

Table of Contents

Part I.	What are the Landscape Conditions in East Budd?	1
Part II.	Characterize Condition of Ecological Processes in Study Area	3
Part III.	Characterize Natural Resource Sites in Study Area	7
Part IV.	Assess Potential Sites within the DAU	7

List of Tables

Table 12.0	East Budd Ecological and Biological Function	3
Table 12.1	Final DAU Ecological Benefit Rank	4
Table 12.2	East Budd Environmental Benefit Ranking of Natural Resource Sites	7
Table 11.3	Combined Ranking Score	7
Table 12.4	Wetland Sites	8
Table 12.5	Riparian Sites	13

Table of Figures

Figure 12.0	Classification Percent Totals for East Budd Subwatershed	1
Figure 12.1	East Budd Subwatershed Land Cover	2
Figure 12.2	East Budd Subwatershed Ecological Function	6
Figure 12.3	East Budd Combined Ecological Processes and Resource Site Ranking - Wetlands	12
Figure 12.4	East Budd Ecological Processes and Site Ranking - Riparian	14

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 East 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 11% of the East Budd Subwatershed is covered by urban land uses (see Figure 12.0 and 12.1 Classification Percent Totals for East Budd Subwatershed).

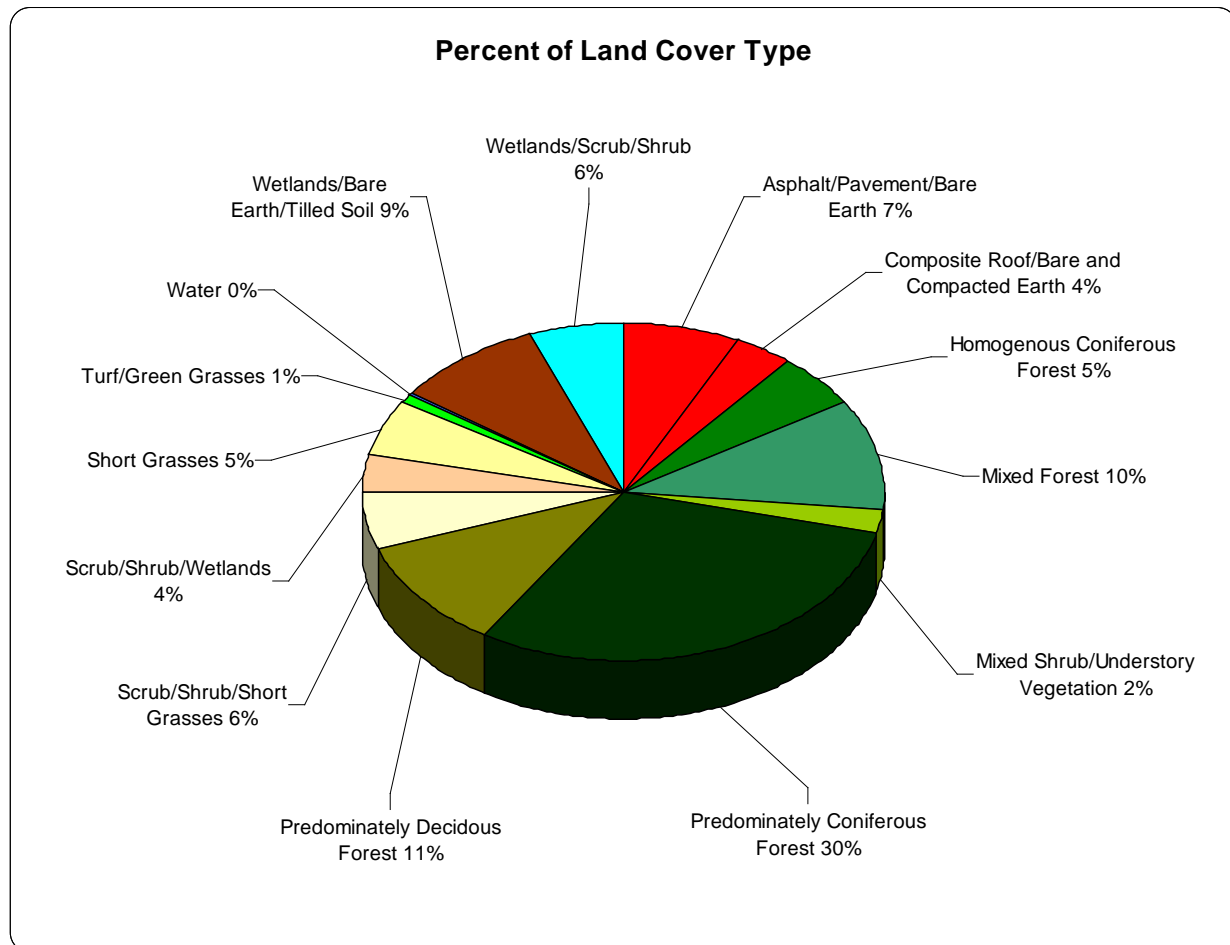


Figure 12.0 Classification Percent Totals for East Budd Subwatershed
Land cover data from 2009 SPOT imagery.



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 21 DAUs totaling 5,352 acres (8 sq miles) in the East 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 12.0 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 12.0 East Budd Ecological and Biological Function

DAU Id	Acres	Sq Mi	Aquatic Integrity	Habitat Connectivity	Water	Sediment	Wood	Pollutants	Heat
1	159	0.25	N/A	AR	AR	AR	AR	N/A	AR
2	225	0.35	N/A	PF	AR	AR	PF	PF	AR
3	237	0.37	N/A	PF	AR	AR	PF	N/A	AR
4	170	0.27	N/A	AR	AR	AR	AR	N/A	AR
5	167	0.26	N/A	PF	AR	AR	PF	N/A	AR
6	425	0.66	N/A	PF	AR	AR	PF	N/A	AR
7	145	0.23	N/A	PF	PF	AR	PF	AR	AR
9	103	0.16	N/A	PF	PF	AR	PF	AR	AR
10	296	0.46	N/A	AR	AR	AR	AR	N/A	AR
11	201	0.31	N/A	AR	AR	AR	NPF	N/A	NPF
13	205	0.32	N/A	AR	AR	AR	AR	NPF	AR
14	96	0.15	N/A	PF	AR	AR	PF	AR	AR
15	484	0.76	N/A	AR	AR	AR	AR	N/A	AR

DAU Id	Acres	Sq Mi	Aquatic Integrity	Habitat Connectivity	Water	Sediment	Wood	Pollutants	Heat
16	349	0.54	AR	AR	AR	AR	AR	N/A	AR
19	173	0.27	N/A	AR	PF	AR	AR	NPF	AR
20	327	0.51	N/A	AR	AR	AR	AR	N/A	AR
21	280	0.44	N/A	AR	AR	AR	AR	N/A	AR
22	259	0.40	AR	AR	AR	AR	AR	N/A	AR
23	381	0.59	AR	AR	AR	AR	AR	N/A	AR
24	425	0.66	AR	AR	AR	AR	AR	AR	AR
27	262	0.41	N/A	NPF	AR	AR	NPF	AR	AR

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 12.1 illustrates the final ecological and biological function rank of each DAU

Table 12.1 Final DAU Ecological and Biological Benefit Rank

DAU Id	Ecological Processes					Biological Elements		Total Score	Rank
	Water	Sediment	Wood	Pollutants	Heat	Aquatic Integrity	Habitat		
24	3	1	2	1	1	1	1	10	High
16	3	1	2	0	1	1	1	9	High
22	3	1	2	0	1	1	1	9	High
23	3	1	2	0	1	1	1	9	High
1	3	1	2	0	1	0	1	8	High
4	3	1	2	0	1	0	1	8	High
10	3	1	2	0	1	0	1	8	High
13	3	1	2	0	1	0	1	8	High
15	3	1	2	0	1	0	1	8	High
20	3	1	2	0	1	0	1	8	High
21	3	1	2	0	1	0	1	8	High
14	3	1	0	1	1	0	0	6	Moderate
27	3	1	0	1	1	0	0	6	Moderate
2	3	1	0	0	1	0	0	5	Moderate
3	3	1	0	0	1	0	0	5	Moderate
5	3	1	0	0	1	0	0	5	Moderate
6	3	1	0	0	1	0	0	5	Moderate
11	3	1	0	0	0	0	1	5	Moderate
19	0	1	2	0	1	0	1	5	Moderate
7	0	1	0	1	1	0	0	3	Moderate
9	0	1	0	1	1	0	0	3	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. East Budd has 21 DAUs that have restoration potential (Figure 12.2 East Budd Subwatershed Ecological Function).

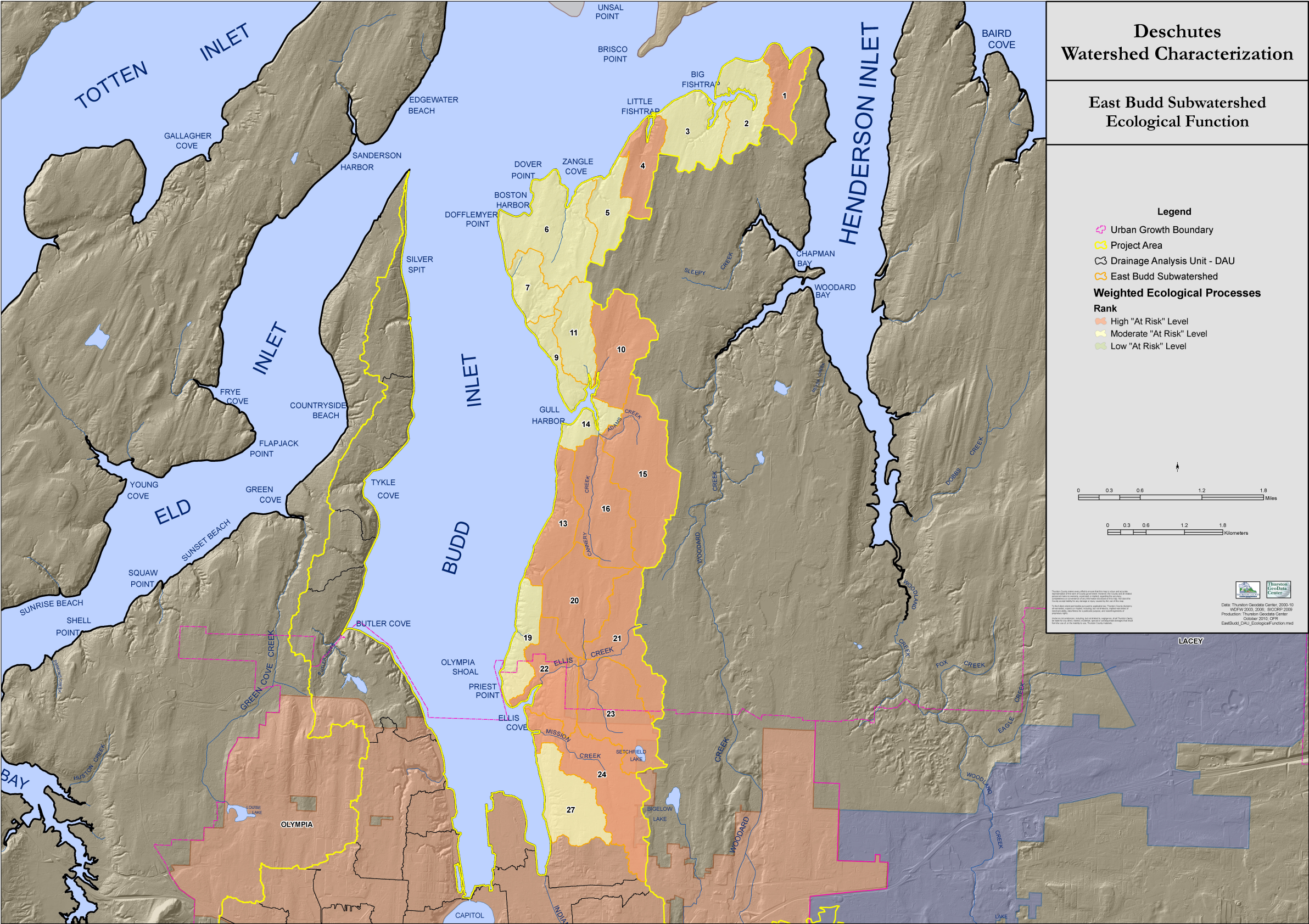


Figure 12.2 East Budd Subwatershed Ecological Function

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 255 potential restoration or enhancement sites. Table 12.1 details the results.

Table 12.1 East Budd Environmental Benefit Ranking of Natural Resource Sites

East Budd Potential Restoration Sites				
Rank	Wetland	Riparian	Floodplain	Total
High	49	4	0	53
Medium	99	10	0	109
Low	83	10	0	93

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 11.2 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 11.2 Combined Ranking Score

Ecological Benefit (DAU)	Environmental Benefit (Resource Site)	Total Score
High	High	6
High	Moderate	5
Moderate	High	4

Ecological Benefit (DAU)	Environmental Benefit (Resource Site)	Total Score
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 255 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 12.3 presents the results of wetland restoration site ranking taking into account the combined wetland restoration potential and the DAU ranking. Figure 12.4 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 upon request.

Table 12.3 Wetland Sites

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 63	High	6	34.55
Wetland 241	High	6	7.27
Wetland 2770	High	6	6.89
Wetland 150	High	6	7.76
Wetland 204	High	6	0.90
Wetland 82	High	6	34.08
Wetland 89	High	6	2.11
Wetland 91	High	6	1.08
Wetland 92	High	6	9.60
Wetland 94	High	6	3.32
Wetland 157	High	6	2.94
Wetland 2777	High	6	41.27
Wetland 2778	High	6	5.42
Wetland 244	High	6	0.82
Wetland 246	High	6	0.09
Wetland 126	High	6	3.14
Wetland 2781	High	6	3.37
Wetland 96	High	6	5.99
Wetland 125	High	6	2.17
Wetland 132	High	6	1.39
Wetland 143	High	6	0.39

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 144	High	6	16.49
Wetland 10	High	6	0.80
Wetland 121	High	6	1.08
Wetland 177	High	6	42.89
Wetland 47	High	6	1.13
Wetland 69	High	6	3.95
Wetland 73	High	6	6.97
Wetland 74	High	6	1.90
Wetland 85	High	6	2.22
Wetland 104	High	6	1.57
Wetland 115	High	6	16.58
Wetland 117	High	6	0.61
Wetland 124	High	6	0.97
Wetland 127	High	6	2.37
Wetland 164	High	6	0.76
Wetland 171	High	6	1.40
Wetland 196	High	6	0.19
Wetland 209	High	6	3.10
Wetland 214	High	6	5.36
Wetland 234	High	6	5.72
Wetland 2774	High	6	12.81
Wetland 2779	High	6	6.29
Wetland 145	Moderate	5	0.30
Wetland 2780	Moderate	5	2.94
Wetland 65	Moderate	5	28.28
Wetland 140	Moderate	5	0.04
Wetland 141	Moderate	5	0.36
Wetland 158	Moderate	5	1.09
Wetland 59	Moderate	5	10.87
Wetland 86	Moderate	5	0.40
Wetland 110	Moderate	5	0.44
Wetland 111	Moderate	5	1.14
Wetland 113	Moderate	5	1.36
Wetland 134	Moderate	5	1.76
Wetland 135	Moderate	5	1.95
Wetland 149	Moderate	5	19.59
Wetland 151	Moderate	5	0.56
Wetland 168	Moderate	5	4.19
Wetland 184	Moderate	5	0.38
Wetland 186	Moderate	5	0.62
Wetland 212	Moderate	5	0.72
Wetland 233	Moderate	5	0.28
Wetland 237	Moderate	5	2.15
Wetland 238	Moderate	5	1.67
Wetland 146	Moderate	5	0.58
Wetland 166	Moderate	5	6.91
Wetland 180	Moderate	5	33.19
Wetland 215	Moderate	5	3.11
Wetland 239	Moderate	5	0.36

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 2782	Moderate	5	6.02
Wetland 49	Moderate	5	8.02
Wetland 62	Moderate	5	0.91
Wetland 64	Moderate	5	1.50
Wetland 119	Moderate	5	0.86
Wetland 120	Moderate	5	0.28
Wetland 122	Moderate	5	23.81
Wetland 167	Moderate	5	16.19
Wetland 178	Moderate	5	0.60
Wetland 179	Moderate	5	2.26
Wetland 206	Moderate	5	3.64
Wetland 138	Moderate	5	0.11
Wetland 182	Moderate	5	0.01
Wetland 11	Moderate	5	2.25
Wetland 54	Moderate	5	15.00
Wetland 58	Moderate	5	1.12
Wetland 84	Moderate	5	3.68
Wetland 100	Moderate	5	19.74
Wetland 102	Moderate	5	4.93
Wetland 116	Moderate	5	4.29
Wetland 156	Moderate	5	0.45
Wetland 185	Moderate	5	45.03
Wetland 197	Moderate	5	43.03
Wetland 50	Moderate	5	1.81
Wetland 60	Moderate	5	0.98
Wetland 68	Moderate	5	0.48
Wetland 77	Moderate	5	0.83
Wetland 78	Moderate	5	0.67
Wetland 83	Moderate	5	20.67
Wetland 87	Moderate	5	3.41
Wetland 99	Moderate	5	0.19
Wetland 101	Moderate	5	0.22
Wetland 107	Moderate	5	1.56
Wetland 109	Moderate	5	0.22
Wetland 112	Moderate	5	0.47
Wetland 128	Moderate	5	3.39
Wetland 129	Moderate	5	1.07
Wetland 133	Moderate	5	0.61
Wetland 136	Moderate	5	0.20
Wetland 137	Moderate	5	0.29
Wetland 147	Moderate	5	0.11
Wetland 148	Moderate	5	0.04
Wetland 175	Moderate	5	0.31
Wetland 198	Moderate	5	0.31
Wetland 199	Moderate	5	0.79
Wetland 216	Moderate	5	0.07
Wetland 226	Moderate	5	0.75
Wetland 240	Moderate	5	3.04
Wetland 248	Moderate	5	0.18

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 251	Moderate	5	0.12
Wetland 43	High	4	67.61
Wetland 45	High	4	9.70
Wetland 26	High	4	22.67
Wetland 44	High	4	4.06
Wetland 159	High	4	1.39
Wetland 162	High	4	1.60
Wetland 53	Moderate	3	1.35
Wetland 14	Moderate	3	0.74
Wetland 18	Moderate	3	0.26
Wetland 17	Moderate	3	0.58
Wetland 19	Moderate	3	4.02
Wetland 32	Moderate	3	0.70
Wetland 40	Moderate	3	1.06
Wetland 130	Moderate	3	1.26
Wetland 20	Moderate	3	0.08
Wetland 131	Moderate	3	1.11
Wetland 5	Moderate	3	1.05
Wetland 30	Moderate	3	13.21
Wetland 55	Moderate	3	0.30
Wetland 24	Moderate	3	1.33
Wetland 27	Moderate	3	5.01
Wetland 29	Moderate	3	0.17
Wetland 34	Moderate	3	28.77
Wetland 52	Moderate	3	1.81
Wetland 56	Moderate	3	0.28
Wetland 152	Moderate	3	0.96
Wetland 2775	Moderate	3	8.93
Wetland 2776	Moderate	3	5.85



Riparian condition

The resulting combined score of the natural resource site within the context of the DAU were scored and displayed on the map Figure 12.4 East 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 12.4 Riparian Sites

Site ID	Riparian Rank	Combined DAU and Site Score	Acres
Riparian 66	High	6	61.57
Riparian 3	High	6	26.94
Riparian 35	High	6	58.47
Riparian 37	Moderate	5	58.93
Riparian 3443	Moderate	5	4.86
Riparian 56	Moderate	5	47.20
Riparian 57	Moderate	5	29.87
Riparian 62	Moderate	5	38.15
Riparian 6	Moderate	5	10.62
Riparian 47	Moderate	5	13.27
Riparian 71	Moderate	5	89.73
Riparian 2	High	4	23.01
Riparian 3456	Moderate	3	33.61
Riparian 3457	Moderate	3	14.78

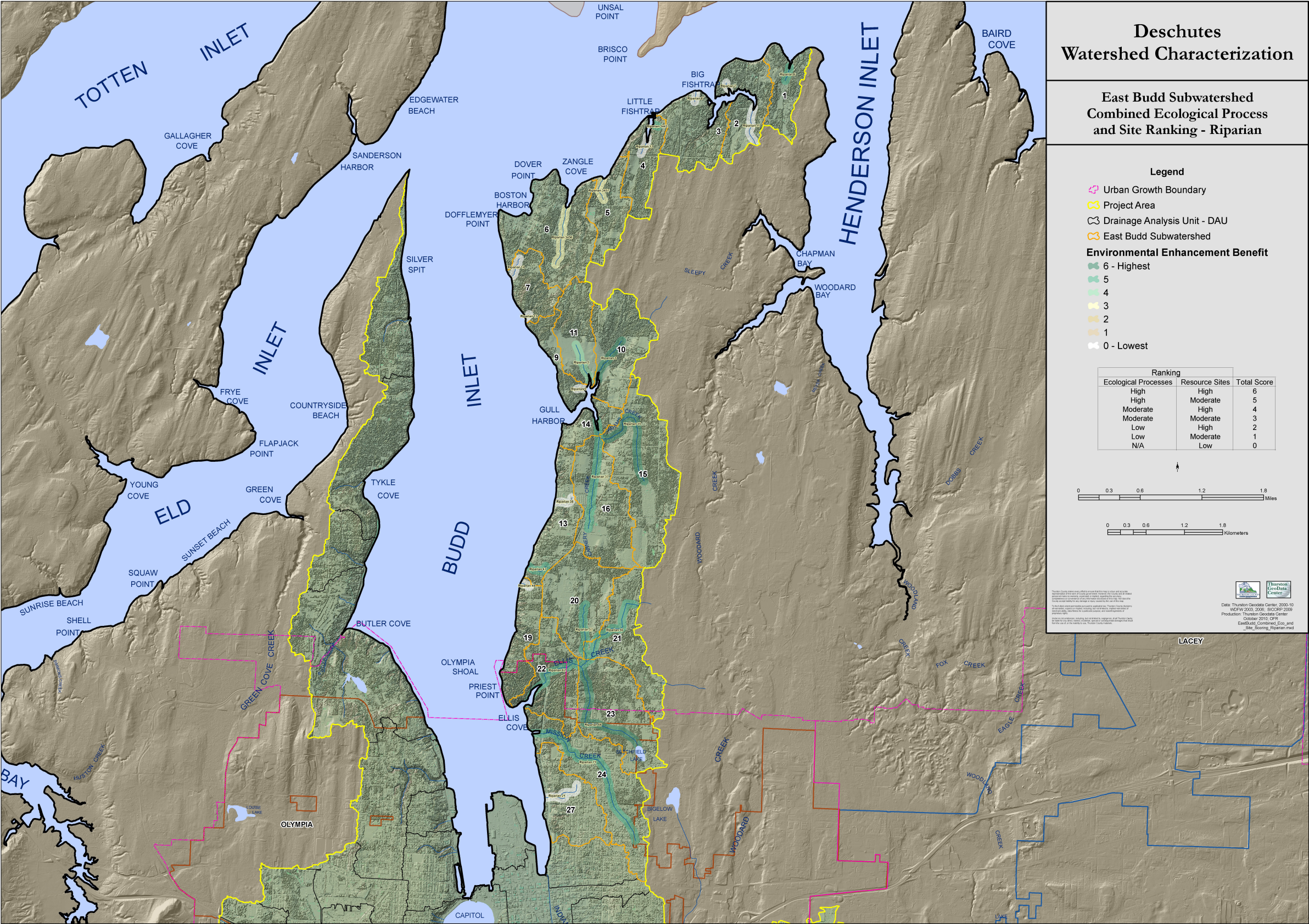


Figure 12.4 East Budd Ecological Processes and Site Ranking - Riparian

Floodplain Condition

There are no floodplain sites in the East Budd Subwatershed.