

Table of Contents

Part I.	What are the Landscape Conditions in the Lawrence Lake Subwatershed?	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 3.0	Lawrence Lake Ecological Processes Function	3
Table 3.1	Final DAU Ecological Benefit Rank	4
Table 3.2	Lawrence Lake Environmental Benefit Ranking of Natural Resource Sites	7
Table 3.3	Wetland Sites	8
Table 3.4	Riparian Sites	14
Table 3.5	Floodplain Sites	17

Table of Figures

Figure 3.0	Classification Percent Totals for Lawrence Lake Subwatershed	1
Figure 3.1	Lawrence Lake Subwatershed Land Cover	2
Figure 3.2	Lawrence Lake Subwatershed Ecological Function	6
Figure 3.3	Lawrence Lake Subwatershed Ecological Processes and Site Ranking – Wetlands	13
Figure 3.4	Lawrence Lake Subwatershed Ecological Processes and Site Ranking – Riparian	16
Figure 3.5	Lawrence Lake Subwatershed Ecological Processes and Site Ranking - Floodplain	18

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 the Lawrence Lake Subwatershed?

Current conditions

Current land-use within the Lawrence lake sub-watershed was determined by processing Aerial photography and SPOT 10 meter satellite imagery captured in 2009. Approximately four percent of the Lawrence Lake Subwatershed is covered by the built environment (see Figure 3.0 and 3.1 Classification Percent Totals for Lawrence Lake Subwatershed). Lawrence Lake is surrounded by residential development. Long-term commercial forestry is also prominent in the subwatershed.

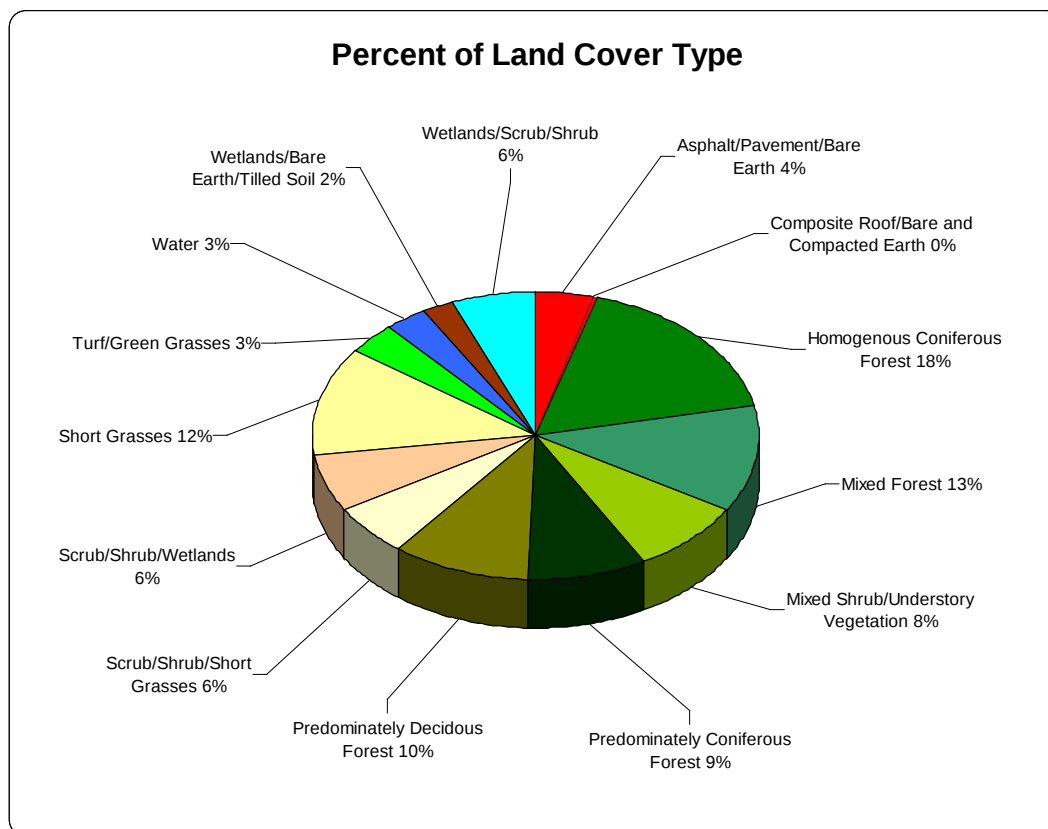


Figure 3.0 Classification Percent Totals for Lawrence Lake Subwatershed
Land cover data from 2009 SPOT imagery.



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 22 DAUs totaling 9,375 acres (15 sq miles) in the subwatershed.

Determine the 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 3.0 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 3.0 Lawrence Lake Ecological Processes and Biological Elements Function

DAU Id	Acres	Sq Mi	Aquatic Integrity	Habitat Connectivity	Water	Sediment	Wood	Pollutants	Heat
185	479	0.75	N/A	NPF	AR	AR	NPF	AR	AR
188	239	0.37	N/A	AR	AR	AR	NPF	N/A	AR
193	926	1.45	N/A	AR	AR	PF	NPF	N/A	AR
194	1371	2.14	N/A	AR	AR	AR	NPF	AR	AR
197	400	0.62	N/A	AR	AR	PF	AR	N/A	AR
198	181	0.28	N/A	AR	AR	PF	NPF	N/A	AR
201	322	0.50	N/A	AR	AR	AR	AR	N/A	AR
203	324	0.51	N/A	AR	AR	AR	NPF	N/A	AR
204	164	0.26	N/A	AR	AR	PF	NPF	N/A	AR
207	166	0.26	N/A	AR	PF	AR	AR	N/A	AR
208	259	0.40	N/A	AR	AR	AR	AR	N/A	AR
209	321	0.50	N/A	AR	PF	PF	AR	N/A	AR
210	228	0.36	N/A	AR	AR	PF	AR	N/A	AR

DAU Id	Acres	Sq Mi	Aquatic Integrity	Habitat Connectivity	Water	Sediment	Wood	Pollutants	Heat
211	343	0.54	N/A	AR	AR	PF	AR	N/A	AR
212	214	0.33	N/A	AR	AR	PF	AR	N/A	AR
213	425	0.66	N/A	AR	AR	PF	AR	N/A	AR
214	354	0.55	N/A	AR	PF	PF	AR	N/A	AR
218	800	1.25	N/A	AR	PF	PF	AR	N/A	AR
220	205	0.32	N/A	AR	AR	AR	AR	N/A	AR
222	587	0.92	N/A	AR	PF	AR	AR	N/A	AR
223	342	0.53	N/A	PF	PF	PF	PF	N/A	PF
224	735	1.15	N/A	AR	PF	PF	AR	N/A	AR

Once the DAU ecological processes and biological function levels are ascertained, the function levels are translated to a ranking scheme. Ecological processes and biological elements which have been identified as "At Risk" are scored higher based upon the potential for enhancement from restored/rehabilitated marginal function levels. The ecological process scores are then ranked according to the weight criteria, and converted to a High, Moderate, or Low process rank.

Table 3.1 details the final ecological and biological benefit rank of each DAU.

Table 3.1 Final DAU Ecological Benefit Rank

DAU Id	Ecological Processes					Biological Elements		Total Score	Rank
	Water	Sediment	Wood	Pollutants	Heat	Aquatic Integrity	Habitat		
201	3	1	2	0	1	0	1	8	High
208	3	1	2	0	1	0	1	8	High
220	3	1	2	0	1	0	1	8	High
194	3	1	0	1	1	0	1	7	High
197	3	0	2	0	1	0	1	7	High
210	3	0	2	0	1	0	1	7	High
211	3	0	2	0	1	0	1	7	High
212	3	0	2	0	1	0	1	7	High
213	3	0	2	0	1	0	1	7	High
185	3	1	0	1	1	0	0	6	Moderate
188	3	1	0	0	1	0	1	6	Moderate
203	3	1	0	0	1	0	1	6	Moderate
193	3	0	0	0	1	0	1	5	Moderate
198	3	0	0	0	1	0	1	5	Moderate
204	3	0	0	0	1	0	1	5	Moderate
207	0	1	2	0	1	0	1	5	Moderate
222	0	1	2	0	1	0	1	5	Moderate
209	0	0	2	0	1	0	1	4	Moderate
214	0	0	2	0	1	0	1	4	Moderate
218	0	0	2	0	1	0	1	4	Moderate

DAU Id	Ecological Processes					Biological Elements		Total Score	Rank
	Water	Sediment	Wood	Pollutants	Heat	Aquatic Integrity	Habitat		
224	0	0	2	0	1	0	1	4	Moderate
223	0	0	0	0	0	0	0	0	Low

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. Lawrence Lake subwatershed has 22 DAUs that have restoration potential (Figure 3.2 Lawrence Lake Subwatershed Ecological Function)

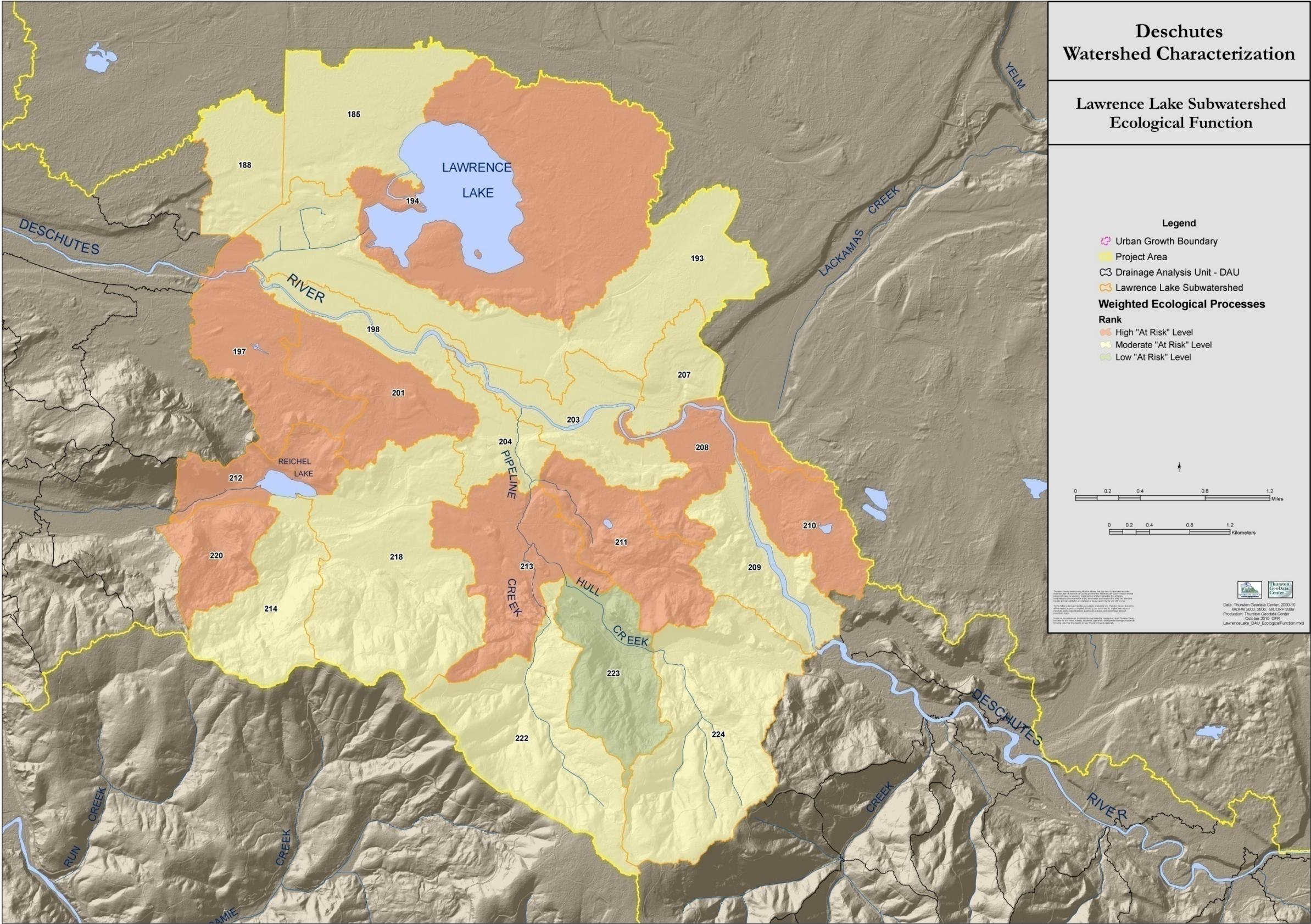


Figure 3.2 Lawrence Lake Subwatershed Ecological Function

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

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 388 potential restoration or enhancement sites. Table 3.2 details the results.

Table 3.1 Lawrence Lake Environmental Benefit Ranking of Natural Resource Sites

Lawrence Lake Potential Restoration Sites				
Rank	Wetland	Riparian	Floodplain	Total
High	74	28	4	110
Medium	131	24	3	158
Low	95	25	0	120

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 3.2 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 3.2 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 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. Wetland sites less than one acre are not included in the table, but are ranked and available upon request. The following tables include the natural resource environmental score and rank, as well as the combined score when placed in the DAU.

Wetland sites

Table 3.3 presents the results of wetland restoration site ranking taking into account the combined wetland restoration potential and the DAU ranking. Figure 3.3 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 3.3 Wetland Sites

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 2829	High	6	11.59
Wetland 2174	High	6	6.94
Wetland 2835	High	6	8.06
Wetland 2411	High	6	1.90
Wetland 2051	High	6	316.07
Wetland 2248	High	6	13.49
Wetland 2827	High	6	11.15
Wetland 2437	High	6	10.83
Wetland 2283	High	6	8.62
Wetland 2080	High	6	2.26
Wetland 2190	High	6	0.78
Wetland 2355	High	6	0.44
Wetland 2366	High	6	0.40
Wetland 2143	High	6	0.37
Wetland 2448	High	6	0.17
Wetland 2276	High	6	12.03
Wetland 2826	High	6	9.74

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 2282	High	6	5.68
Wetland 2183	High	6	3.31
Wetland 2256	High	6	3.23
Wetland 2117	High	6	0.88
Wetland 2481	High	6	0.68
Wetland 2523	High	6	0.48
Wetland 2086	High	6	0.46
Wetland 2254	High	6	0.43
Wetland 2431	High	6	0.40
Wetland 2472	High	6	0.20
Wetland 2407	High	6	0.15
Wetland 2429	High	6	0.14
Wetland 2088	High	6	0.13
Wetland 2516	Moderate	5	4.57
Wetland 2433	Moderate	5	4.48
Wetland 2841	Moderate	5	3.88
Wetland 2285	Moderate	5	3.50
Wetland 2186	Moderate	5	3.31
Wetland 2412	Moderate	5	3.02
Wetland 2300	Moderate	5	1.79
Wetland 2528	Moderate	5	1.57
Wetland 2413	Moderate	5	1.51
Wetland 2476	Moderate	5	1.42
Wetland 2436	Moderate	5	1.34
Wetland 2493	Moderate	5	0.79
Wetland 2418	Moderate	5	0.76
Wetland 2520	Moderate	5	0.73
Wetland 2367	Moderate	5	0.71
Wetland 2469	Moderate	5	0.53
Wetland 2482	Moderate	5	0.42
Wetland 2514	Moderate	5	0.41
Wetland 2403	Moderate	5	0.24
Wetland 2297	Moderate	5	0.11
Wetland 2148	Moderate	5	14.65
Wetland 2435	Moderate	5	7.97
Wetland 2277	Moderate	5	4.20
Wetland 2384	Moderate	5	3.69
Wetland 2156	Moderate	5	2.77
Wetland 2335	Moderate	5	1.90
Wetland 2264	Moderate	5	1.55
Wetland 2451	Moderate	5	1.31
Wetland 2489	Moderate	5	0.48
Wetland 2320	Moderate	5	0.38
Wetland 2508	Moderate	5	0.34
Wetland 2526	Moderate	5	0.32
Wetland 2214	Moderate	5	0.28
Wetland 2171	Moderate	5	60.85
Wetland 2428	Moderate	5	7.63
Wetland 2398	Moderate	5	3.31

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 2178	Moderate	5	1.54
Wetland 2369	Moderate	5	1.10
Wetland 2236	Moderate	5	1.06
Wetland 2375	Moderate	5	0.80
Wetland 2241	Moderate	5	0.67
Wetland 2389	Moderate	5	0.66
Wetland 2159	Moderate	5	0.63
Wetland 2426	Moderate	5	0.55
Wetland 2358	Moderate	5	0.53
Wetland 2891	Moderate	5	0.42
Wetland 2509	Moderate	5	0.38
Wetland 2378	Moderate	5	0.29
Wetland 2157	Moderate	5	0.28
Wetland 2397	Moderate	5	0.26
Wetland 2142	Moderate	5	0.23
Wetland 2161	Moderate	5	0.16
Wetland 2890	Moderate	5	0.10
Wetland 2889	Moderate	5	0.09
Wetland 2830	High	4	22.19
Wetland 2377	High	4	15.37
Wetland 2118	High	4	12.51
Wetland 2252	High	4	4.36
Wetland 2202	High	4	129.06
Wetland 2144	High	4	24.33
Wetland 2154	High	4	15.71
Wetland 2833	High	4	6.28
Wetland 2134	High	4	5.51
Wetland 2239	High	4	156.10
Wetland 2439	High	4	16.68
Wetland 2371	High	4	6.50
Wetland 2233	High	4	1.46
Wetland 2900	High	4	1.41
Wetland 2368	High	4	1.12
Wetland 2385	High	4	1.06
Wetland 2376	High	4	0.85
Wetland 2886	High	4	0.58
Wetland 2445	High	4	0.28
Wetland 2109	High	4	45.64
Wetland 2831	High	4	22.68
Wetland 2257	High	4	9.38
Wetland 2506	High	4	1.82
Wetland 2410	High	4	1.09
Wetland 2495	High	4	0.59
Wetland 2374	High	4	0.58
Wetland 2502	High	4	0.51
Wetland 2135	High	4	0.47
Wetland 2521	High	4	0.26
Wetland 2540	High	4	0.00
Wetland 2400	High	4	4.59

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 2832	High	4	4.40
Wetland 2210	High	4	2.96
Wetland 2269	High	4	2.61
Wetland 2423	High	4	1.95
Wetland 2404	High	4	1.73
Wetland 2420	High	4	1.21
Wetland 2901	High	4	1.13
Wetland 2503	High	4	0.73
Wetland 2424	High	4	0.55
Wetland 2325	High	4	0.32
Wetland 2077	High	4	0.18
Wetland 1605	Moderate	3	55.95
Wetland 2147	Moderate	3	41.39
Wetland 2834	Moderate	3	8.60
Wetland 2255	Moderate	3	6.52
Wetland 2405	Moderate	3	5.24
Wetland 2026	Moderate	3	3.80
Wetland 2015	Moderate	3	3.35
Wetland 2519	Moderate	3	3.12
Wetland 2454	Moderate	3	2.59
Wetland 2207	Moderate	3	2.26
Wetland 2187	Moderate	3	1.49
Wetland 2288	Moderate	3	1.39
Wetland 2458	Moderate	3	1.19
Wetland 2196	Moderate	3	1.15
Wetland 2120	Moderate	3	0.98
Wetland 2380	Moderate	3	0.91
Wetland 2193	Moderate	3	0.91
Wetland 2084	Moderate	3	0.82
Wetland 2263	Moderate	3	0.68
Wetland 2406	Moderate	3	0.49
Wetland 2262	Moderate	3	0.33
Wetland 2441	Moderate	3	0.24
Wetland 2103	Moderate	3	0.10
Wetland 2238	Moderate	3	6.82
Wetland 2457	Moderate	3	3.89
Wetland 2170	Moderate	3	2.68
Wetland 2497	Moderate	3	2.68
Wetland 2565	Moderate	3	1.89
Wetland 2286	Moderate	3	1.50
Wetland 2169	Moderate	3	1.09
Wetland 2902	Moderate	3	0.84
Wetland 2513	Moderate	3	0.78
Wetland 2453	Moderate	3	0.53
Wetland 2894	Moderate	3	0.47
Wetland 2101	Moderate	3	0.44
Wetland 2414	Moderate	3	0.27
Wetland 2499	Moderate	3	0.22
Wetland 2082	Moderate	3	11.02

Site ID	Wetlands Rank	Combined DAU Site Score	Acres
Wetland 2561	Moderate	3	6.01
Wetland 2223	Moderate	3	5.69
Wetland 2579	Moderate	3	4.18
Wetland 2557	Moderate	3	2.72
Wetland 2545	Moderate	3	2.52
Wetland 2446	Moderate	3	2.05
Wetland 2893	Moderate	3	1.97
Wetland 2309	Moderate	3	1.76
Wetland 2168	Moderate	3	1.45
Wetland 2510	Moderate	3	1.44
Wetland 2247	Moderate	3	1.35
Wetland 2216	Moderate	3	1.15
Wetland 2365	Moderate	3	1.10
Wetland 2888	Moderate	3	1.01
Wetland 2222	Moderate	3	0.95
Wetland 2131	Moderate	3	0.91
Wetland 2898	Moderate	3	0.89
Wetland 2237	Moderate	3	0.85
Wetland 2547	Moderate	3	0.67
Wetland 2346	Moderate	3	0.64
Wetland 2370	Moderate	3	0.61
Wetland 2434	Moderate	3	0.59
Wetland 2007	Moderate	3	0.54
Wetland 2541	Moderate	3	0.50
Wetland 2895	Moderate	3	0.46
Wetland 2326	Moderate	3	0.42
Wetland 2391	Moderate	3	0.42
Wetland 2306	Moderate	3	0.40
Wetland 2566	Moderate	3	0.40
Wetland 2201	Moderate	3	0.39
Wetland 2316	Moderate	3	0.33
Wetland 2191	Moderate	3	0.33
Wetland 2361	Moderate	3	0.30
Wetland 2197	Moderate	3	0.27
Wetland 2467	Moderate	3	0.24
Wetland 2132	Moderate	3	0.05
Wetland 2176	Moderate	3	0.00
Wetland 2477	High	2	56.54
Wetland 2563	High	2	10.55
Wetland 2562	Moderate	1	0.90
Wetland 2583	Moderate	1	0.01



Riparian condition

The resulting combined score of the natural resource site within the context of the DAU were scored and displayed on Figure 3.4 Lawrence Lake Subwatershed Ecological Processes and Site Ranking – Riparian. Riparian sites ranked Low are not included in the following table, but can be found in appendix B.

Table 3.4 Riparian Sites

Site ID	Riparian Rank	Combined DAU and Site Score	Acres
Riparian 666	High	6	30.16
Riparian 3364	High	6	7.36
Riparian 948	High	6	5.55
Riparian 1006	High	6	7.28
Riparian 3365	High	6	22.59
Riparian 3368	High	6	7.08
Riparian 3394	High	6	3.97
Riparian 496	High	6	26.14
Riparian 512	High	6	20.01
Riparian 896	High	6	83.46
Riparian 3277	Moderate	5	43.06
Riparian 3352	Moderate	5	6.61
Riparian 3382	Moderate	5	195.79
Riparian 557	Moderate	5	19.54
Riparian 733	Moderate	5	28.17
Riparian 890	Moderate	5	10.54
Riparian 1050	Moderate	5	110.39
Riparian 675	Moderate	5	16.09
Riparian 541	Moderate	5	26.55
Riparian 1646	High	4	3.74
Riparian 3287	High	4	31.36
Riparian 540	High	4	33.25
Riparian 645	High	4	314.06
Riparian 1105	High	4	107.72
Riparian 1328	High	4	85.46
Riparian 3466	High	4	1.25
Riparian 555	High	4	8.22
Riparian 582	High	4	49.48
Riparian 619	High	4	38.88
Riparian 771	High	4	57.37
Riparian 1201	High	4	255.60
Riparian 1658	High	4	4.49
Riparian 3279	High	4	14.79
Riparian 542	High	4	1.68
Riparian 691	High	4	32.43
Riparian 808	High	4	28.07
Riparian 1102	Moderate	3	5.31
Riparian 3353	Moderate	3	7.87
Riparian 774	Moderate	3	240.95

Site ID	Riparian Rank	Combined DAU and Site Score	Acres
Riparian 790	Moderate	3	63.59
Riparian 1059	Moderate	3	24.19
Riparian 1070	Moderate	3	21.47
Riparian 715	Moderate	3	76.84
Riparian 827	Moderate	3	43.69
Riparian 913	Moderate	3	78.22
Riparian 924	Moderate	3	196.66
Riparian 1251	Moderate	3	60.22
Riparian 525	Moderate	3	12.03
Riparian 687	Moderate	3	11.08
Riparian 930	Moderate	3	107.49
Riparian 1223	High	2	2.27
Riparian 3369	Moderate	1	155.45

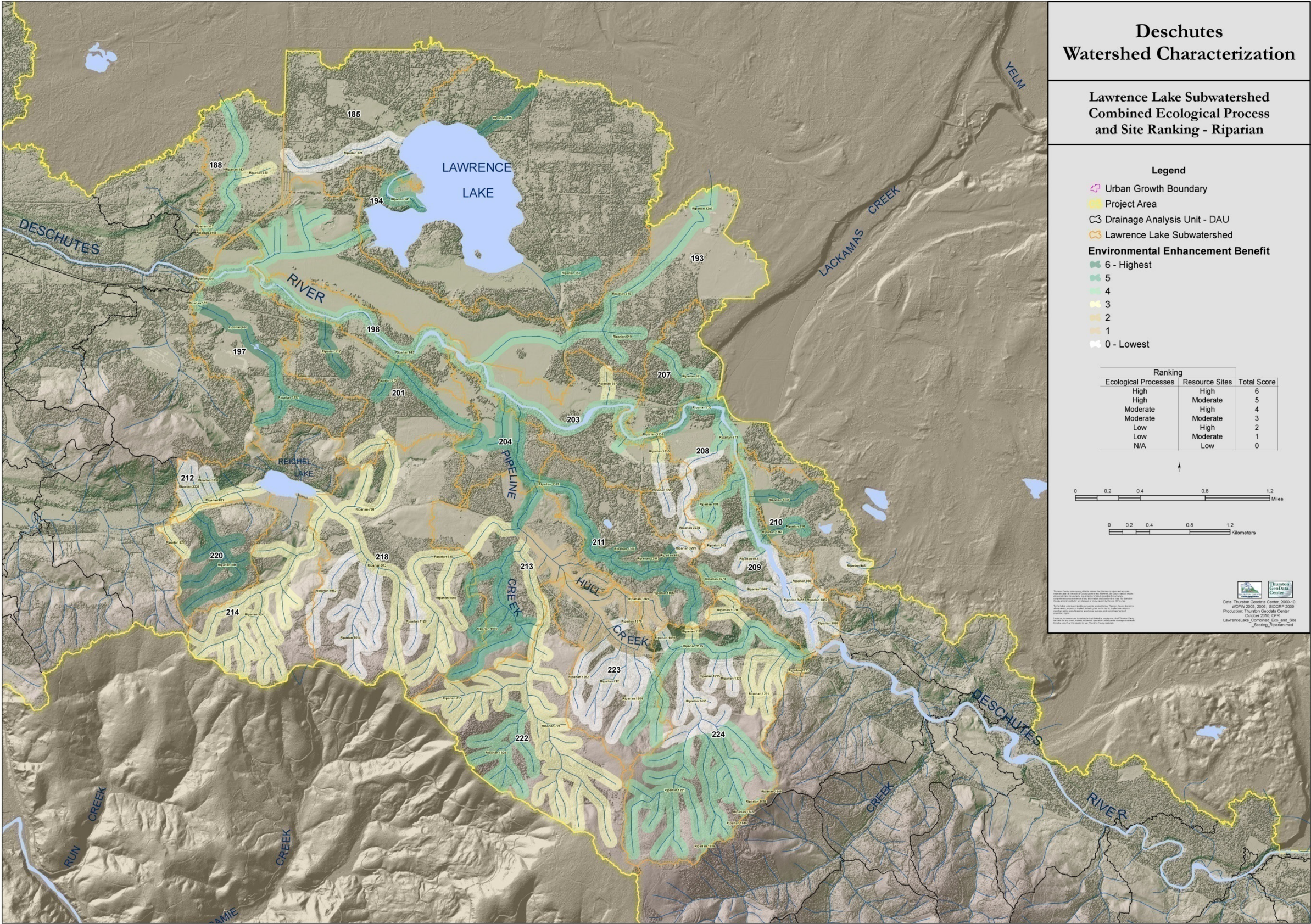


Figure 3.4 Lawrence Lake Subwatershed Ecological Processes and Site Ranking – Riparian

Floodplain Condition

The resulting combined score of the natural resource site within the context of the DAU were scored and displayed on the map Figure 3.5 Lawrence Lake Subwatershed Ecological Processes and Site Ranking – Floodplain. Floodplain sites ranked Low are not included in the following table, but can be found in appendix B.

Table 3.5 Floodplain Sites

Site ID	Floodplain Rank	Combined DAU Site Score	Acres
Floodplain 31	High	6	0.00
Floodplain 28	Moderate	5	21.42
Floodplain 38	Moderate	5	10.86
Floodplain 29	High	4	4.08

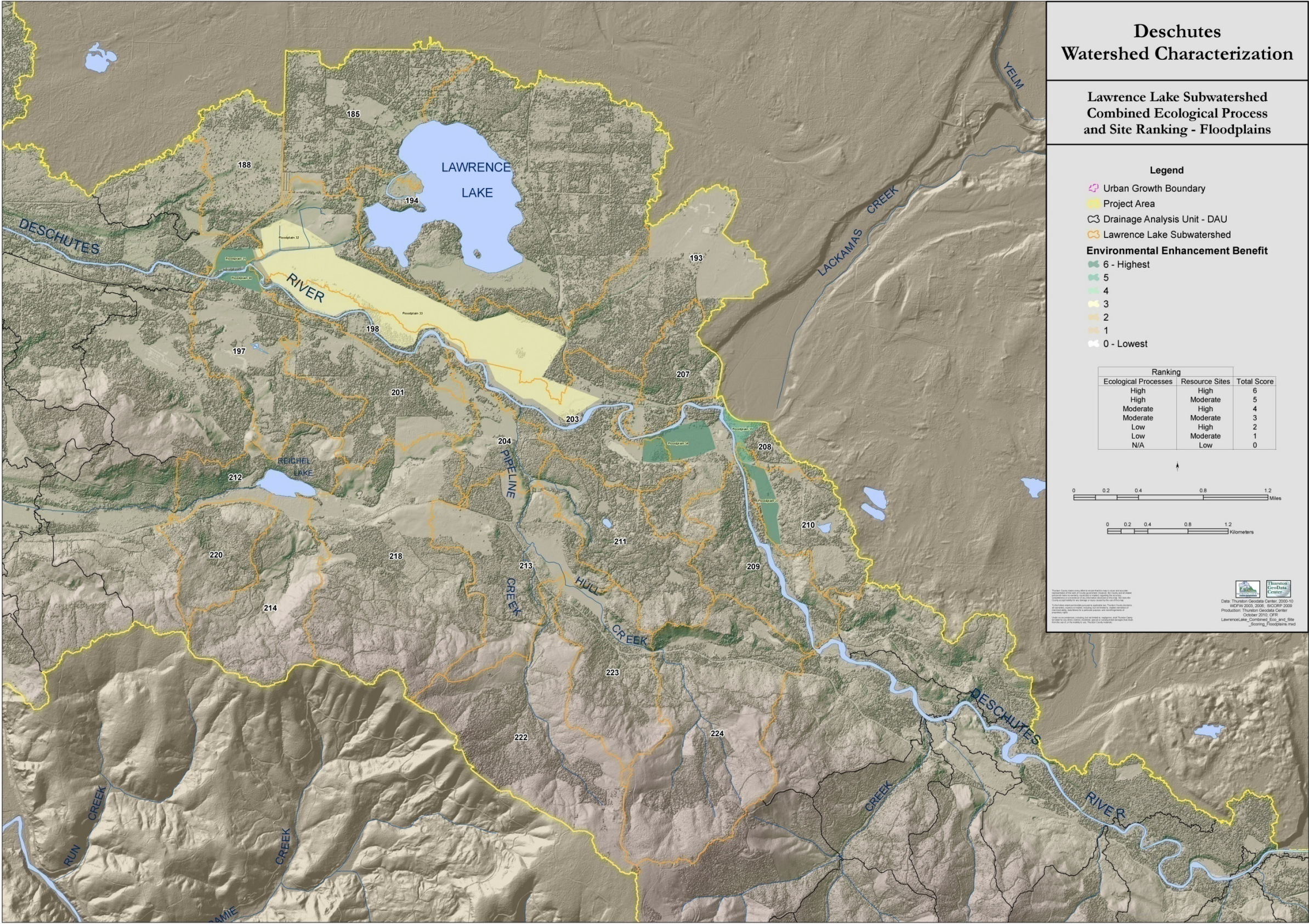


Figure 3.5 Lawrence Lake Subwatershed Ecological Processes and Site Ranking - Floodplain