restoration
35	Budd Inlet Restoration and Conservation Planning, 2010		restoration
36	Budd Inlet Restoration and Conservation Planning, 2010		restoration
37	Budd Inlet Restoration and Conservation Planning, 2010		restoration
38	Budd Inlet Restoration and Conservation Planning, 2010		restoration
39	Budd Inlet Restoration and Conservation Planning, 2010		restoration
40	Budd Inlet Restoration and Conservation Planning, 2010		restoration
41	Budd Inlet Restoration and Conservation Planning, 2010		restoration
42	Budd Inlet Restoration and Conservation Planning, 2010		restoration
43	Budd Inlet Restoration and Conservation Planning, 2010		restoration
44	Scneider Creek Channel Stabilization Project. City of Olympia, 1995. Basin Reconnaissance and Public Involvment Report,City of Olympia and WDOE, 1993		restoration
75	PSNERP, 2010		restoration
76	PSNERP, 2010		restoration
77	PSNERP, 2010		restoration
78	PSNERP, 2020		restoration
79	PSNERP, 2010		restoration
80	PSNERP, 2010		restoration
81	PSNERP, 2010		restoration
82	PSNERP, 2010		restoration
83	PSNERP, 2010		restoration

OBJECTID	Source	Notes	Activity
84	PSNERP, 2010		restoration
85	PSNERP, 2010		restoration
86	Thurston County sediment assessment, 2005		restoration
87	PSNERP, 2010		restoration
88	Thurston County sediment assessment, 2005		restoration
89	Thurston County sediment assessment, 2005		restoration
90	PSNERP, 2010		restoration
91	Thurston County sediment assessment, 2005		restoration
92	PSNERP, 2010		restoration
93	PSNERP, 2010		restoration
94	Thurston County sediment assessment, 2005		restoration
95	Thurston County sediment assessment, 2005		restoration
96	Thurston County sediment assessment, 2005		
97	Thurston County sediment assessment, 2005		
98	Thurston County sediment assessment, 2005		restoration
99	Thurston County sediment assessment, 2005		restoration
102	PSNERP, 2010		restoration
103	PSNERP, 2010		restoration
104	Thurston County sediment assessment, 2005		restoration
105	PSNERP, 2010		restoration
106	PSNERP, 2010		restoration
107	PSNERP, 2010	Proposed. Some design done.	restoration
108	PSNERP, 2010		restoration
109	Thurston County sediment assessment, 2005		restoration
110	Thurston County sediment assessment, 2005		restoration
111	Thurston County sediment assessment, 2005		restoration

OBJECTID	ProjectDes
1	Schnieder Creek- construct new stream mouth and delta saltmarsh.
2	Garfield Creek- construct new stream mouth and delta saltmarsh
3	Garfield Creek- daylight 250 feet of creek through West Bay Park.
4	remove 5th ave dam
5	Create approximately 400,000 square foot freshwater to saltwater/saltmarsh transition zone.
6	Plant along 2,300 linear feet to create a functional riparian zone.
7	Indian/Moxlie- construct new stream mouth and delta saltmarsh.
8	Create approximately 600,000 square foot freshwater to saltwater/saltmarsh transition zone.
9	Mission Creek estuary restoration- remove approximately 6,000 square feet of fill.
10	East Bay drive- plant approximately 1,500 feet of nearshore riparian.
11	Plant approximately 4,200 linear feet along public property to create a functional riparian zone.
12	Add mussel rafts and Olympia oysters beds to test effects of nutrient removal.
13	Move docks and all overwater structures.
15	Create approximately 1,400,000 square foot saltmarsh.
16	Create approximately 320,000 square foot saltmarsh.
18	Plant approximately 2,600 linear feet along public property to create a functional riparian zone.
20	Schneider Creek- replace culvert
22	Gull Harbor- protect remaining parcels
23	Burfoot park- remove 263 foot bulkhead add wood along reach designated as a priority sediment source feeding a forage fish spawning beach.
24	DNR marine lab- remove 160 foot bulkhead add wood along reach designated as a priority sediment source feeding a forage fish spawning beach.
25	Remove 378 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
28	Burfoot park- create Olympia oyster beds
29	Implament Gull Harbor to Woodard Bay corridor plan.
30	Gull Harbor- aggresive reforestation of 7,200,000 square feet of uplands.
33	Butler Creek-create freshwater restoration plan including evaluation of all culverts.
34	Butler Creek- plant 2,400 feet of nearshore to create a functional riparian zone.
35	Butler Creek- remove approximately 400 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
36	Remove or soften 350' of bulkhead add wood. Reach provides sediment to a forage fish spawning beach. Provide tax incentive for soft armoring.
37	Plant 350 feet of nearshore to provide a functioning riparian zone.
38	Remove approximately 200 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
39	Plant 200 feet of nearshore to provide a functioning riparian zone.
40	Remove approximately 200 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
41	Plant 200 feet of nearshore to provide a functioning riparian zone.
42	Remove approximately 290 feet of bulkhead and add wood. Reach is a priority sediment source feeding a forage fish spawning beach.
43	Plant 200 feet of nearshore to provide a functioning riparian zone.
44	Schneider Creek- stabilize 3000 feet of channel to prevent erosion.
75	remove small eart dam impounding lake
76	remove culvert to allow passage of fish, sediment and wood transport
77	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along sediment transport beach.
78	Remove 475 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
79	Remove or soften 1,500 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
80	Remove overwater structures to prevent grounding, toxic input, and negative shading effects
81	Restore tidal access to Ellis Creek. Replace culvert with a wider design or with a bridge to restore fish, sediment and wood passage.
82	Remove or soften 155 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
83	Remove or soften 275 feet of shoreline armoring and add wood. Site is a depositional sediment source supplying a forage fish spawning beach.

OBJECTID	ProjectDes
84	Remove or soften 3,100 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
85	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along sediment transport beach.
86	Remove or soften 463 feet of shoreline armoring and add wood. Site is a high priority sediment source supplying a forage fish spawning beach.
87	Remove culvert to allow passage of fish, sediment and wood transport
88	Remove or soften 240 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
89	Remove or soften 265 feet of shoreline armoring and add wood. Site is rated as a priority sediment source supplying a forage fish spawning beach.
90	Remove or soften 500 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches.
91	Remove or soften 2,000 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
92	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along sediment transport beach.
93	Remove or soften 350 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches.
94	Remove or soften 2,300 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
95	Remove 330 feet of shoreline armoring and add wood. Site is rated as a sediment source supplying a forage fish spawning beach.
96	Remove or soften 865 feet of shoreline armoring and add wood. Unit is a high priority sediment source providing long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline
97	Remove overwater structures to prevent grounding, toxic input, and negative shading effects along high priority sediment transport beach.
98	Remove or soften 500 feet of shoreline armoring and add wood. Unit is a high priority sediment source providing long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline
99	Remove or soften 600 feet of shoreline armoring and add wood. Unit is a high priority sediment source providing long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline
102	Remove 93,000 square feet of nearshore fill.
103	Remove overwater structures to prevent grounding, toxic input, and negative shading effects.
104	Remove or soften 2,300 feet of shoreline armoring and add wood. Unit provides long shore drift for forage fish spawning beaches. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
105	Remove 435,000 square feet of nearshore fill.
106	Remove 102,000 square feet of nearshore fill.
107	Move boardwalk structures onto land to prevent grounding, toxic input, and negative shading effects.
108	Remove overwater structures to prevent toxic input and negative shading effects.
109	Remove or soften 1,200 feet of shoreline armoring and add wood. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
110	Remove or soften 754 feet of shoreline armoring add wood. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.
111	Remove or soften 600 feet of shoreline armoring and add wood. Add sediment to maintain and then build beach profile. Provide tax incentives for shoreline softening.

NZ_Nearshore Zone

Site Scale = low disturbance
Landscape Scale = low disturbance

Conserve / Preserve

Site Scale
Landscape Scale

Unit ID	Pos Atr	Neg Atr	Rank Size	Parcel/ Sq mile	Comments	Project Number(s)
1862	2.5+		2/48	276	#1 nhbr low score tie, wetlands rank high, low armor	65
1863	5+	303D	1/48	133	nhbr score almost medium, wetlands rank high, low armor	23,28,27,31,77,78
1872	2.5+		32/48	694	development score almost medium	79
1873	3+		37/48	782	#1 nhbr low score tie, wetlands rank high	26
1894	3.5+		11/48	514	#1 nhbr low score tie; development score almost medium	80,81

NZ_Nearshore Zone

Site Scale = low disturbance **Conserve/Enhance/Restore/Preserve**
Landscape Scale = medium disturbance

Site Scale
Landscape Scale
Landscape Scale

Unit ID	Pos Atr	Neg Atr	Rank Size	Parcel/ Sq mile	Comments	Project Number(s)
1864	3.5+		46/48	2492	Gull Harbor spit, #1 development score tie, low armor	
1865	3.5+		44/48	1124	Gull Harbor spit, #1 development score tie, wetlands rank high (#1), low armor	
1871	2.5+		38/48	571	#1 development score tie, low armor	
1874	2+		25/48	26	Priest Point Park;#1 development score tie, wetlands rank high, low armor	
1893	3.5+		36/48	836	development score almost medium	41,42

NZ_Nearshore Zone

Site Scale = low disturbance **Enhance/Conserve**
Landscape Scale = high disturbance

Site Scale
Landscape Scale

Unit ID	Pos Atr	Neg Atr	Rank Size	Parcel/ Sq mile	Comments	Project Number(s)
1861	4.5+		30/48	569	nhbr score almost high, low armor	29,73,83
1889	1.5+		39/48	1148	nhbr score high, wetlands rank high	72,84

NZ_Nearshore Zone

Site Scale = medium disturbance **Restore/Enhance/Conserve / Preserve**
Landscape Scale = low disturbance

Site Scale
Site Scale
Landscape Scale

Unit ID	Pos Atr	Neg Atr	Rank Size	Parcel/ Sq mile	Comments	Project Number(s)
1860	4+		27/48	1901	nhbr rank high	24,89,90
1866	3.5+		12/48	501	nhbr rank high , wetlands rank high	87
1869	3.5+		40/48	1075	nhbr rank high, low armor	43,44
1875	5+	303D	7/48	33	Priest Point Park, low armor	82
1888	1.5+		15/48	1446	nhbr rank high, wetlands rank high, low armor	91
1891	5+	303D, toxic site	19/48	1109	nhbr rank high	33,34,35,36,48,88
1898	2+		10/48	1163	nhbr rank high	92,93

NZ_Nearshore Zone/ NC Nearshore Catchment

Nearshore Zone = medium disturbance **Restore/Enhance/Conserve / Preserve**
Contributing Catchment = low disturbance

Nearshore Zone
Nearshore Zone
Contributing Catchment

Unit ID	Pos Atr	Neg Atr	Rank Size	Parcel/ Sq mile	Comments	Project Number(s)
1875	5+	303D	7/48	33	Priest Point Park, low armor, nhbr rank high	82
1891	5+	303D, toxic site	19/48	1109	nhbr rank high	33,34,35,36,48,88
1895	2.5+		33/48	386	nhbr rank medium	39,40
1897	2.0+		9/48	399	nhbr rank medium,	67,96
1900	1.5+		14/48	597	nhbr rank low, wetlands rank high	71,85,86

Squaxin Island Tribe
Budd Inlet Habitat Restoration Prioritization Presentations

Workshops/meetings

Date	Name	Where	# attendees	purpose
2-11-10	Science workshop	Squaxin	10	technical
10-19-10	Final presentation	Squaxin	14	technical
9-22-10	Final presentation	WSU –Thurston	18	policy
11-8-10	Habitat conference	NWIFC	75	technical
11-10-24	Final presentation	WRIA 13	10	technical

Product

Budd Inlet Landscape Analysis	GIS database
Budd Inlet conceptual model	Map
Scientific meeting notes	Document
Landscape analysis conceptual paper	Document
Catchment of interest approach	Document

Juvenile Salmonid approach	Document
Attribute Filter	Excel list
Data Dictionary	Document
Budd Inlet projects	Excel list

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ATTACHMENT 3

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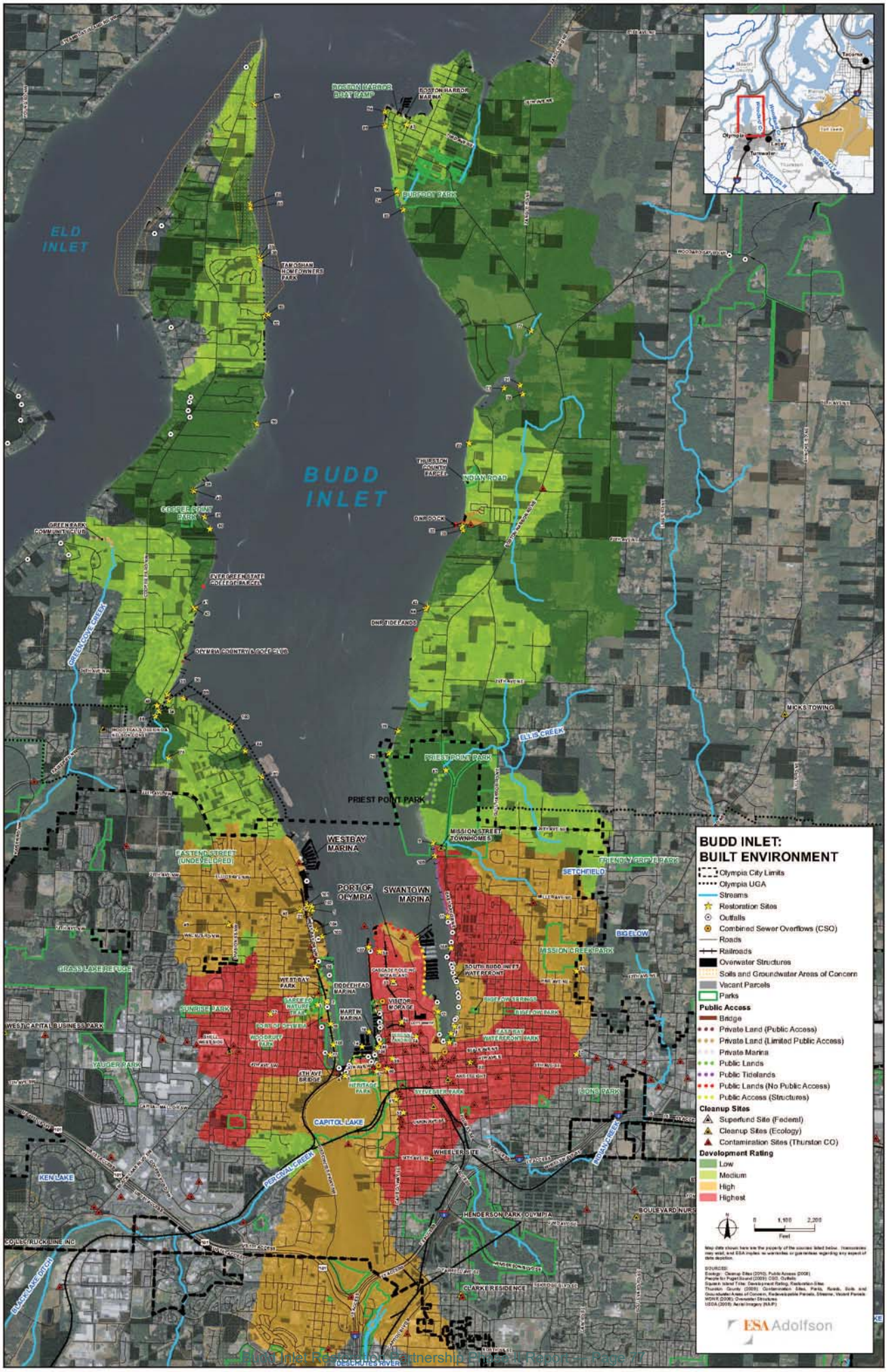
BUDD INLET:
BUILT ENVIRONMENT
Olympia City Limits
Olympia UGA
Streams
Restoration Sites
Outfalls
Combined Sewer Overflows (CSO)
Roads
Railroads
Overwater Structures
Soils and Groundwater Areas of Concern
Vacant Parcels
Parks
Public Access
Bridge
Private Land (Public Access)
Private Land (Limited Public Access)
Private Marina
Public Lands
Public Tidelands
Public Lands (No Public Access)
Public Access (Structures)
Cleanup Sites
Superfund Site (Federal)
Cleanup Sites (Ecology)
Contamination Sites (Thurston CO)
Development Rating
Low
Medium
High
Highest
ESA Adolfson
ELD INLET
BUDD INLET
BOSTON HARBOR BOAT RAMP
BOSTON HARBOR MARINA
BURFOOT PARK
TAMOSHAN HOMEOWNERS PARK
THURSTON COUNTY PARCEL
INDIAN ROAD
ONI ROAK
COPPER POINT PARK
GREEN PARK COMMUNITY CLUB
EVERGREEN STATE COLLEGE PARCEL
ONRI TIDELANDS
OLYMPIA COUNTRY & GOLF CLUB
GREEN COVE CREEK
MICKS TOWING
ELLIS CREEK
PRIEST POINT PARK
WESTBAY MARINA
MISSION STREET TOWNHOMES
EASTSIDE STREET (UNDEVELOPED)
FRIENDLY GROVE PARK
SETCHFIELD
PORT OF OLYMPIA
SWANTOWN MARINA
BIGELOW
MISSION CREEK PARK
GRASS LAKE REFUGE
WESTBAY PARK
BIDEWEAD MARINA
SOUTH BUDD INLET WATERFRONT
SUNRISE PARK
MARTIN MARINA
VISITOR MORAGE
WEST CAPITAL BUSINESS PARK
WOODRUFF PARK
EASTBAY WATERFRONT PARK
YAUDER PARK
4TH AVE BRIDGE
HERITAGE PARK
SYLVESTER PARK
LIONS PARK
CAPITOL LAKE
WHEELER SITE
KEN LAKE
PERCIVAL CREEK
MOTTMAN CREEK
HENDERSON PARK OLYMPIA
SOULEVARD NURSERY
SOUTH TRUCKLINE INC
CLARKE RESIDENCE
BLACKLAKE DITCH
DESCHUTES RIVER

BUDD INLET: BUILT ENVIRONMENT
Olympia City Limits
Olympia UGA
Streams
Roads
Railroads
Overwater Structures
Restoration Sites
Outfalls
Combined Sewer Overflows (CSO)
Soils and Groundwater Areas of Concern
Vacant Parcels
Parks
Public Access
Bridge
Private Land (Public Access)
Private Land (Limited Public Access)
Private Marina
Public Lands
Public Tidelands
Public Lands (No Public Access)
Public Access (Structures)
Cleanup Sites
Superfund Site (Federal)
Cleanup Sites (Ecology)
Contamination Sites (Thurston CO)
Development Rating
Low
Medium
High
Highest
BUDD INLET
WESTBAY MARINA
PORT OF OLYMPIA
SWANTOWN MARINA
CAPITOL LAKE
HERITAGE PARK
4TH AVE BRIDGE
ESA Adolfson

ATTACHMENT 4

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MEMORANDUM

June 15, 2010

To: Budd Inlet Restoration Partnership

From: Margaret Clancy, Elizabeth McManus

Subject: Preliminary Thoughts on Mitigation

Task 3 of the scope of work calls for the consultant team to help the Budd Inlet Partnership identify ways to direct off-site, out-of-kind or in-kind aquatic permit mitigation to high-priority conservation and restoration sites in the Inlet. This memorandum outlines some preliminary thoughts on mitigation options and Task 3.

Mitigation approaches can be grouped or characterized in several ways. For this exercise it may be helpful to think of two categories of mitigation approaches:

- Permittee-responsible (PR) mitigation – a permit applicant/developer has primary responsibility for finding, acquiring, constructing and maintaining a mitigation site/project. This category includes mitigation that may be required as a result of a project one of the jurisdictions undertakes; the jurisdiction is the permittee and has primary responsibility for finding, acquiring, constructing and maintaining a mitigation site/project.
- Non-permittee responsible (NPR) mitigation – an applicant/developer pays someone else, a third-party, to implement mitigation for them.

The focus of Task 3 is approaches to direct jurisdiction mitigation actions to high-priority conservation and restoration sites. The first step, then, will be to determine what types of impacts the jurisdictions anticipate needing to mitigate. Understanding this will allow "matching up" of functions that will be impacted with functions that might be protected or restored at one of the high-priority conservation or restoration sites.

Once there is some sense of the match between expected impacts and potential sites, we would need to think through mitigation credits/ratios. Ecology will shortly issue guidance on mitigation credits/debits which, although focused on wetlands, may be helpful for this step. The combination of understating mitigation needs, potential conservation and restoration sites, and credits/debits could then support the jurisdictions' project-by-project decisions and/or consideration of advance mitigation or other options either individually or collectively. This will be one of the primary efforts we help you with as we get into the mitigation-focused part of the project.

It also may be useful to consider policies and other approaches that would encourage developers to choose one of the priority conservation or restoration sites/projects as their mitigation site/project instead of doing "their own thing" on-site or on a site they own/have ready access to. In this arena, the jurisdictions would be acting in their role as regulatory/permitting agencies. Approaches that might be considered include:

1. Encourage advance mitigation – this works best for projects with specific/known impacts.
2. Amend policies and regulations to prefer use of the priority conservation/restoration sites—or even require it for certain kinds of impacts or impacts in certain areas.

3. Reduce mitigation ratios, bond requirements, permit fees or other regulatory requirements for mitigation projects that occur at/on a priority site.
4. Develop guidelines for the types of impacts might be offset with each priority conservation or restoration site/project—this is related to the work we'll help the jurisdictions with to determine how their anticipated impacts might be offset with mitigation at high-priority sites. Working this out in advance would facilitate decisions about out-of-kind mitigation, which could also help developers by reducing uncertainty. This might be combined with documentation showing how priority conservation/restoration sites conforms to guidelines about selecting mitigation using a watershed approach, which could be used to gain support from state and federal regulatory agencies for those permits.

You also might consider more complex approaches. Some examples that have been tried in the Puget Sound region include the following.

1. Special Area Management Plan (SAMP). You could develop and seek approval for a SAMP, which would outline impact and mitigation scenarios across the Inlet. This approach has not been widely used in Washington (one example is the Mill Creek SAMP) but the idea is to identify areas for protection, preservation, and enhancement, and areas where future development would be allowed, provided that it meet specific criteria. The Squaxin Tribe's restoration priorities could provide a basis for this type of decision-making, but additional information and land use planning studies might also be required.
2. Tailored Critical Area/ Shoreline Buffers. The city of Mt. Vernon adopted an alternative to the 'one size fits all' wetland and stream buffer approach. The City's allows property owners to deviate from the standard wetland and stream buffer considering the condition of the wetland or stream and other factors. The City identifies a management zone that encompasses both a minimum buffer and a standard buffer. Property owners are allowed to construct encroach within the management zone in exchange for implementing specific actions to restore and/or enhance on-site critical area/buffer conditions or paying into a Critical Area Management Fund, which is used to fund predefined restoration actions at priority sites. The basic concept of using a tailored buffer system in combination with a targeted mitigation/restoration program may be applicable and pertinent to the jurisdictions.
3. Cap and Trade. It may be possible to implement some type of regulatory cap and trade with wetland/stream, and nearshore impacts such as bulkheads. The jurisdictions surrounding Lake Tahoe did this for impervious surfaces.
4. Private Market. Establish/facilitate a private market mitigation exchange as they are exploring in Clark County.

If there is interest, and if it appears there is a market for a third-party mitigation provider to sell mitigation credits to developers to fulfill their mitigation obligations, you also might consider third-party mitigation approaches. Third part mitigation options include:

- In lieu fee programs (either the Partnership regional program or a home-grown version)
- Mitigation bank (if we have a sizeable mitigation or restoration site/project, > 40 acres)

Third-party mitigation approaches also might be relevant to helping the jurisdictions meet their mitigation obligations – for example, if a mitigation bank were established that could sell appropriate credits to offset jurisdiction impacts. All third-party mitigation options likely require a long-lead-time.

ATTACHMENT 5

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MEMORANDUM

January 28, 2011

TO: Budd Inlet Restoration Partnership

FROM: Elizabeth McManus

SUBJECT: Profiles of Other Partnership Efforts

In response to Task 4 of the scope of work, the consultant team compiled the attached profiles of locally-driven partnerships in Washington State for the Budd Inlet Partnership to evaluate as potential structural models, and (if necessary to implement shared priorities) identify ways for all or some of the partners to collaborate on project implementation. The profiles were developed through a combination of web-research, brief telephone interviews with a few key project leaders, and review of the partnerships' governance and other background documents. Each profile contains information on why the partnership was established (goals and mission); the partnership model (governance and participating parties); funding sources; accomplishments to date; and current status. Key themes in each of these areas are outlined below.

List of Partnership Efforts Profiled
Citizens for a Healthy Bay
The Nisqually River Council
The Lower Columbia River Estuary Partnership
Snake River Salmon Recovery Board
Chehalis Basin Partnership
Oakland Bay Stewardship Initiative
Bellingham Bay Waterfront Redevelopment/ Demonstration Pilot
Port Angeles Rayonier Mill Redevelopment
Port of Anacortes Restoration/Redevelopment

Key Themes
Goals and Mission

- All have a variant of the mission to coordinate efforts to clean up, restore, redevelop and/or protect watersheds or old industrial sites.
- All have a similar goal of enhancing sustainability and supporting the social, cultural, and economic well-being of communities.
- All provide some sort of framework for citizens, interest groups, and/or government organizations to work collaboratively to identify and solve issues and leverage resources.

Partnership Model

- Most efforts have a Board or other oversight committee that acts as the authoritative body setting the mission, policies, and work plans.
- Most are joint public-private initiatives, with a mix of representatives from cities, counties, Tribes, ports, federal and state governments, conservation districts, public utilities, non-governmental organizations, community organizations, local business, citizens, and/or universities.

- The partnerships profiled illustrate that are many different ways to structure the governance and implementation of partnership efforts from more simplistic (one lead agency and one working group) to multi-layered including any number of councils, working groups, technical advisory teams, and committees performing various roles and duties.
- A couple partnerships have a formal citizen advisory committee (CAC) to ensure citizen representation.
- Most partnerships have some sort of staff level support either through Washington State Department of Ecology (DOE) or the partnership itself.
- A few are governed by Memorandums of Understanding/intergovernmental agreements.

Funding Sources

- Funding generally comes from a combination of public and private funding sources, with the most common source of partial funding coming from DOE. Other common funding sources include cities, ports, counties, US EPA, Foundations, and businesses.
- Most partnerships currently retain, or have in the past, at least partial funding via state or federal sources (e.g. Congress' National Estuary Program; DOE Watershed Planning grants, MTCA funding, or legislative provisio; NOAA PCSRF; and/or Recreation Conservation Office (RCO) State General Fund).
- A few evolved into registered 501(c)(3) organizations, deeming this the most flexible way to seek new funding, particularly when state or local funding sources ran out.
- Some stewardship activities are volunteer supported.
- Some partnerships act as a grant provider, awarding grants to local agencies and organizations to support various implementation activities.

Accomplishments

- One of the biggest accomplishments across the board is large-scale habitat restoration and monitoring.
- Most of the partnerships profiled have developed one or more management or stewardship plans that guide their activities.
- Other key accomplishments include:
    - Coordination of endangered species recovery efforts;
    - Development and growth of public outreach, education, and volunteer programs; and
    - Sustainable redevelopment.

Current Status

- All the efforts profiled are currently active, with most focusing on implementation of established plans, community outreach, and continued redevelopment and restoration actions.

LOCALLY DRIVEN PARTNERSHIP CASE STUDIES

Citizens for a Healthy Bay (http://www.healthybay.org/)

Goals (Why Formed)

The mission of Citizens for a Healthy Bay (CHB) is to represent and engage citizens to clean up, restore and protect Commencement Bay, its surrounding waters and natural habitat. CHB was formed in 1990 to represent Tacoma citizens in the Superfund cleanup of Commencement Bay. Citizens for a Healthy Bay took on the mission of representing and giving a voice to the citizens of Tacoma at meetings, forums and planning sessions which brought together local, state and federal government agencies, businesses and industry groups to find the most effective methods for cleaning up the polluted bay. From the start, CHB worked to create a cooperative, non-polarizing and solution-focused approach guided by its team of technical experts from the academic, science and business communities to provide oversight of toxic cleanups and brownfield redevelopment, habitat restoration, protection against pollutions, and sustainability.

Partnership Model

Six staff members including an Executive Director, Senior Policy Analyst, Bay Patrol Director, and three Project Coordinators.

Ten Board Members composed of knowledgeable and experienced leaders from business, government and education. They define and advance the mission of CHB and act as ambassadors to constituents and to the many public and private organizations with which CHB partners.

Partnerships with a wide variety of public and private organizations and agencies include U.S. EPA, Washington State DOE, Pierce County, City of Tacoma, Port of Tacoma, various Foundations, Economic Development Board for Tacoma-Pierce County, Washington State DNR, Puget Sound Partnership, U.S. Coast Guard, Pierce Conservation District, Cascade Land Conservancy, Puyallup River Watershed Council, regional Universities, Tacoma Urban League, Tacoma Community House, Tacoma Waterfront Association, Foss Waterway Development Authority, Foss Waterway Seaport, Northwest Marine Trade Association and Hewescraft Marine.

Funding Sources

CHB is a registered 501(c)(3) retaining funding from a combination of private and public funding sources including City of Tacoma, Port of Tacoma, Pierce County, WA DOE, US EPA, Natural Resources Damage Assessment Trustees, Boeing Charitable Trust, Russell Family Foundation, Great Tacoma Community Foundation, and business and individual memberships at varying pledge levels.

Accomplishments

Thanks to the efforts of CHB and the community, parts of bay that were once dead zones due to industrial waste are now recovering. Currently, CHB monitors and manages 16 habitat restoration sites on Commencement Bay.

As the cleanup process took place, CHB began compiling a library documenting each step in the process. This library grew into one of the most comprehensive depositories of Superfund technical information in the nation. The library is used today to communicate the lessons of Commencement Bay's cleanup process to the public and to educators and scientists confronted with similar problems in other cities.

Status

CHB currently focuses on advocacy initiatives (e.g. Brownsfield Cleanup and Redevelopment, Shoreline Planning and Development, and NPDES Permits) and community outreach. It also runs a number of volunteer programs including the Bay Patrol program and Adopt-A-Wildlife Area program, as well as a water pollution hotlne.

The Nisqually River Council (http://nisquallyriver.org/)

Goals (Why Formed)

The Nisqually River Council's (NRC) mission is to encourage and support sustainability in the Nisqually Watershed in order to steward its resources in perpetuity and build a model for harmonious living. In 1985 the state legislature directed the Department of Ecology to create a comprehensive management plan for the river and its watershed, resulting in the Nisqually River Management Plan of 1987. The Council's "Nisqually Watershed Stewardship Plan," adopted in 2006, provides a roadmap for the next 15 years of watershed stewardship and a vision for the next 50 years. Its purpose is to protect the health of the people, businesses, economy, tourism, wildlife habitat, and water sources in the Nisqually watershed.

Partnership Model

The Nisqually River Task Force, consisting of federal, state and local governments, business representatives, the Nisqually Indian Tribe, and interested citizen activists, created the Nisqually Watershed Stewardship Plan in 2009. The Nisqually River Foundation provides for staffing and coordination of plan elements.

The Nisqually Watershed Stewardship Plan is implemented through the Nisqually River Council, a non-regulatory coordination, advocacy, and education organization. A separate Nisqually River Citizens Advisory Committee (CAC) assures citizen representation during implementation of the Nisqually Watershed Stewardship Plan. Certain elements of the Nisqually Watershed Stewardship Plan may be addressed through acts of participating agencies, advisory committees, or other entities such as an optional 501(c)(3) nonprofit organization.

The Nisqually River Council consists of nineteen active members: Lewis, Pierce, and Thurston Counties; WDFW; WPRC; WDNR; WDOE; Washington Conservation Commission; UW Pack Forest; Nisqually Tribe; Joint Base Lewis-McChord; Nisqually National Wildlife Refuge; Mt. Rainier National Park; Girfford Pinchot National Forest; Tacoma Public Utilities; one joint representative of the municipalities of Eatonville, Roy, and Yelm; and three representatives from the Citizens Advisory Committee.

The Role of the CAC in the original Nisqually River Management Plan was to provide for an active body of citizens within the watershed who work harmoniously with the River Council, who are substantially represented on the

Council with three voting members, and who meet independently every month, elect our their Chairs and Vice Chairs, and who plan an Annual Agenda in concert with the objectives of The River Council's Goals determined at the Annual Retreat. The CAC purpose is four fold:

- To provide advice and information to the NRC, on topics requested by the Council.
- To report on activities throughout the Watershed for the purposes of keeping the Council informed on citizen issues.
- To request information, approvals, or actions from the Council in order to be an effective watershed steward group.
- To assist the Council by participating and serving on various committees and units for Education, Natural Resources, Public Access, Salmon Recovery, Water Quality and Water Quantity Planning Unit, and on the Executive Committee.

A Memorandum of Agreement created the Nisqually Planning Unit in 1999. The Nisqually Planning Unit operates independently of the Nisqually River Council and the Nisqually River Foundation; however, the planning unit's work is reported to the council.

Funding Sources

Originally, funding and staffing for the council came from the Department of Ecology under the direction of the Washington State Legislature; however, the department was later unable to continue its support. The Nisqually Indian Tribe stepped in to provide some funding to resume staff support for the council. A portion of the money was also dedicated to exploring the best long-term funding option for the council and its projects. The council determined that a nonprofit corporation would provide the most flexibility in seeking new funding. Currently, the Nisqually River Foundation manages more than $1 million worth of grants for projects and staffing the Nisqually River Council. The Legislature has also provided funding through a proviso in the Department of Ecology's budget. The Nisqually River Foundation will continue to seek funding for new projects based on the priorities of the Nisqually River Council as it works to implement the Nisqually Watershed Stewardship Plan.

Currently [in 2009], the Nisqually River Council receives revenue from grants and a by a legislative proviso in the Department of Ecology's budget. The Watershed Planning Unit is an independent group that is financed by grants from Ecology's watershed planning grant program. The McAllister / Yelm Stewardship Coalition has not yet been formed but will most likely be financially supported by the five member jurisdictions. There is potential for financial collaboration that can benefit all of the organizations.

Accomplishments

In conjunction with AHBL, a planning and architecture firm, developed Low Impact Development Design (LID), Architectural, and Green Building voluntary design guidelines for the watershed. Other accomplishments include:

- Adopting a Nisqually River Resource Management Plan with major timber owners, moving toward watershed-specific timber harvest prescriptions.
- Established the Nisqually River Education Program in 1990, developing and promoting a watershed based curriculum for grades K-12, reaching 600 students annually.
- Adopted a comprehensive Fall Chinook salmon recovery plan three months after the fish was listed under the Endangered Species Act. Created by the Nisqually Indian Tribe with Council support and endorsement, the plan was the region's first of its kind and a model for other watersheds.

- Created the Nisqually Stream Stewards in 2000; more than 300 volunteers are participating in restoration and monitoring activities.
- Adopted a Watershed Plan in 2004, the first under the State Watershed Planning Act, to guide local governments on water use and quality, and balancing resource and community needs.
- Developed an Upper Nisqually Community Plan in 1999.

Status

In addition to continuing to implement the Nisqually Watershed Stewardship Plan, the Nisqually River Council conducts a number of volunteer programs including the Water Quality Monitoring Project, Student Green Congress, and Stream Stewards.

The Lower Columbia River Estuary Partnership

(http://www.lcrep.org/)

Goals (Why Formed)

The mission of the Lower Columbia River Estuary Partnership (Estuary Partnership) is to preserve and enhance the water quality of the estuary to support its biological and human communities. The Lower Columbia River Estuary Partnership, one of 28 programs in the National Estuary Program, is a two-state, public-private initiative. Using a watershed approach, the Estuary Partnership cuts across political boundaries - integrating 28 cities, 9 counties, and the states of Oregon and Washington over an area that stretches 146 miles from Bonneville Dam to the Pacific Ocean.

Partnership Model

The Estuary Partnership **Board** brings has authority and legal responsibility over the organization. The 21 Board members serve as stewards of the corporation and in doing so, set the mission, policy and work plans for the organization. They also work to ensure that the Estuary Partnership meets its obligations as a National Estuary Program (NEP). The Board in its annual membership appointments strives to ensure that the board includes, but is not limited to, representation from, private industry, labor, agriculture, forestry, recreation, environmental interests, ports, the general public, and American Indian tribes and federal, state, regional and local governments. The Board of Directors includes work groups and committees to assist in carrying out Estuary Partnership work plans and implementing the Comprehensive Conservation and Management Plan, the long term plan for the lower 146 river miles. Work Group membership is open to all interested parties. To broaden involvement and participation and to help implement tasks, work groups may form subcommittees to address specific objectives or host workshops on various topics.

The **Executive Committee**, its membership and duties, are established by the Board of Directors in their Board Policies. The Executive Committee consists of the Chair, Vice Chair, and Secretary, the immediate past chair, the representatives from the two Governors' offices, and representatives from U.S. Environmental Protection Agency, who serve as ex officio members. The duties of the Executive Committee, as prescribed in the Board Policies, are to oversee and carry out administrative, management, and financial functions for the Board of Directors.

The **Science Work Group** provides advice and support to the Estuary Partnership on scientific and technical issues and acts as a forum for the exchange of scientific information about the estuary. The group works to ensure a consistent and cooperative approach to scientific data, designing and implementing scientific and technical projects. Participation on the Science Work Group is open to all interested individuals, organizations, businesses, local governments, and state and federal agencies. Typical representatives include Board of Directors members; tribal, federal, state and local agency representatives; representatives from academe, private sector scientists and interested parties; and non-governmental representatives. The work group is staffed by the Estuary Partnership's Director of Technical Programs.

The 22 Estuary Partnership **staff** members are actively engaged in the day to day operation of the Estuary Partnership.

The Lower Columbia River **Water Trail Committee** advocates and works for the establishment, maintenance, and enjoyment of a safe, accessible, environmentally sensitive water trail on the 146 river miles of the lower Columbia River from Bonneville Dam to the Pacific Ocean. Participation on the Water Trail Committee is open to all interested individuals, organizations, businesses, local governments, and state and federal agencies. The Committee meets on a monthly basis and Committee members agree to support the vision and goals of the water trail, participate in regularly scheduled meetings, provide expertise and work on action plans, represent the views of their community or organization and serve as ambassadors for the Water Trail Project.

Funding Sources

LCREP is a 501(c)(3) non-profit corporation. The Estuary Partnership provides a regional framework to support and enhance local efforts. That support includes providing funds to local entities. Funding from the states of Oregon and Washington and Congress – through the National Estuary Program – supports base operations and help secure matching public and private dollars. Every dollar invested in the Estuary Partnership currently leverages eight additional dollars

Accomplishments

A selection of accomplishments:

Education

- Worked with over 38,600 children and 400 teachers in classrooms and field programs since 2000
- Secured large private donation to support education partnerships through 2004
- Secured private foundation grant for on-river trips for 3,739 children

Habitat Restoration

- Restored 2873 acres of habitat
- Secured funding to complete habitat mapping and inventory of entire 146 river miles from Bonneville to mouth - mapping underway
- Developed and tested restoration criteria that focus on restoring critical functions and habitat types.
- Developing strategic habitat restoration prioritization plan

Species Recovery and Planning

- Established policy level Executive Committee, requested by the Governors, to address and coordinate Endangered Species Recovery efforts

- Designated Lead Entity by Northwest Power Planning Council in Sub-basin planning process and completed Sub Basin plan for the Lower Columbia and Columbia Estuary Sub Basins
- Identified six Subbasin Strategies for the two subbasins
- Helping NOAA Fisheries develop Phase 2 recovery plans
- Launched 146 mile water trail for non motorized boaters that recreates the last leg of the Lewis and Clark Journey down the Columbia

Stormwater and Land Use

- Completed work with Oregon City and Longview to improve their building and land use codes to reduce runoff
- Developed a web-based field guide to highlight local examples of effective stormwater management techniques

Pollutants

- Implemented water quality and ecosystem monitoring with funding from the Bonneville Power Administration. Initiated monitoring for water quality elements including: nutrients, productivity, emerging contaminants, toxics such as PAHs and PCBs, currently used pesticides, trace elements in water. Initiated monitoring for Juvenile Salmonids: PCB congeners, DDT's, Organochlorine pesticides, PBDE's
- Initiated habitat monitoring that for elements including: tidal channel area, total edge tidal channels, elevation, bathymetry, channel cross sectional profiles, large woody debris, water elevation, lateral extent of flooding, velocity, temperature, turbidity, salinity, dissolved oxygen, pH, and species composition, frequency, stem density and percent cover of vegetation cover types

General

- Awarded 51 small grants totaling over $430,000 since between 1996 and 2003
- Secured a signed Management Plan Implementation Agreement amongst the Governors of Oregon and Washington and US EPA that committed the parties to implement the Management Plan
- Completed the Management Plan for the Lower Columbia River- first two-state framework for estuary ecosystem restoration and protection

Status

The Estuary Partnership works concertedly in three areas to:

- Protect the ecosystem and species - restore 19,000 acres of wetlands and habitat by 2014 and promote improvements in stormwater management.
- Reduce toxic and conventional pollution - conduct long term monitoring and work with partners to eliminate persistent bioaccumulative toxics, bring water bodies up to water quality standards, reduce hydrocarbon and heavy metal discharges and reduce bacterial contamination.
- Provide information about the river to a range of audiences - provide applied learning programs for children and build federal, state, local, public and private coordination.

Snake River Salmon Recovery Board

(http://www.snakeriverboard.org)

Goals (Why Formed)

The Snake River Salmon Recovery Board was developed in response to the rising need for salmon recovery and conservation efforts. The Snake River Salmon Recovery Plan (SRSRP) was submitted to NOAA in December 2005. In December 2006, NOAA published the plan in the Federal Register along with a supplement that summarizes and identifies the plan's strengths and weaknesses. The SRSRB works with NOAA to implement the plan.

The SRSB is a regional effort to create a science-based, community-supported strategy for salmon recovery. This encompasses the restoration of the diverse aquatic species of the Snake River Region that support the social, cultural and economic well-being of the communities within and outside the region. The Snake River Salmon Recovery Board is committed to engaging the region's stakeholders in implementing a plan that will help to sustain an ecosystem that makes the recovery of endangered fish species possible.

Partnership Model

The Snake River Region is managed by the 16 member **Snake River Salmon Recovery Board** (known as the Lead Entity). The Board is comprised of the County Commissioner and two citizen representatives from each of the following counties: Whitman, Asotin, Garfield, Columbia, and Walla Walla as well as one representative from the Confederated Tribes of the Umatilla Indian Reservation. The Board is responsible for soliciting project applications, creating an annual habitat project list, maintaining a three-year habitat work schedule, administering a Lead Entity Committee (see below), and maintaining overall organization and coordination (conducted through three staff members - a Director, Project Coordinator, and Administrative Assistant).

A local **Regional Technical Team** (RTT) of scientists is responsible for determining the technical merits of proposed projects and to review products produced by NOAA Fisheries with regards to salmon recovery. Their input on salmon recovery strategies will be balanced with the input of the public throughout the recovery planning process in the Snake River Region. The RTT is made up of representatives from local offices of the US Forest Service, various state agencies, and tribes.

The **Co-Leads** are representatives from the Conservation Districts from the four counties of Walla Walla, Garfield, Asotin and Columbia. The Co-Leads work with project sponsors to develop applications, work with the Lead Entity/SRSRB to develop annual and 3-year habitat work plans, participate in planning and implementation meetings (PU, SRSR, etc.), and maintain the Lead Entity Committee.

The **Lead Entity Committee** is managed by the Lead Entity/SRSRB through the Co-Leads and is comprised of two citizens from each of the four counties and one technical member from the CTUIR, WDFW, WDOE and USFS (NRCS, NPT pending). The roles of the Lead Entity Committee are to develop by-laws, develop project score cards, review project proposals and interact with project sponsors and rank projects for consideration by Lead Entity/SRSRB.

Funding Sources

The Lead Entity Program is funded by the Pacific Coast Salmon Recovery Fund (PCSRF) and Recreation Conservation Office (RCO) State General Fund. The Lead Entity/SRSRB provides annual contracts to the four county conservation districts to serve the roles of the Co-Leads.

Accomplishments

Site under construction

Status

The SRSRB has recently begun developing a pilot monitoring plan identified as the Intensively Monitored Watershed (IMW).

Chehalis Basin Partnership

(http://www.chehalisbasinpartnership.org/)

Goals (Why Formed)

The Chehalis Basin Partnership (formerly Chehalis Basin Council) was formed in 1998 under RCW 90.82, the Watershed Management Act, to provide a framework for local citizens, interest groups, and government organizations to work collaboratively to identify and solve water-related issues. The Mission of the Chehalis Basin Partnership (Partnership) is to coordinate local, tribal, state, federal and private efforts to reduce the effects of flooding, enhance fish resources, improve recreational opportunities, protect and restore water quality, protect surface water flow and ground water resources, protect recognized beneficial human uses of surface and ground water while at all times recognizing the relationship of these issues to the economic health and sustainability of the basin.

Partnership Model

Grays Harbor County is the designated **lead agency** and fiscal agent for the Partnership. The lead agency roles are to negotiate and execute agreements with WA DOE for Watershed Panning Grant funds; receive and disburse funds from DOE; solicit statements of qualifications, request for proposals or invitations for bids, negotiate scope of work, and execute contracts; and prepare and maintain records for accounting and administration of watershed planning grants.

The **Partnership** became a WRIA planning unit through an intergovernmental agreement in August 1998 for the purposes of watershed assessment, planning and management. As of December 2000, the following organizations are members of the Partnership. (NOTE: Organizations designated with an asterisk "*" have a signature block on the Intergovernmental Agreement, but have not actually signed the agreement): Counties of Grays Harbor, Lewis, Mason and Thurston; Confederated Tribes of the Chehalis; *Quinault Indian Nation; Cities of Aberdeen, Centralia, Chehalis, *Cosmopolis, *Elma, Hoquiam, McCleary, Montesano, Napavine, PeEll, Ocean Shores, and *Westport; Port of Centralia (representing port districts); WA DOE; Boistfort Valley Water; an Grays Harbor Water District #2.

Other organizations identified in the Intergovernmental Agreement that are eligible for membership in the Partnership include: Washington Department of Agriculture, Washington State Department of Fish and Wildlife, Washington State Department of Natural Resources, Bureau of Indian Affairs, Geological Survey, Bureau of Reclamation, U.S. Fish and Wildlife, U.S. Environmental Protection Agency, National Marine Fisheries Service, U.S. Forest Service, U.S. Army Corp of Engineers, Natural Resources Conservation Service, Weyerhaeuser (representing forestry interests), Lewis County Farm Bureau (representing agricultural interests), Chehalis Basin Fisheries Task Force (representing fisheries interests), Business Representative (none designated), Recreational Interest representative (none designated), Environmental Interest representative (none designated), Industrial water users (none designated). In addition, each of the counties (four total) that have decided to participate in the Partnership may appoint one private citizen to sit as a member of the Partnership.

The role of the Partnership and its members include:

- Actively representing each member's organization or area(s) of interest.
- Developing an Annual Plan of Work and project work plans for special projects such as Watershed Planning and Salmon Recovery.
- Provide direction to its fiscal agent on a general expenditure plan and contracts for services.
- Ensuring that the requirements of the Watershed Management Act, Salmon Recovery Act, and any other responsibility the Partnership has taken on are met.
- Approving policies that direct the work of the Partnership.
- Developing and accepting the final watershed plan as described in 90.82 RCW.
- Identifying appropriate items for the Partnership agenda, forwarding these agenda items to the Chair, Ecology Representative or Lead Agency, and making the necessary arrangements for the speakers or presenters needed to address the agenda item.

The Chair and Vice-Chair are appointed annually by the Partnership to serve one-year terms. Any Partnership member is eligible to serve as Chair or Vice-Chair. Recommendations for action may come from designated sub-committees or any Partnership member. Actions of the Partnership will be determined through a consensus based decision making process.

A Steering Committee was formed early in the process of organizing the Partnership. A Technical Advisory Committee was authorized in the Intergovernmental Agreement forming the Partnership. As the focus has shifted from organizing the Partnership to managing the various activities, the need for a Steering Committee decreased and the need for a Technical Advisory Committee increased. However, both functions are needed and there is a great deal of overlap between the people who have been participating as members of the Technical Advisory Committee and the people who participated as members of the Steering Committee. Currently the **Technical Advisory Committee** also serves as the Steering Committee. The role of the Steering/Technical Advisory Committee is to: Review administrative, process and policy issues, evaluate alternative approaches to policy and action items, and make recommendations to the Partnership. As well as, evaluate the technical or scientific needs of the Partnership as it works on the issues, make recommendations on how to fill those needs, and review technical work performed by others. The Steering Committee reports regularly to Partnership and the Partnership has final decision-making authority on all policy matters. The Chair of the Steering/Technical Advisory Committee is a member of the Chehalis Basin Partnership appointed by the Partnership.

According to the Intergovernmental Agreement, each county selects one citizen to sit as a member of the Partnership. This person represents the interests of the individual private citizens in the basin on the Partnership

and is also a member of the **Citizens' Advisory Committee** (CAC). In addition to appointing a citizen to serve as a member of the Partnership, each county appoints three additional citizens to sit on the Citizen's Advisory Committee. The CAC reviews Partnership work products and provides formal recommendations to the Partnership. The CAC has the opportunity to review and comment on evaluations and recommendations prepared by the Steering/Technical Advisory Committee. The CAC also hosts informational presentations by state, federal, and local experts on important watershed issues, to help committee and Partnership members make informed decisions. A critical function of the CAC is advising the Partnership on how to inform the general citizenry within the Chehalis Basin about the goals, actions, and outcomes of the work of the Partnership, and how to involve this citizenry in the work of the Partnership. The Chair of the Citizens' Advisory Committee is a CAC member selected by the committee.

The interim by-laws adopted by the Chehalis Basin Partnership on February 26, 1999 included provisions for establishing additional committees as needed to focus on specific issues related to the Partnership's responsibilities. After some members of the Partnership committed time to serve on a working committee to develop the Summary Implementation Strategy (SIS) for the Grays Harbor Fecal Coliform Total Maximum Daily Load (TMDL), the suggestion was made to form a Partnership Water Quality committee. **The Water Quality Committee** is composed of individuals with some interest, stake or expertise in the subject of water quality. The members have an interest in the outcome of the work the Partnership is doing and the ability to apply a working knowledge of the impacts that water quality decisions would have in the Chehalis Basin and its residents. The role of the Water Quality Committee is to:

- Evaluate alternative approaches to policy and action items related to water quality and make recommendations to the Partnership.
- Evaluate the technical or scientific needs of the Partnership as it works on the issues, make recommendations on how to fill those needs, and review technical work performed by others.
- Work in conjunction with the Ecology on current and future TMDLs.
- Work with Ecology to establish early and affective communication between Chehalis Basin Partnership and effected parties.
- Develop a list of prioritized water quality projects for consideration and acceptance by the Partnership.

The Chair of the Water Quality Committee will be a member of the Chehalis Basin Partnership appointed by the Partnership.

WA DOE provides **staff** support to the Chehalis River Basin Partnership.

Funding Sources

Funding comes from Watershed Management Grants made available by DOE and/or other public and private funds which are intended for watershed planning and implementation.

Accomplishments

The Chehalis Basin Partnership created a Salmon Habitat Restoration Strategy for the Basin to use as a tool in prioritizing habitat projects to recommend for state and federal assistance. In addition, the Partnership has developed a Watershed Management Plan (WMP) which was adopted in 2004 to help better manage the water resources in the Chehalis Basin.

Under Phase II of the Chehalis Basin Partnership strategic plan, a collection of technical assessments and reports on water quality and quantity have been developed.

Status

All branches (Partnership, committees, etc.) are active and continue to work on implementation of the Watershed Management Plan. There a number of volunteer opportunities including the Grays Harbor Stream Team, as well as an annual Chehalis Watershed Festival, a free hands-on family event intended to inspire and raise awareness about the unique natural resources of the Chehalis Basin.

Oakland Bay Stewardship Initiative

Goals (Why Formed)

The project goal is to foster behavior change, clean up toxics, invest in technical assistance and best management practice incentives, innovate with low impact development and nearshore conservation, investigate unusual sources of water pollution, and judge success by the opportunity to harvest shellfish. The initiative targets rural home-owners and renters using best practice, evidence-based intervention and social marketing.

Partnership Model

Partners: Squaxin Island Tribe, Washington State University Extension Service, Mason Conservation District, Mason County Public Health, City of Shelton, State Department of Agriculture, State Department of Health, State Department of Ecology, Green Diamond Resource Company, Taylor Shellfish, Seattle Shellfish, Simpson Timber, University of Washington Sea Grant, Puget Sound Partnership

Funding Sources

The Squaxin Island Tribe received a grant from the Environmental Protection Agency, Region 10. The plan was partially funded by Mason County WSU Extension Service. Funding was also provided by a University of Washington Sea Grant, and partner organizations provided additional support.

Accomplishments

Water quality improvements in Oakland Bay have allowed for an upgrade to the shellfish growing area, an increase in on-time inspections and maintenance of septic systems, and an increase in farm conservation plans implemented in the watershed.

Just six months into the social marketing initiative, there has been a 26 percent increase in septic maintenance in the watershed, a water quality upgrade of the shellfish growing area by the state Department of Health, and an increase in farm conservation plans.

Status

Social marketing activities were launched in 2009 and are ongoing.

Bellingham Bay Waterfront Redevelopment/ Demonstration Pilot

Goals (Why Formed)

In 1996, a cooperative partnership of 15 federal, state, tribal, and local stakeholders joined together to form the Bellingham Bay Demonstration Pilot Team. The mission of the Pilot Team was to develop a new cooperative approach to expedite sediment cleanup, source control, and habitat restoration for sediment cleanup sites around Bellingham Bay.

The Port of Bellingham is working with the City of Bellingham on a waterfront redevelopment effort that will bring the community's goals and visions for the future waterfront to reality. Bellingham's waterfront and the Whatcom Waterway are evolving from a heavy industrial waterfront to a waterfront that balances traditional maritime activity with growing public access and recreational uses. These changing uses, as well as a Baywide environmental cleanup effort, are the focus of a community effort to redevelop the waterfront.

Partnership Model

Washington Department of Ecology was the lead agency for the pilot project. The pilot team consisted of the Port of Bellingham, City of Bellingham, Whatcom County Health Department, Lummi Nation, Nooksack Tribe, Georgia-Pacific West, WDFW, WDNR, WDOT, Puget Sound Water Quality Action Team, National Marine Fisheries Service, U.S. Army Corps of Engineers, U.S. EPA, and U.S. Fish and Wildlife Service.

Funding Sources

Washington Department of Ecology, as the lead agency, for the pilot project.

Accomplishments

In October 2000, the Department of Ecology, as lead agency for the Pilot, issued the Pilot team's planning efforts in the Bellingham Bay Comprehensive Strategy/Final Environmental Impact Statement. The Comprehensive Strategy was designed to help guide future decisions on control of pollution sources, cleanup and disposal of polluted sediments, restoration of habitat, and in-water and shoreline land uses from a baywide perspective.

The evolution of uses for the waterfront became a community focal point when the Georgia Pacific Corp. closed its waterfront pulp mill in 2001. Suddenly a huge swath of waterfront property became available for new uses and a new vision. The loss of mill jobs also focused attention on the need to ensure that a new waterfront includes new job opportunities. At the same time, an innovative plan for a Baywide cleanup of historical contamination was taking shape. The Bay Pilot Project brought together the Port of Bellingham, City of Bellingham, state and federal regulatory agencies and tribal interests to create a bay and waterfront cleanup that recognized the changing land uses.

After the pulp mill closure in 2001, the Port and City jointly launched the citizen-led Waterfront Futures Group to create a bold new waterfront vision. This group fostered incredible public participation and public support as it developed a detailed plan for the future, calling for "creation of a mixed-use neighborhood that combines commercial, institutional, educational, retail service and residential uses." Since then, the Port and City have taken

steps to bring this vision to reality. In January 2005, the Port acquired all 137-aces of Georgia Pacific's contaminated waterfront property, including its wastewater treatment lagoon. At the same time, the Port and City began working together to clean up and redevelop this industrial property to support a variety of uses including public parks and promenades, homes, businesses, and light industry.

Status

Redevelopment efforts are ongoing.

Port Angeles Rayonier Mill Redevelopment

Goals (Why Formed)

Rayonier Inc. operated a pulp mill in Port Angeles from 1930 until 1997, when they closed and dismantled it. Over the years, the mill emitted hazardous substances that still pollute the land and water. Ecology is working with Rayonier and other local entities to investigate the contamination and clean up the environment.

Partnership Model

Under a 1999 agreement with Ecology, the Lower Elwha Klallam Tribe has a concurrence role in the cleanup process. Ecology agrees not to move forward with proposed cleanup decisions without the Tribe's concurrence.

Funding Sources

Washington DOE/ MTCA funding.

Accomplishments

In 2002, Ecology and Rayonier entered into an Agreed Order for investigation of the marine portion of the site. In 2004, they entered into a similar agreement for the upland portion of the site. For the next few years, Rayonier worked on these investigations, as well as several partial cleanups, called Interim Actions. These actions include soil excavation and removal of concrete foundations and piping, and a fuel tank.

The investigations for the marine and upland portions of the site do not define the full extent of contamination. Disagreement over the extent has been a significant factor in the pace of cleanup. To expedite moving cleanup forward, Ecology and Rayonier signed a new agreement to plan for cleanup of the Study Area – a portion of the site that the parties agree should be investigated. The Study Area includes the upland property and adjacent marine environment. However, Rayonier is still liable for cleanup of the entire site—any area where contamination from former mill operations has come to be.

Status

In 2007, Ecology gave the City of Port Angeles $50,000 in funding to explore visions for the future use of the Rayonier site. The City has brought together a diverse group of stakeholders to begin this process. In 2009, Ecology provided the city with $230,000 to expand the visioning process and to integrate its combined sewer overflow realignment with cleanup.

In 2008, the City of Port Angeles and the Port of Port Angeles partnered to create the Harbor-Works Development Authority. In 2009, Ecology provided the agency with a $200,000 Integrated Planning Grant for a study to help it decide whether to purchase the Rayonier property. In September of 2010, Harbor-Works' board voted to dissolve.

Ecology also provides Public Participation Grant funding to the Olympic Environmental Council. The grant is designed to help the organization encourage public participation in the cleanup process.

Port of Anacortes Restoration/Redevelopment

Goals (Why Formed)

In and around Fidalgo Bay, Washington Department of Ecology (DOE) is working with the Port of Anacortes, other site owners, area tribes, and others to clean up and restore sites contaminated with gasoline, diesel fuel, metals, and other substances.

Partnership Model

WA DOE working with the Port of Anacortes

Funding Sources

WA DOE, the Port of Anacortes, and industries responsible for clean-up efforts

Accomplishments

Dakota Creek Industries (DCI) shipyard: Work is under way on Project Pier 1, a joint effort involving DCI and the Port to redevelop the shipyard along Guemes Channel. DCI will invest at least $13 million on the work, including dredging two ship basins, constructing bulkheads and a new central pier, and improving the uplands. The Port has disposed of more than 30,000 tons of contaminated sediments that were contaminated with gasoline, diesel, arsenic, dioxins, and metals related to historic shipyard operations. The Port has mitigated impacts to eelgrass from dredging and cleanup work with a 6-acre eelgrass planting project in south Fidalgo Bay.

Former Scott Paper mill: Ecology is working with the site's current owners – the Port and MJB Properties – and former owner Kimberly Clark to clean up the former mill site. Upland soil, groundwater and marine sediments are contaminated with chemicals, metals, and wood waste. Cleanup work began in late-2009.

Status

The Port will began work on the O Avenue Mitigation Site in mid-2009. That work will create more intertidal area and restore the shoreline just west of the shipyard; improve public access, and construct low-impact development stormwater demonstration projects.

Former Shell Oil tank farm: Ecology and the Port signed an Agreed Order for investigation and cleanup of this Port-owned site. Soil and groundwater are contaminated with gasoline and diesel from the former tank farm operation. Some interim work has been done, including removal of some contaminated soil. Cleanup is expected to start in late 2010 or early 2011.