Table of Contents

List of Tables

Table of Figures

Introduction

This section summarizes the methods used to develop the final list of natural resource (wetlands, riparian, and floodplain) restoration and/or enhancement sites. The final stage of the watershed characterization analysis combines the ecological benefits of each DAU and the environmental benefits of each natural resource site to develop a list of natural resource sites that will provide the greatest functional "lift" in the subwatershed.

Part I. What are the Landscape Conditions in West Budd?

Current conditions

Current land-use within the Offut lake sub-watershed was determined by processing Aerial photography and SPOT 10 meter satellite imagery captured in 2009. Approximately 24% of the West Budd Subwatershed in 2009 was covered by urban land uses (see Figure 13.0 and 13.1 Classification Percent Totals for West Budd Subwatershed). The West Budd subwatershed is highly urbanized with residential land-use, however, the small wall based streams to have intact riparian areas.

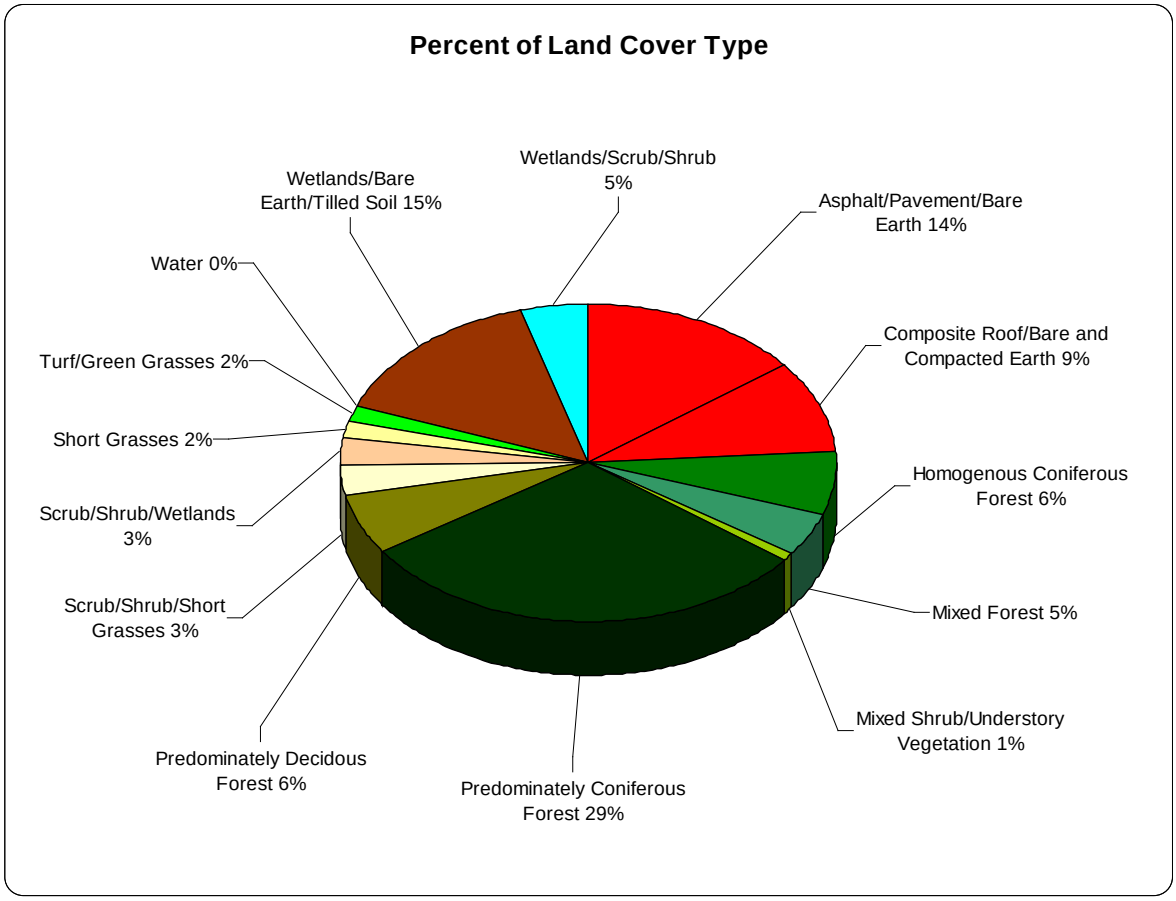


Figure 13.0 Classification Percent Totals for West Budd Subwatershed

Land cover data from 2009 SPOT imagery.

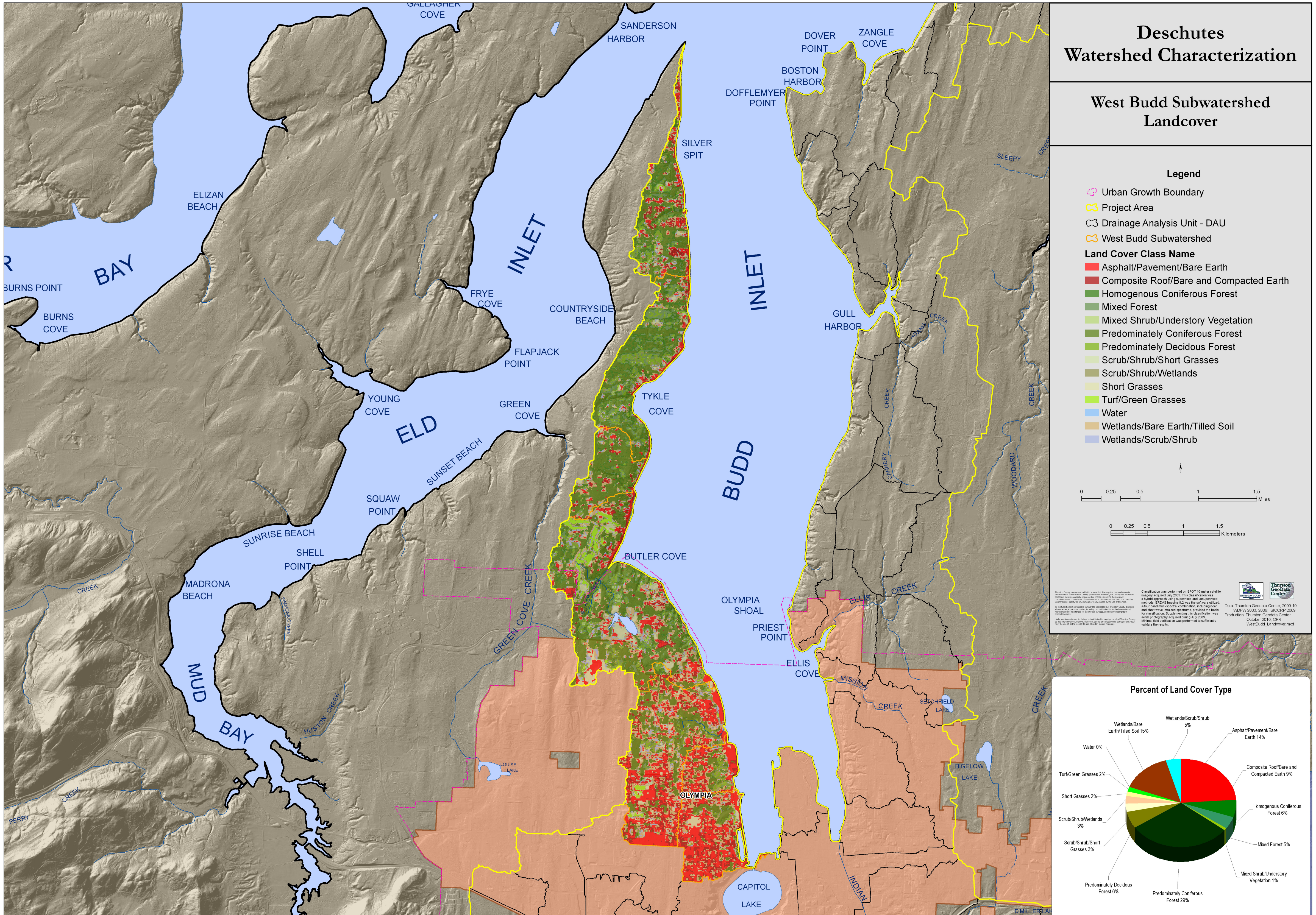


Figure 13.1 West Budd Subwatershed Land Cover

Part II. Characterize Condition of Ecological Processes in Study Area

Five ecological processes and two biological elements were assessed: the delivery and movement of water, sediment, wood, pollutants, and heat. The biological elements include aquatic integrity and habitat connectivity. The Matrix of Pathways and Indicators (MPI) was used to determine the function of each ecological process and biological indicator at the DAU scale. Following the assessment of each individual ecological process and biological element, Rules and Assumptions (Tables 8-14 in the Methods document) were used to rank each DAU as Properly Functioning (PF), At Risk (AR), or Not Properly Functioning (NPF). For complete details of the values used in the MPI, please consult Table 7 in the Methods document. For complete details of the Rules and Assumptions, please consult Tables 8 through 14 in the Methods document. Appendix A of this document contains the Methods document.

There are 7 DAUs totaling 2,489 acres (4 sq miles) in the West Budd subwatershed.

Determine Ecological Benefit of the DAU

Following the assessment of each individual ecological process and biological elements using the indicators above and the application of the Rules and Assumptions, the resulting final ranking of each DAU yields a baseline condition of ecological health for each DAU. All DAUs within the study area having ecological processes that are considered "At Risk" under current land use conditions are identified for further consideration. DAUs in the "At Risk" category for multiple key ecological processes are assumed to provide the greatest potential to maximize environmental benefits when natural resource sites are restored.

Table 13.0 includes each ecological process and biological element with the resulting function level. Subsequently, an aggregation of these processes and elements are used to provide an overall function level and ranking of the DAU.

Table 13.0 West Bay Ecological and Biological Function

DAU Id	Acres	Sq Mi	Aquatic Integrity	Habitat Connectivity	Water	Sediment	Wood	Pollutants	Heat
8	281	0.44	N/A	AR	AR	AR	AR	AR	AR
12	360	0.56	N/A	PF	AR	AR	PF	AR	AR
17	175	0.27	N/A	AR	AR	AR	AR	N/A	AR
18	790	1.23	N/A	AR	AR	AR	AR	N/A	AR
25	532	0.83	NPF	AR	NPF	AR	AR	N/A	NPF
29	242	0.38	N/A	AR	AR	AR	AR	NPF	NPF
26	118	0.18	N/A	AR	AR	AR	AR	N/A	NPF

All DAUs within the study area having a final ecological processes that is considered "at risk" under current land use conditions were identified for further consideration. DAUs in the "at risk" category for multiple key ecological processes are assumed to provide the greatest potential to maximize environmental benefits when natural resource sites are restored.

Table 13.1 illustrates the final ecological and biological function rank of each DAU

Table 13.1 Final DAU Ecological Function Rank

	Ecological Processes					Biological Indicators			
DAU Id	Water	Sediment	Wood	Pollutants	Heat	Aquatic Integrity	Habitat	Total Score	Rank
8	3	1	2	1	1	0	1	9	High
17	3	1	2	0	1	0	1	8	High
18	3	1	2	0	1	0	1	8	High
26	3	1	2	0	0	0	1	7	High
29	3	1	2	0	0	0	1	7	High
12	3	1	0	1	1	0	0	6	Moderate
25	0	1	2	0	0	0	1	4	Moderate

The final rank is used in the identification of potential restoration and enhancement sites when the DAUs and resource sites are combined to provide a final list of natural resource sites. West Budd has seven DAUs that have restoration potential (Figure 13.2 West Budd Subwatershed Ecological Function).

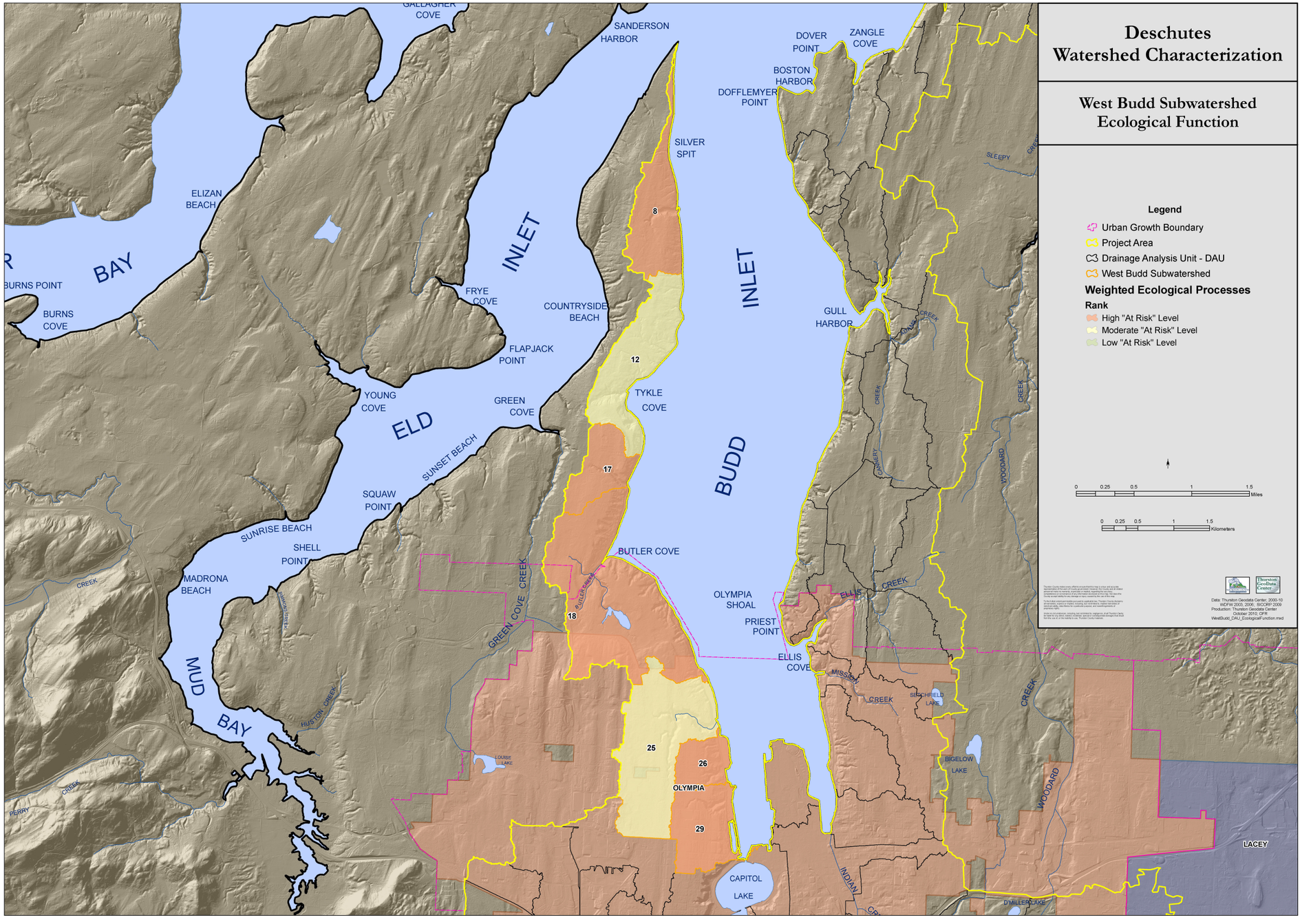


Figure 13.2 West Budd Subwatershed Ecological Function

Part III. Characterize Natural Resource Sites in Study Area

This section evaluates natural resource sites within the study area. The purpose is to determine natural resource sites that can be restored or enhanced in the surrounding landscape that will provide the greatest ecological benefit. This analysis is conducted concurrently with the analyses of the ecological processes. Upon completion of the DAU analysis and the natural resource site analysis, the sites identified are ranked in the context of the DAU and subwatershed landscape

Determine the Environmental Benefit of the Resource Sites

The natural resource sites are evaluated based on the attributes assigned during site assessment using Tables 22 to 24 in the Methods document to assign an environmental benefit final score. Once all the attributes have been evaluated, the following ranking criteria are used to rank the sites High, Moderate, and Low.

Following the conversion of natural resource sites from a score to Low, Moderate, or High rank, there were a total of 42 potential restoration or enhancement sites. Table 13.1 details the results.

Table 13.1 West Budd Environmental Benefit Ranking of Natural Resource Sites

West Budd Potential Restoration Sites				
Rank	Wetland	Riparian	Floodplain	Total
High	5	2	0	7
Moderate	13	2	0	15
Low	10	10	0	20

Part IV. Assess Potential Sites within the DAU

This section presents the results of a ranking process for all potential natural resource restoration sites. The ranking of a natural resource restoration site is based on the ranking of each site individually combined with the ranking of the DAU within which the restoration site is located. The result is a final combined score from 0 to 6, with a score of 6 representing those sites with the greatest potential for environmental benefit if restored.

Table 13.2 is used to score the natural resource sites in the context of the DAU. A site with a Low environmental benefit is a preservation site or completely degraded site that would provide a minimal environmental benefit if restored.

Table 13.2 Combined Ranking Score

Ecological Benefit (DAU)	Environmental Benefit (Resource Site)	Total Score
High	High	6
High	Moderate	5
Moderate	High	4
Moderate	Moderate	3
Low	High	2
Low	Moderate	1
N/A	Low	0

Thus, the Ecological Benefit (DAU) and the Environmental Benefit (Resource Sites) are ranked to provide a final score from 0 to 6. Following evaluation, a total of 22 sites were ranked within the corresponding DAU.

Results of natural resource restoration site ranking for wetlands, riparian and floodplain (where present) areas are described in the following sections.

The following wetlands, riparian and floodplain sections describe the final combined ecological benefit and environmental benefit ranking of natural resource sites.

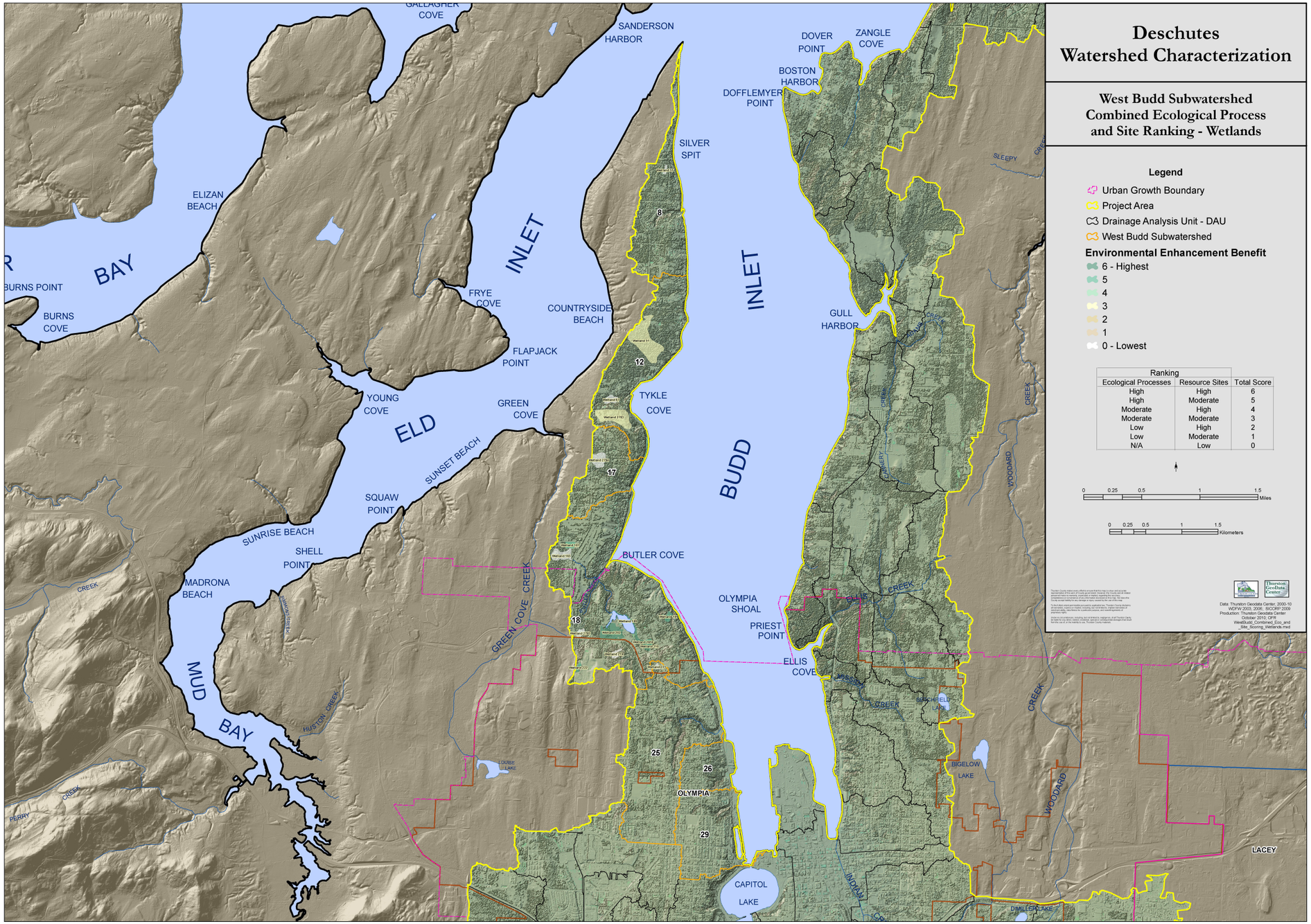
Wetlands

Table 13.3 presents the results of wetland restoration site ranking taking into account the combined wetland restoration potential and the DAU ranking. Figure 11.4 shows the location of each wetland restoration site. Wetland sites ranked Low and less than one acre are not included in the table, but are ranked and available in appendix B.

Table 13.3 Wetland Sites

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 202	High	6	13.99
Wetland 192	High	6	0.63
Wetland 2859	High	6	4.68
Wetland 189	High	6	8.81
Wetland 193	High	6	0.97
Wetland 188	Moderate	5	0.22
Wetland 203	Moderate	5	0.33
Wetland 222	Moderate	5	1.65
Wetland 181	Moderate	5	0.04
Wetland 205	Moderate	5	0.30
Wetland 211	Moderate	5	0.11
Wetland 160	Moderate	5	0.91
Wetland 161	Moderate	5	2.95
Wetland 191	Moderate	5	2.31

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 208	Moderate	5	0.10
Wetland 210	Moderate	5	1.54
Wetland 2783	Moderate	3	21.00
Wetland 51	Moderate	3	37.00



Deschutes Watershed Characterization

West Budd Subwatershed Combined Ecological Process and Site Ranking - Wetlands

Legend

- Urban Growth Boundary
- Project Area
- Drainage Analysis Unit - DAU
- West Budd Subwatershed

Environmental Enhancement Benefit

- 6 - Highest
- 5
- 4
- 3
- 2
- 1
- 0 - Lowest

Ranking		
Ecological Processes	Resource Sites	Total Score
High	High	6
High	Moderate	5
Moderate	High	4
Moderate	Moderate	3
Low	High	2
Low	Moderate	1
N/A	Low	0

0 0.25 0.5 1 1.5 Miles

0 0.25 0.5 1 1.5 Kilometers

Thurston GeoData Center

Data: Thurston Geodata Center, 2000-10
WDFW 2003, 2006; BIOERP 2009
Production: Thurston Geodata Center
October 2010, OFR
WestBudd_Combined_Eco_and_Site_Scoring_Wetlands.mxd

Figure 13.3 West Budd Subwatershed Ecological Processes and Site Ranking - Wetlands

Riparian

The resulting combined score of the natural resource site within the context of the DAU were scored and displayed on the map Figure 13.4 West Budd Subwatershed Ecological Processes and Site Ranking – Riparian. Riparian sites ranked Low are not included in the table, but are ranked and available in appendix B.

Table 13.4 Riparian Sites

Site ID	Riparian Rank	Combined DAU and Site Score	Acres
Riparian 53	High	6	17.18
Riparian 61	High	6	54.17
Riparian 85	Moderate	5	31.97
Riparian 49	Moderate	5	11.85

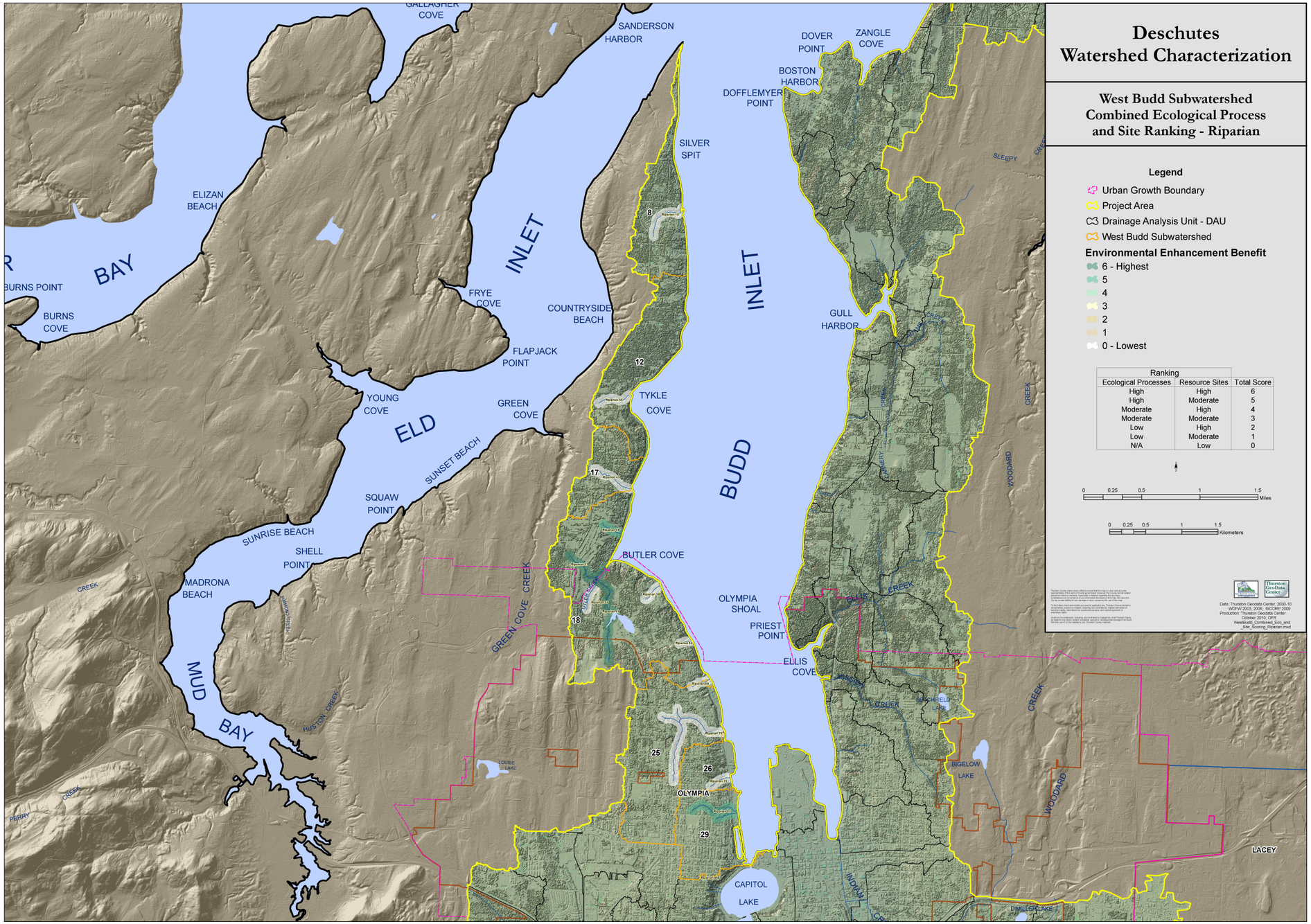


Figure 13.4 West Budd Subwatershed Ecological Processes and Site Ranking - Riparian

Floodplain Condition

There is no regulated floodplain in the West Budd subwatershed.