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Introduction

This section summarizes the analysis methods used to develop the final prioritized list of natural resource (wetlands, riparian, and floodplain) restoration and/or enhancement sites and the results of that analysis for the Lake Saint Claire Study Area of the Nisqually Watershed. 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 Study Area.

Part I. What are the Landscape Conditions in the Lake St. Clair Study Area?

Current conditions

Current land-use within the Lake St. Clair Study Area was determined by processing Aerial photography and SPOT 10 meter satellite imagery captured in 2009. The results presented in Figures 6.0 and 6.1 indicate that approximately four percent of the Lake St Clair Study Area is covered by the built environment. The Lake Saint Clair Study Area has residential around the lake, but the ecological health has not been compromised to the point of not properly functioning.

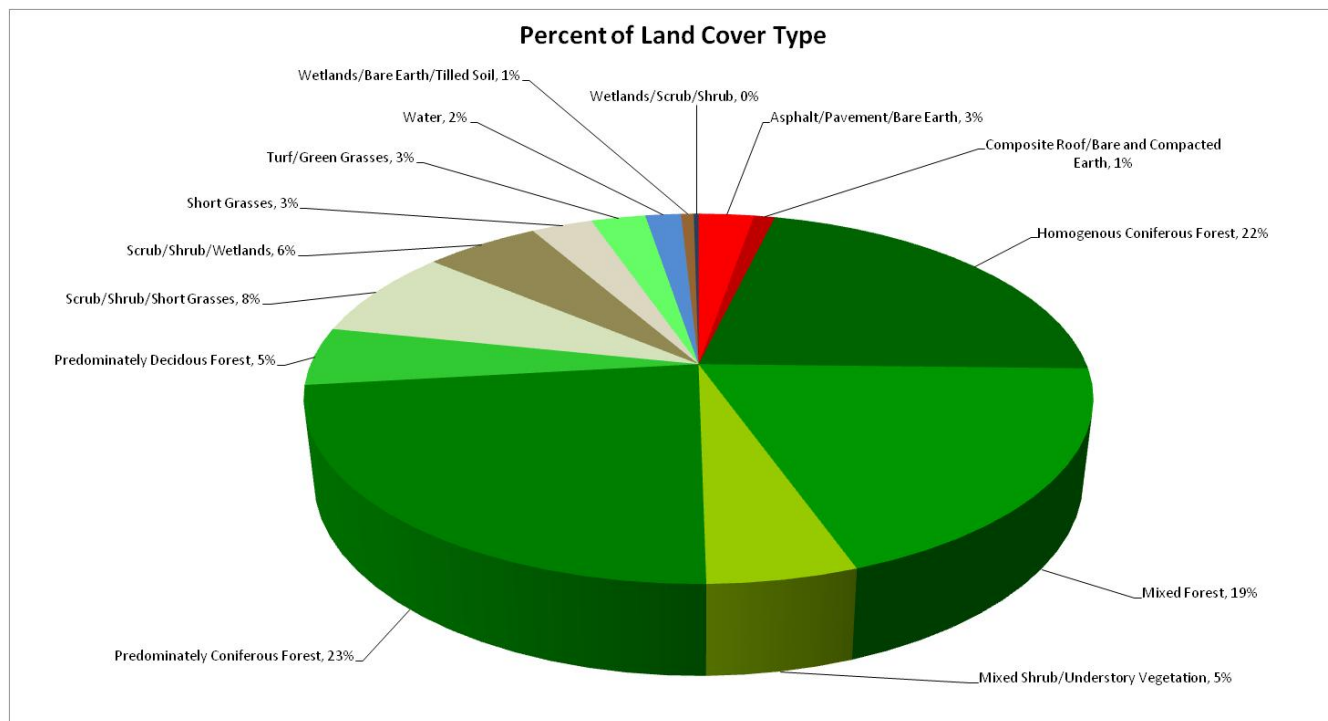


Figure 6.0 Classification Percent Totals for Lake St. Clair Study Area
Land cover data from 2009 SPOT imagery.

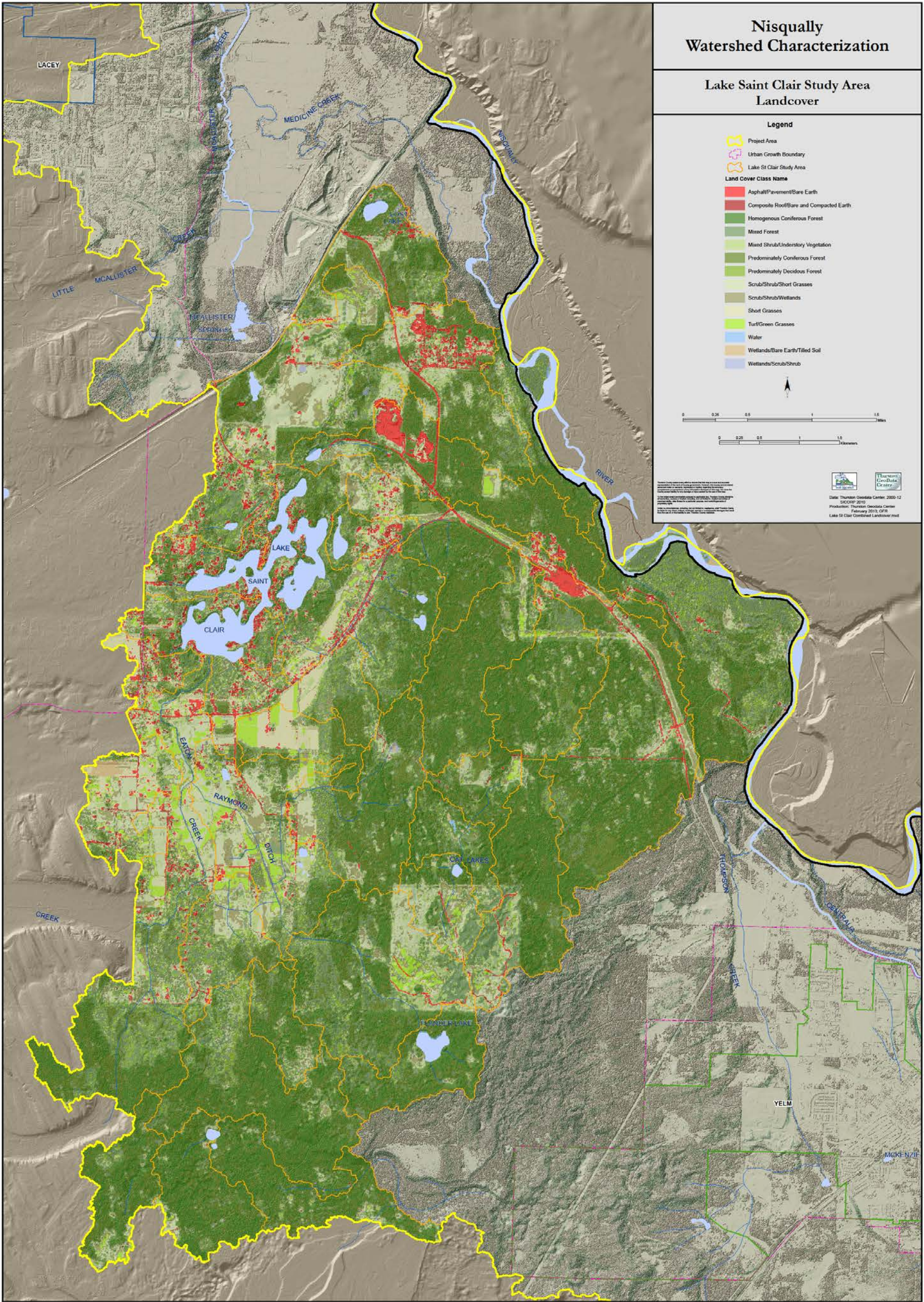


Figure 6.1 Lake St. Clair Study Area Land Cover

Part II. Characterize Condition of Ecological Processes in Study Area

Five ecological processes and habitat connectivity were assessed. The five ecological processes include the delivery and movement of water, sediment, wood, pollutants, and heat. As outlined in the Methods Document (Appendix A of this document) 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 habitat connectivity, the Rules and Assumptions (Tables 3-8 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 2 in the Methods document. For complete details of the Rules and Assumptions, please consult Tables 3 through 8 in the Methods document.

There are 34 DAUs totaling 16,579 acres (26 sq miles) in the Study Area.

Determine the Ecological Benefit of the DAU

The assessment of each individual ecological process and habitat connectivity using the indicators listed in Chapter One and the Methods MPI, and the application of the Rules and describe a baseline condition of ecological health for each DAU. All DAUs 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 within that DAU. A N/A indicates that there is no data for that DAU.

Table 6.0 describes the function level of five ecological process and habitat connectivity as PF, AR, or NPF.

Table 6.0 Lake St. Clair Ecological Processes and Biological Elements Function

DAU Id	Acres	Sq Mi	Ecological Processes					Biological Element
			Water	Wood	Sediment	Pollutants	Heat	Habitat Connectivity
60	227.17	0.35	AR	AR	AR	AR	NPF	NPF
62	651.36	1.02	AR	NPF	AR	AR	NPF	AR
49	192.02	0.30	AR	AR	AR	PF	NPF	AR
48	128.61	0.20	AR	NPF	AR	N/A	AR	AR
44	125.22	0.20	AR	AR	AR	PF	AR	NPF
78	414.21	0.65	AR	NPF	AR	AR	NPF	NPF
65	324.55	0.51	AR	NPF	PF	AR	NPF	AR
64	332.90	0.52	AR	N/A	AR	N/A	NPF	AR
46	254.41	0.40	AR	AR	AR	NPF	NPF	NPF
42	688.43	1.08	AR	NPF	AR	AR	PF	NPF
63	969.84	1.52	AR	NPF	AR	NPF	NPF	PF
57	191.03	0.30	PF	AR	AR	PF	AR	AR
52	988.51	1.54	PF	AR	PF	AR	AR	AR

DAU Id	Acres	Sq Mi	Ecological Processes					Biological Element
			Water	Wood	Sediment	Pollutants	Heat	Habitat Connectivity
40	573.03	0.90	AR	N/A	PF	N/A	AR	NPF
77	362.18	0.57	AR	N/A	PF	N/A	NPF	NPF
51	226.68	0.35	PF	AR	AR	PF	NPF	AR
56	585.04	0.91	PF	NPF	AR	AR	NPF	AR
47	328.64	0.51	AR	PF	PF	PF	NPF	NPF
45	1004.11	1.57	PF	AR	AR	NPF	AR	NPF
75	775.09	1.21	PF	AR	AR	PF	NPF	PF
61	833.34	1.30	PF	PF	AR	PF	NPF	AR
59	218.45	0.34	PF	AR	AR	PF	NPF	PF
58	564.05	0.88	PF	N/A	AR	N/A	NPF	AR
53	1064.71	1.82	PF	N/A	AR	N/A	NPF	AR
76	309.50	0.48	PF	N/A	AR	N/A	NPF	NPF
73	350.33	0.55	PF	PF	AR	PF	PF	PF
74	204.32	0.32	PF	N/A	AR	N/A	NPF	PF
50	418.75	0.65	PF	PF	AR	PF	NPF	NPF
54	492.00	0.77	PF	N/A	PF	N/A	AR	PF
55	535.49	0.84	PF	N/A	AR	N/A	NPF	PF
43	446.37	0.70	PF	PF	AR	PF	NPF	NPF
41	279.46	0.44	PF	PF	AR	PF	NPF	PF
38	1011.06	1.58	PF	PF	AR	PF	PF	NPF
37	408.47	0.64	PF	N/A	AR	N/A	NPF	NPF

An aggregation of the function level of these processes and habitat connectivity are then used to provide an overall function level and ranking of each DAU as described in the following Table 6.1.

Table 6.1 Final DAU Ecological and Biological Benefit Rank

DAU Id	Ecological Processes					Biological Element	Total Score	Weighted Rank
	Water	Wood	Sediment	Pollutants	Heat	Habitat Connectivity		
60	3	1	1	0	1	0	6	High
62	3	1	1	0	0	1	6	High
49	3	1	0	0	1	1	6	High
48	3	1	0	1	0	1	6	High
44	3	1	0	1	1	0	6	High
78	3	1	1	0	0	0	5	Moderate
65	3	0	1	0	0	1	5	Moderate
64	3	1	0	0	0	1	5	Moderate
46	3	1	0	0	1	0	5	Moderate

Ecological Processes						Biological Element	Total Score	Weighted Rank
DAU Id	Water	Wood	Sediment	Pollutants	Heat	Habitat Connectivity		
42	3	1	1	0	0	0	5	Moderate
63	3	1	0	0	0	0	4	Moderate
57	0	1	0	1	1	1	4	Moderate
52	0	0	1	1	1	1	4	Moderate
40	3	0	0	1	0	0	4	Moderate
77	3	0	0	0	0	0	3	Moderate
51	0	1	0	0	1	1	3	Moderate
56	0	1	1	0	0	1	3	Moderate
47	3	0	0	0	0	0	3	Moderate
45	0	1	0	1	1	0	3	Moderate

The weighted rank is used in the evaluation of potential restoration and enhancement sites when the DAUs and resource sites are combined to provide a prioritized list of natural resource sites.

As shown in Table 6.1 and Figure 6.2, the Lake Saint Clair Study Area has 19 DAUs that have restoration potential (weighted rank of high or moderate). DAUs ranked Low are listed in Appendix B.

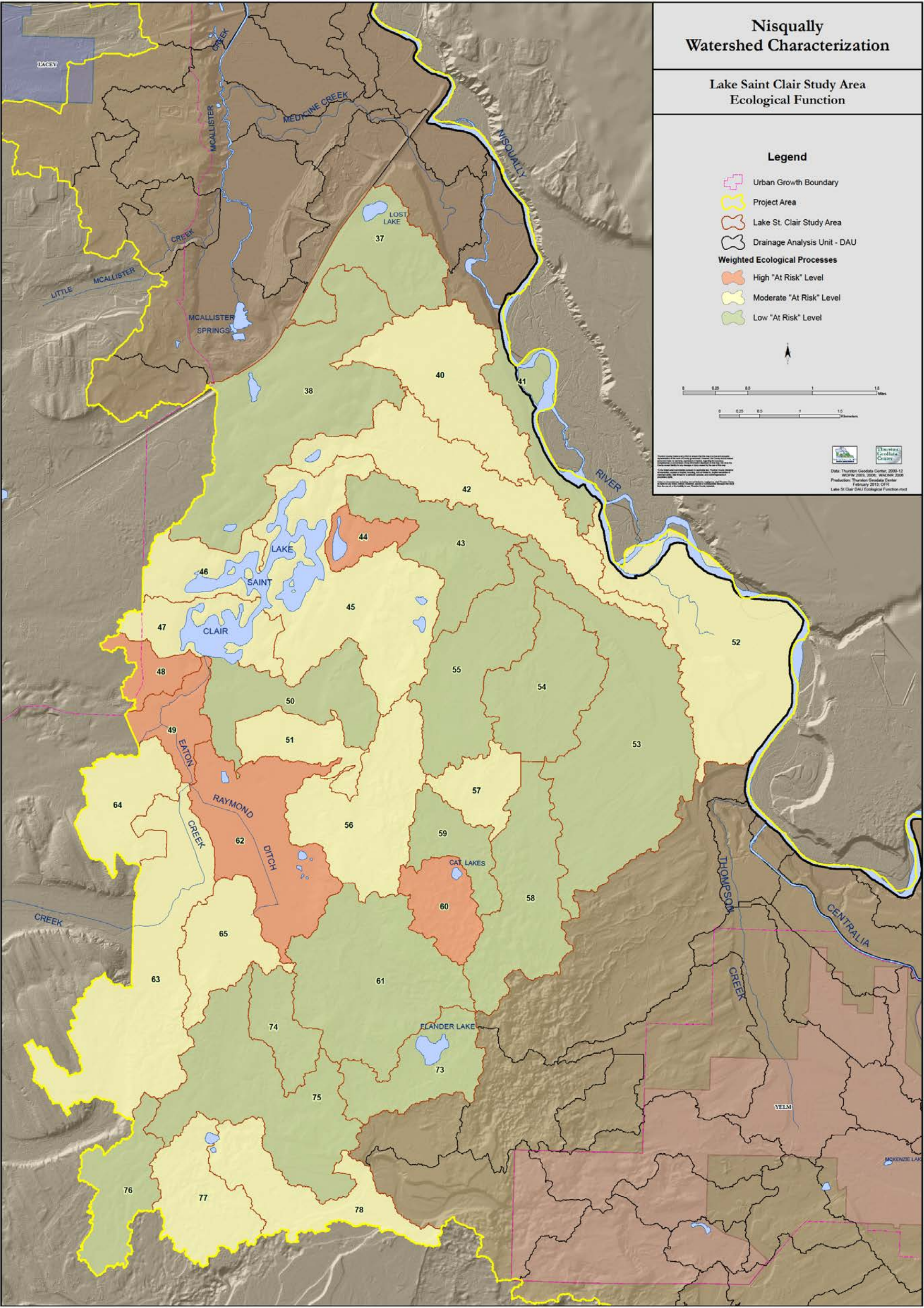


Figure 6.2 Lake St. Clair Study Area Ecological Function

Part III. Characterize Natural Resource Sites in Study Area

This section evaluates natural resource sites within the study area. The watershed characterization methods do not assess potential restoration sites at the parcel or jurisdictional boundary. The methods focus on the landscape only. The purpose is to determine natural resource sites that can be restored or enhanced in the surrounding landscape that will provide the greatest functional lift. The analysis is conducted concurrently with the analyses of the ecological processes and the one biological element, habitat connectivity. Upon completion of the DAU and natural resource site analysis, the sites identified are ranked within their corresponding DAU.

Determine the Environmental Benefit of the Resource Sites

The natural resource sites are evaluated based on the attributes during site assessment using Tables 13 to 15 in the Methods document. The sites are then assigned an environmental benefit final score.

Following the conversion of natural resource sites from a numerical score to a rank of Low, Moderate, or High rank, there were a total of 296 potential restoration or enhancement sites. Table 6.2 details the results.

Table 6.2 Lake St. Clair Environmental Benefit Ranking of Natural Resource Sites

Lake St. Clair Potential Restoration Sites				
Rank	Wetland	Riparian	Floodplain	Total
High	27	7	0	34
Medium	39	11	1	51
Low	194	15	2	211

Part IV. Assess Potential Sites within the DAU

This section presents the results of a ranking process for all potential natural resource restoration sites within the DAU. This ranking of a natural resource restoration site is based on a combination of each site's individual site rank combined with the ranking of the DAU within which the restoration site is located. The result of this combination is a final score from 0 to 6, with a score of 6 representing those sites with the greatest potential for environmental benefit if restored. See Chapter 1 Part III and the Methods document for a description of the methodology used.

Following evaluation, a total of 296 sites in the Lake Saint Clair Study Area were ranked within their corresponding DAU. Of those 296 sites, there were 85 sites that had high or moderate restoration value.

A site with a Low environmental benefit is a preservation site or completely degraded site that would provide a minimal environmental benefit if restored.

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

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

Wetland Sites

Table 6.3 presents the results of wetland site ranking. The wetland rank is the result of the combined wetland restoration potential and the DAU ranking. There are 85 sites that ranked high or moderate.

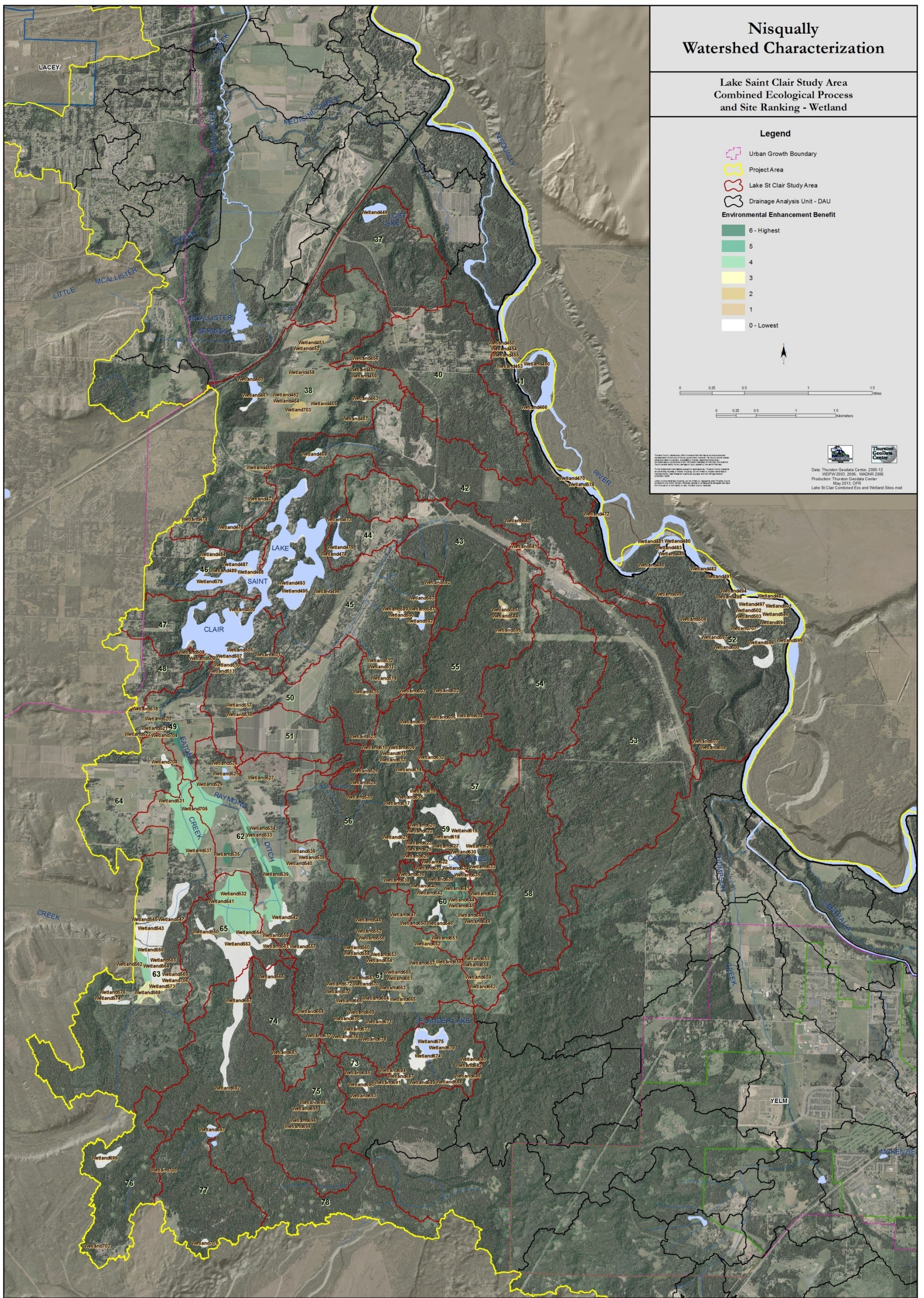
Wetland sites ranked Low or less than one acre are not included in Table 6.3. However, they have been ranked and are listed in Appendix C. Figure 6.3 shows the location of each wetland restoration site.

Table 6.3 Wetland Sites

Site ID	Wetlands Rank	Combined DAU and Site Score	Acres
Wetland533	High	6	1.91
Wetland535	High	6	5.33
Wetland536	High	6	2.11
Wetland539	High	6	7.48
Wetland651	High	6	1.25
Wetland704	High	6	6.91
Wetland532	High	4	116.47
Wetland562	High	4	10.18
Wetland705	High	4	115.99
Wetland452	High	2	1.15
Wetland652	High	2	2.25
Wetland665	High	2	1.40
Wetland703	High	2	7.33
Wetland509	Moderate	5	1.25
Wetland525	Moderate	5	2.99
Wetland641	Moderate	5	1.25
Wetland644	Moderate	5	2.07
Wetland468	Moderate	3	3.78
Wetland491	Moderate	3	1.35
Wetland568	Moderate	3	13.17
Wetland573	Moderate	3	2.50
Wetland586	Moderate	3	7.38
Wetland594	Moderate	3	1.54
Wetland706	Moderate	3	1.38
Wetland450	Moderate	1	7.50

Site ID	Wetlands Rank	Combined DAU and Site Score	Acres
Wetland451	Moderate	1	9.96
Wetland453	Moderate	1	1.90
Wetland466	Moderate	1	0.39
Wetland469	Moderate	1	0.34
Wetland578	Moderate	1	25.36
Wetland584	Moderate	1	4.22
Wetland659	Moderate	1	2.45

The following figures appear cluttered when printed at a scale less than 33 x 44 inches (the format it was developed for). The maps are best viewed electronically where the viewing area is easily enlarged.



Riparian condition

Table 6.4 presents the results of riparian restoration site ranking taking into account the combined riparian restoration potential and the DAU ranking. There are 19 riparian sites that ranked high or moderate. The resulting combined score of the natural resource sites within the context of the DAU are shown in Figure 6.4.

Riparian sites ranked Low are not included in Table 6.4. However, they have been ranked and are listed in Appendix C.

Table 6.4 Riparian Sites

Site ID	Riparian Rank	Combined DAU and Site Score	Acres
Riparian13	High	6	81.38
Riparian151	High	4	20.27
Riparian157	High	6	41.74
Riparian158	High	4	75.19
Riparian163	High	4	59.90
Riparian164	High	6	51.00
Riparian169	High	4	83.77
Riparian14	Moderate	3	35.46
Riparian48	Moderate	1	10.46
Riparian49	Moderate	3	88.99
Riparian52	Moderate	3	13.86
Riparian55	Moderate	1	85.17
Riparian150	Moderate	3	24.26
Riparian156	Moderate	3	70.24
Riparian159	Moderate	3	19.81
Riparian167	Moderate	1	120.34
Riparian168	Moderate	3	99.23
Riparian294	Moderate	3	3.89

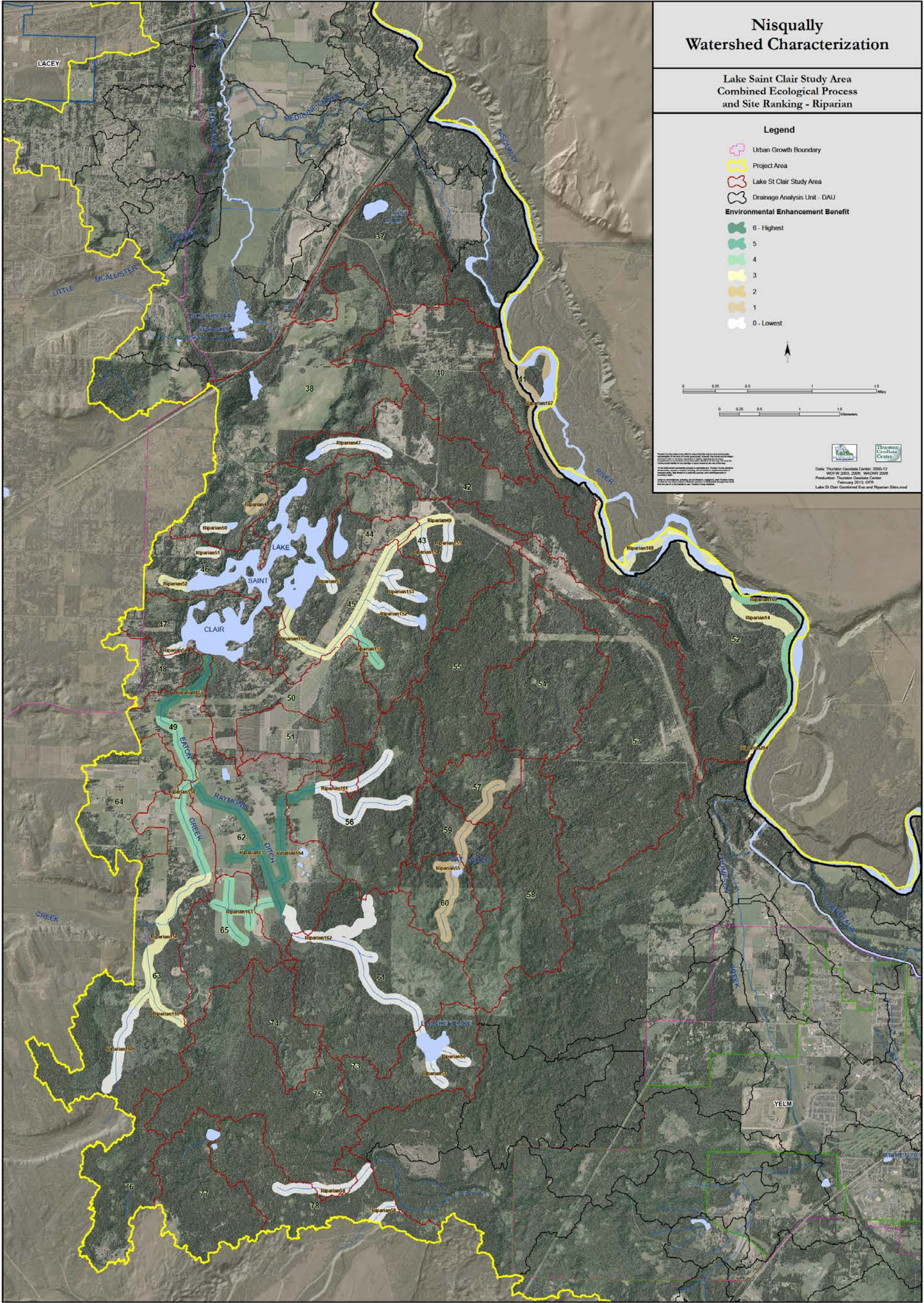


Figure 6.4 Lake St. Clair Study Area Ecological Processes and Site Ranking – Riparian

Floodplain Condition

There was only one floodplain site and it was ranked Moderate

Figure 6.5 illustrates the resulting combined score of the Floodplain natural resource sites within the context of the DAU.

Table 6.5 **Floodplain Sites**

Site ID	Floodplain Rank	Combined DAU and Site Score	Acres
Floodplain9	Moderate	5	107.30

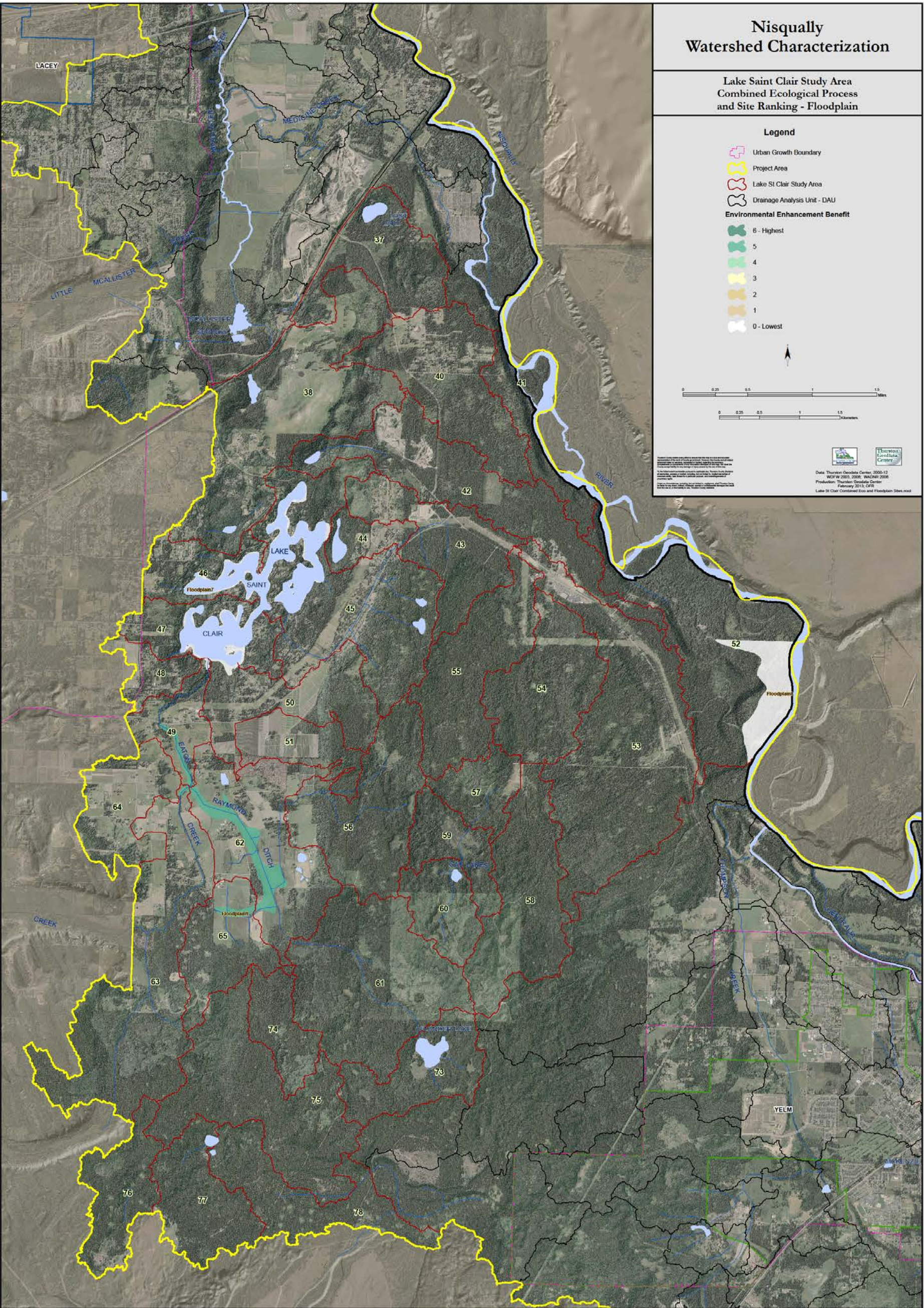


Figure 6.5 Lake St. Clair Study area Ecological Processes and Site Ranking - Floodplain