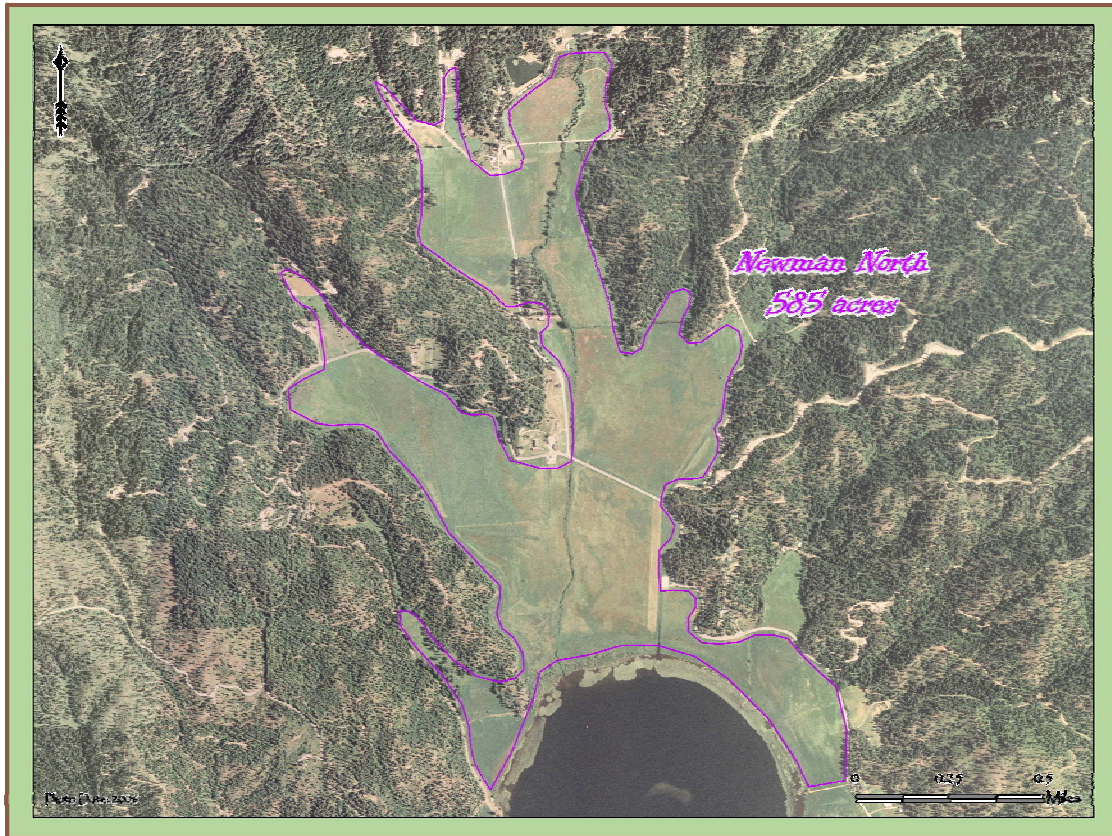


---

# POTENTIAL WETLAND PROJECT SITES WRIAS 55 AND 57

---

*Spokane, Stevens and Pend Oreille Counties, Washington*



Prepared for:

**SPOKANE COUNTY DIVISION OF UTILITIES**  
**PUBLIC WORKS BUILDING**  
1026 W. Broadway Ave.  
Spokane, WA 99260

Prepared by:



1120 Cedar Street  
Missoula, MT 59802

April 2009



15320 East Marietta Ave. Suite 9A  
Spokane Valley, WA 99216

Project No. 100004720

**CONTENTS**

	<u>Page</u>
1.0 INTRODUCTION.....	1
2.0 METHODS .....	1
3.0 RESULTS .....	5
3.1 Overview of Results .....	5
3.2 Individual Potential Wetland Project Site Information .....	7
3.3 Potential Wetland Project Site Ranking and Future Evaluation.....	15
4.0 SUMMARY .....	16
5.0 REFERENCES.....	17

**APPENDICES**

- Appendix A. Digital Map of NWI Current Wetlands
- Appendix B. Digital Map of USDA Wet and Drained Soils
- Appendix C. Digital Map of Potential Wetland Project Sites in WRIA 55 and 57
- Appendix D. Digital Air Photos of Individual Potential Wetland Project Sites
- Appendix E. Digital Ground Photos of Potential Wetland Project Sites
- Appendix F. Digital Version of the Report
- Appendix G. Shapefile Version of Potential Wetland Project Sites in WRIA 55 and 57

**TABLES**

Table 3-1. WRIA 55 and 57 Summary Data.....	7
Table 3-2. Potential Wetland Project Site Information and Ranking <sup>1</sup> .....	8
Table 3-3. Potential Wetland Sites and Alternates for Detailed Evaluation .....	15

**FIGURES**

Figure 1-1. WRIA 55 and 57 Project Area .....	2
Figure 2-1. National Wetland Inventory (NWI) Wetlands .....	3
Figure 2-2. USDA Soil Survey Drained and Wet Soils .....	4
Figure 3-1. Potential Wetland Project Sites .....	6

## 1.0 INTRODUCTION

This report identifies potential wetland restoration and creation project sites in Water Resource Inventory Areas (WRIA) 55 and 57 located within Spokane, Stevens and Pend Oreille Counties in eastern Washington State (**Figure 1-1**). The primary purpose of this project was to identify areas of former wetland that have been drained or otherwise converted to non-wetland and that may be candidates for wetland restoration projects. Additional areas were identified that may not have been wetland in the past but which appear to exhibit reasonable potential for conversion to wetland.

All sites were ranked for their potential as wetland restoration or creation projects using available information on size, water availability, water storage, aquifer recharge, and other criteria, as well as success potential. Additional information was collected for each site including current wetland status, ownership, current land use and soils. A total of 130 potential wetland restoration or creation sites were identified covering approximately 6,000 acres.

## 2.0 METHODS

The original method proposed for this project was to compile and develop both current and historic wetland distribution maps of WRIs 55 and 57 and then conduct a comparison for purposes of identifying drained or otherwise converted historic wetlands representing potential wetland restoration project sites. This original approach was modified based on a lack of sufficient detail and quality in the available data.

The first information source evaluated for developing a current wetland distribution map was the National Wetland Inventory (NWI) (**Figure 2-1**). This inventory illustrates wetlands identified by NWI staff based on remote sensing methods, primarily aerial photograph interpretation, with little or no ground verification. The second information sources evaluated for current wetland distribution were the USDA soil surveys of Spokane, Stevens and Pend Oreille counties (**Figure 2-2**). These soil surveys are based on a combination of aerial photograph interpretation and significant ground verification.

We first performed an office review comparing the NWI maps with the soil maps and found significant discrepancies, which included individual wetlands being identified on NWI mapping but not USDA mapping, or visa versa. For instance, the NWI maps showed approximately 26,000 acres of wetlands in WRIs 55 and 57, but the soil maps only identified approximately 5,000 acres of wet soils. We also compared the NWI and USDA maps with current aerial photography and conducted spot checks on the ground to determine the accuracy of both NWI and soil maps. Our ground reviews also revealed significant discrepancies. These included areas identified on the NWI or soil maps as wetland which are not currently wetland, and areas of wetland that were not indicated on the maps. These discrepancies are likely due to several factors, including the lack of comprehensive ground verification in conjunction with these mapping efforts and that a significant amount of time has passed since these maps were produced, allowing for wetland loss or establishment.

The first information sources evaluated for developing a historic wetland map were the soil surveys from Spokane, Stevens and Pend Oreille counties (**Figure 2-2**). These maps include “drained soils” which are usually former wetland areas that have been drained for crop production. Office review of these maps included comparison with current aerial photography. This office review revealed that most areas identified as drained soils exhibited evidence of drainage on the current aerial photographs. Our field spot checks also revealed that areas identified as drained soils on the maps appeared to be former wetlands. The second information source we evaluated for developing a historic wetland map was historic aerial photography. This option was ultimately dismissed due to the cost of obtaining photographs, the poor resolution of the available photography, and the fact that a significant amount of wetland loss occurred prior to the earliest available aerial photography.

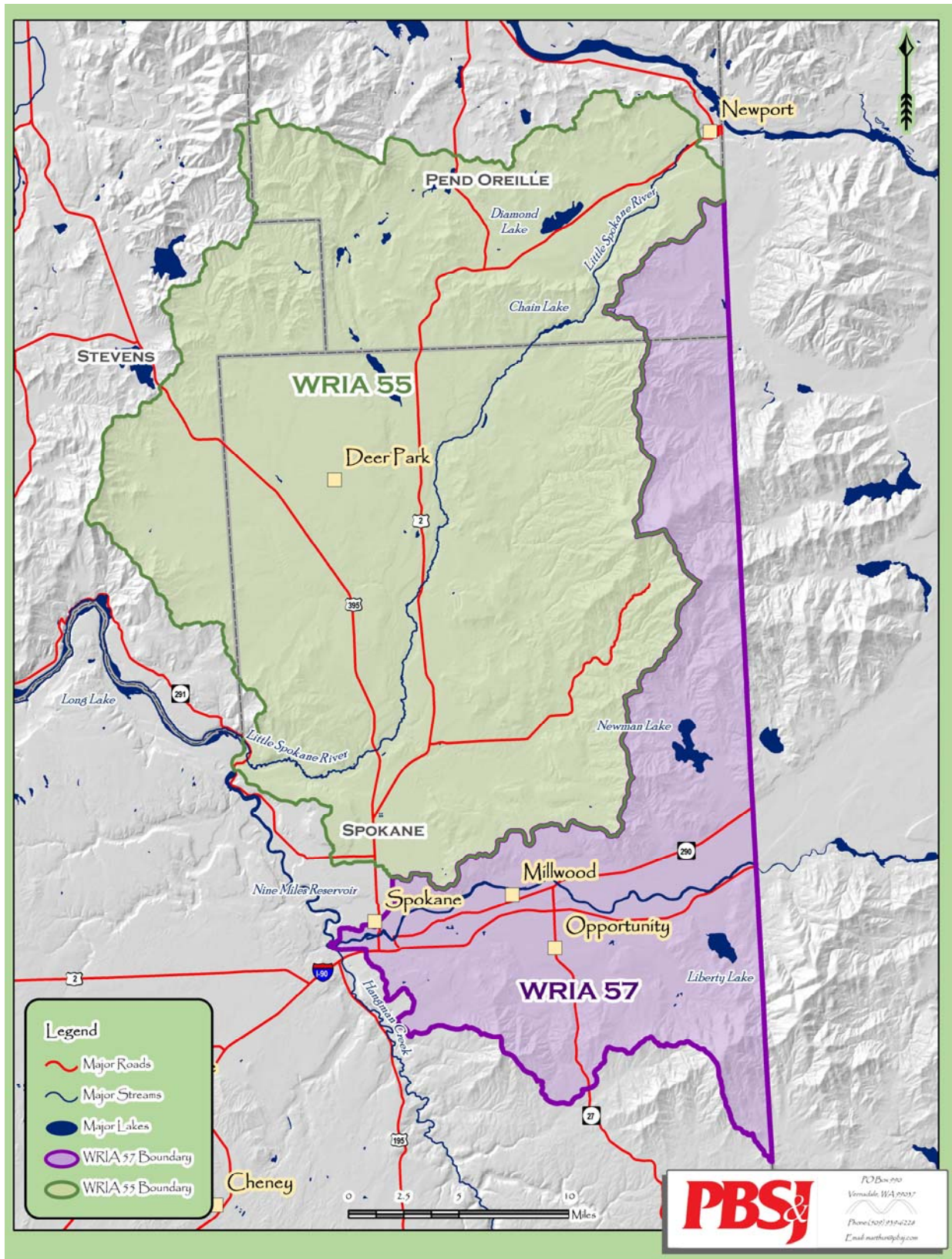
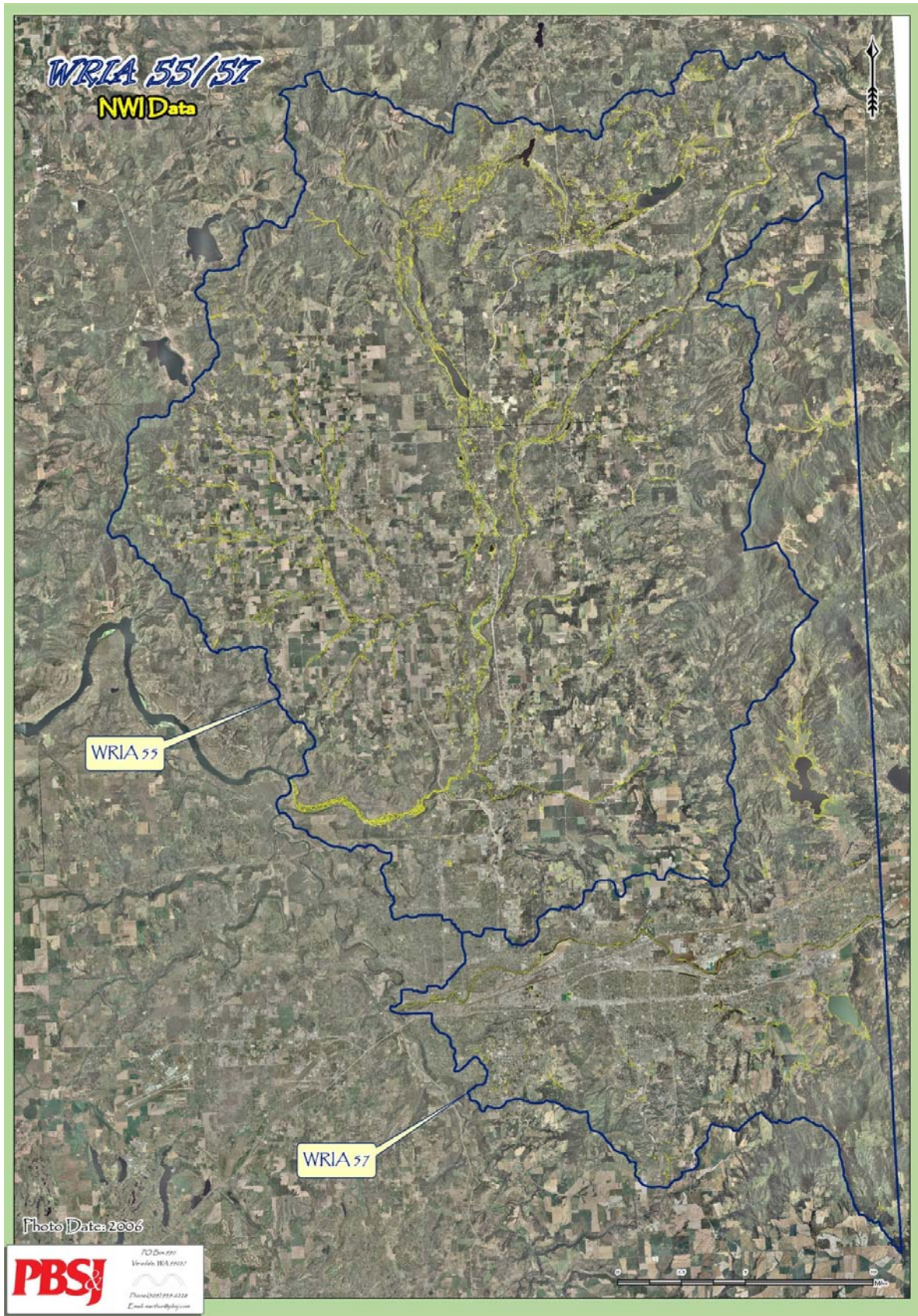
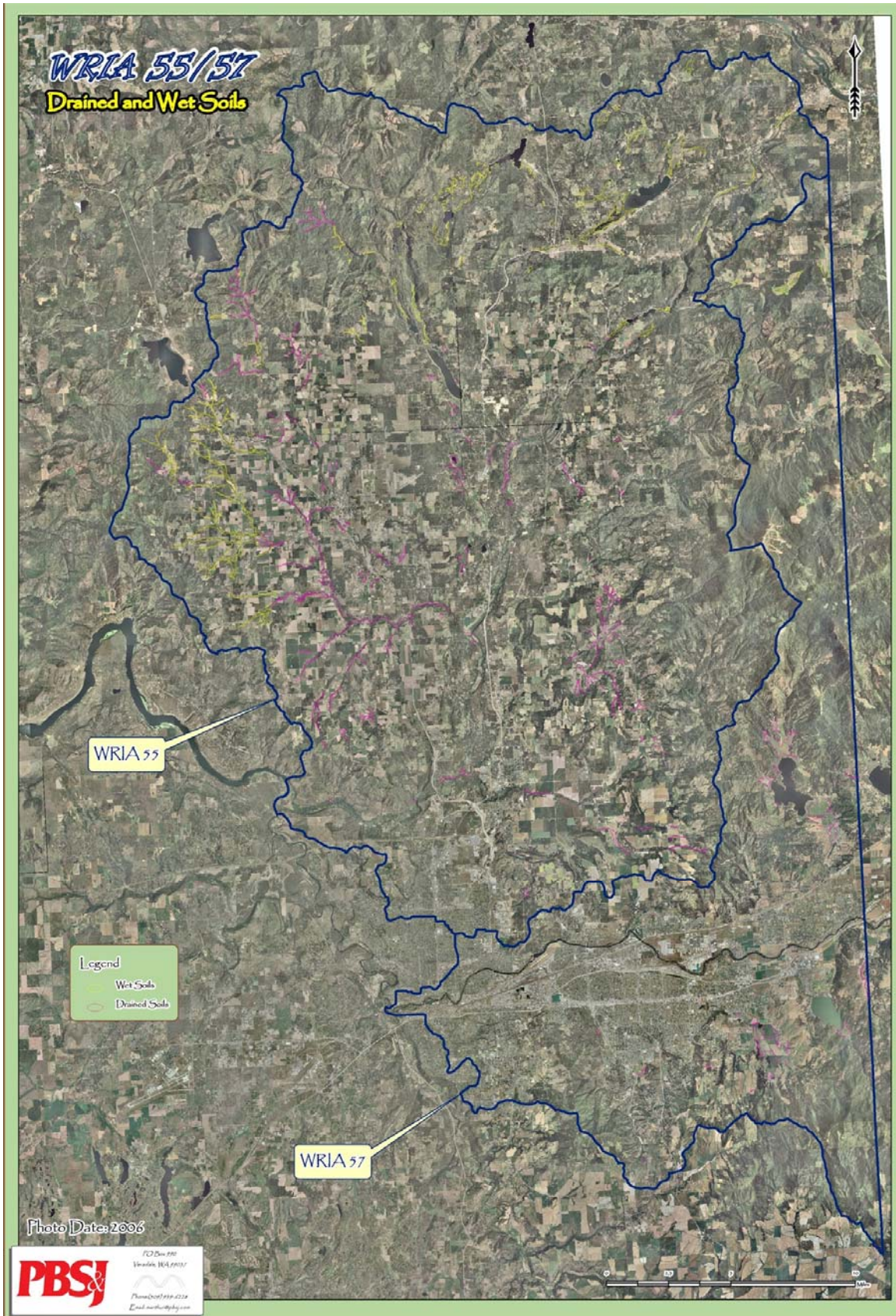


Figure 1-1. WRIA 55 and 57 Project Area



**Figure 2-1. National Wetland Inventory (NWI) Wetlands**  
(A more detailed digital version of this map is available in Appendix A)



**Figure 2-2. USDA Soil Survey Drained and Wet Soils**  
(A more detailed digital version of this map is available in Appendix B)

Since the available NWI wetland and USDA wet soil mapping information was of limited utility in identifying potential wetland restoration project sites, current high-resolution aerial photography was examined. Aerial photographs of the entire WRIA 55/57 area were evaluated by staff familiar with wetland identification, wetland soil identification, drainage system identification, and stream alteration identification. NWI and soil maps were used as initial indicators of potential current and historic wetlands, but were then confirmed with current aerial photography and limited field verification. Our field verification confirmed that this method appeared accurate for identifying potential wetland restoration (and creation) project sites. We recognize that, due to the dependence on aerial photograph interpretation, not all sites may prove to be feasible for a variety of reasons. Other sites may also be identified in the future that do not appear in this study by applying additional information and more intensive field verification. Also note that the boundaries indicated for potential wetland project sites are approximate and may change based on more accurate investigation on-the-ground.

## 3.0 RESULTS

### 3.1 Overview of Results

#### Wetland Acreages

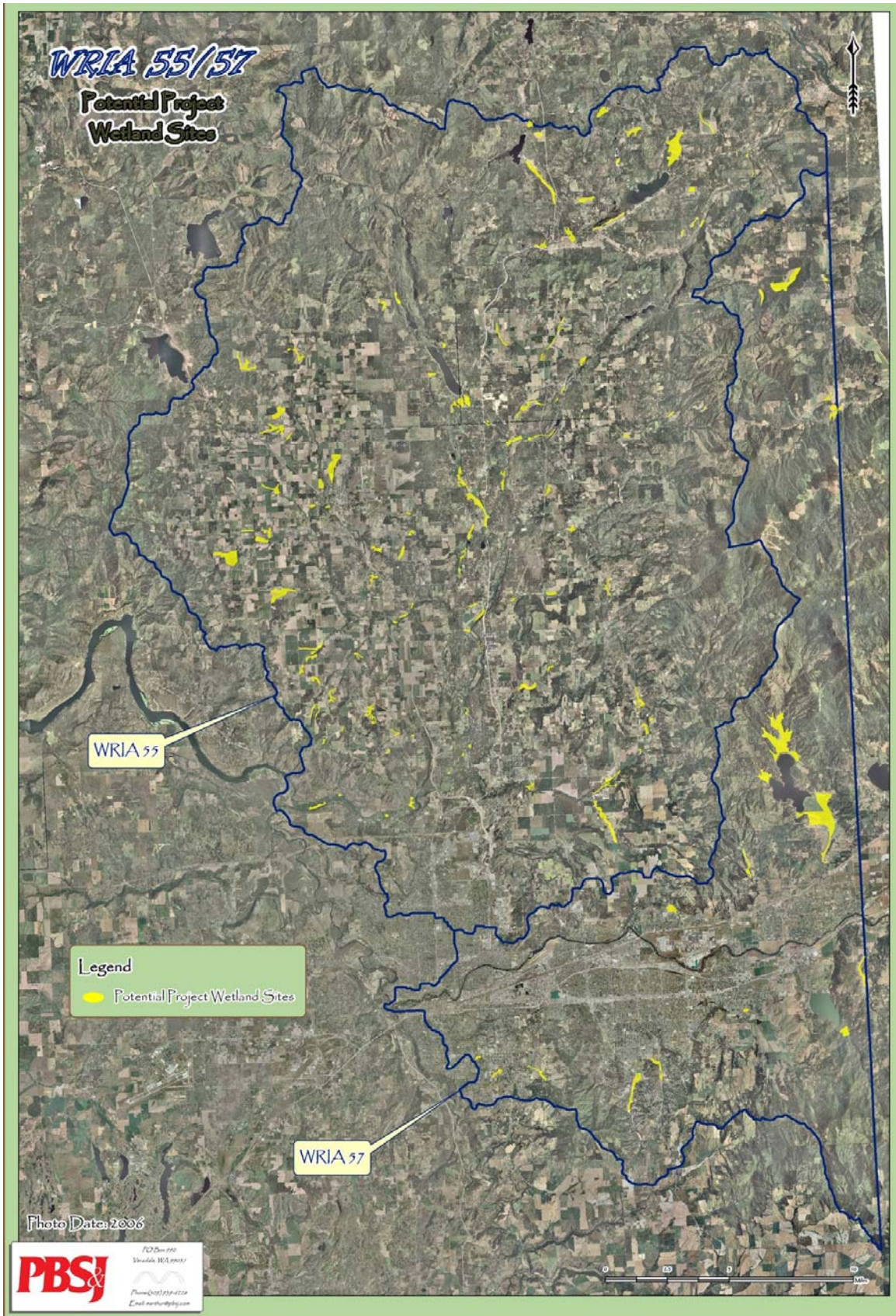
**Figure 3-1** illustrates the locations of potential wetland restoration and creation project sites in WRIsAs 55 and 57. A digital version of this map is included as **Appendix C** for more detailed viewing and individual site identification. A shapefile version of this map is included as **Appendix G** for use in GIS or CADD applications. **Table 3-1** summarizes overall results from this effort. The total acreage of the two WRIsAs is 616,605 acres. The area of wetlands identified on the NWI maps is 20,035 acres. This compares with only 4,813 acres of wet soils identified by the USDA soil survey of the same area. The area of NWI wetlands should correspond more closely with USDA wet soils and we are not able to explain why this discrepancy occurs. Even considering that both inventories include aerial photograph interpretation, we would still expect closer correlation between the two. Some areas identified as wetland on the NWI maps were not identified as wet soils on the soils maps. Some areas identified as wet soils on the soils maps were not identified as wetlands on the NWI maps. To estimate the total area of current wetlands, we added the total acreage of wetlands reported on the NWI maps to the total acreage of wet soils reported on the USDA soil maps. Where these two maps overlapped (both NWI wetlands and wet soils indicated at the same location) we did not count these acres twice but only counted the overlapping areas once. This evaluation resulted in a total acreage of 22,240, which we have used as the best estimate of current wetland acreage in WRIsAs 55 and 57.

#### Wetland Loss

The *Drained Soils* total of 6,127 acres was used as the best estimate of wetland loss in WRIsAs 55 and 57 (**Table 3-1**). By comparing the 26,094 acres of current wetlands with the 6,127 acres of drained soils, we estimated a 24% net loss of historic wetlands in WRIsAs 55 and 57. Estimated percent wetland loss in WRIA 55 is 21% and in WRIA 57 is 30%.

#### Potential Wetland Project Sites

A total of 130 potential wetland restoration and creation project sites were identified totaling 6,029 acres (**Table 3-1**). It is significant to note that the acreage identified in this independent evaluation matches closely the estimate of wetland loss in both WRIsAs. These potential wetland project sites are well-distributed across the area of WRIsAs 55 and 57, mainly along streams and lakes. It is likely that not all sites and not all portions of all sites will actually prove feasible for wetland projects. In some cases, there may also be additional area outside of delineated potential sites that will prove feasible for inclusion in a wetland restoration or creation project.



**Figure 3-1. Potential Wetland Project Sites**  
(A more detailed digital version of this map is available in Appendix C)



**Table 3-1. WRIA 55 and 57 Summary Data**

	WRIA 55	WRIA 57	WRIA 55+57
<b>TOTAL ACRES</b>	433,165	183,440	616,605
<b>NWI-MAPPED WETLANDS</b>	13,818	6,217	20,035
<b>USDA-DELINEATED WET SOILS</b>	4,580	233	4,813
<b>NWI WETLANDS + USDA WET SOILS (without overlap)</b>	15,904	6,336	22,240
<b>USDA-MAPPED DRAINED SOILS</b>	3,964	2,163	6,127
<b>ESTIMATED % WETLAND LOSS</b>	21%	30%	24%
<b>NUMBER OF POTENTIAL WETLAND RESTORATION / CREATION PROJECT SITES</b>	115	19	130
<b>ACREAGE OF POTENTIAL WETLAND RESTORATION / CREATION PROJECT SITES</b>	3,893	2,136	6,029

**Appendix D** contains digital aerial photographs of each individual potential wetland project site. **Appendix E** contains ground photographs of example wetland project sites visited while conducting fieldwork.

### 3.2 Individual Potential Wetland Project Site Information

This section briefly describes information collected for each potential wetland project site and its use in evaluating and ranking. **Table 3-2** lists information for the 130 potential wetland project sites such as size, hydrologic conditions, ownership and potential for success. Ranking is discussed further in the following section. A digital version of this report including **Table 3-2** is included as **Appendix F**. **Table 3-2** can be copied from this report into a spreadsheet or other document to allow for independent sorting and calculation. Users may wish to sort potential wetland sites by WRIA, or rank them by acreage or other factors.

#### Name

Site names were chosen based on local names in the vicinity so that those familiar with the area can more easily locate individual sites. For instance, Site 17 - Chattaroy 1 is near the town of Chattaroy.

#### Acres

Acreage for each site was determined using standard GIS techniques and was rounded to the nearest acre. Larger sites have the potential to provide more water storage and other benefits and were ranked higher. All sites less than ten acres were ranked low. Remember that acreages are approximate and may vary due to air photo distortion, photo registration and on-the-ground investigations.

#### WRIA

The Water Resource Inventory Area (WRIA) in which each site is located – either 55 or 57.

#### Area

This designation was included for those not familiar with local geographic names and indicates the quadrant of the WRIA 55/57 area in which each site is located. Using **Figure 4** as an example, Chattaroy is the approximate center of the map and sites northeast of Chattaroy are designated as NE (northeast quadrant).

**Table 3-2. Potential Wetland Project Site Information and Ranking**  
(see report Section 3.2 for code descriptions)

Site	Name	Acres	WRIA	Area	NWI %	Wet Soil %	Drained Soil %	CARA	FEMA Q3	Owners	Ownership	Drainage	Stream Alteration	Site Type	Water Dependability	Success Potential	Ranking
1	Austin	9	55	SW	15	0	0	L	N	1		N	N	I	L	L	L
2	Ballard 1	13	55	SW	0	0	0	M	Y	1		N	Y	S	M-L	M-L	L
3	Ballard 2	4	55	SW	0	0	0	C	Y	2		N	Y	S	M-L	M-L	L
4	Ballard 3	5	55	SW	0	0	71	L	N	3		Y	N	I	M-L	M-L	L
5	Ballard 4	6	55	SW	0	0	34	L	N	3		N	N	I	L	L	L
6	Bear 1	132	55	NW	63	0	0	M	Y	9		Y	Y	S	M	M	M
7	Bear 2	61	55	NW	68	0	70	M	Y	11		N	Y	S	M	M	M
8	Beaver	53	55	NW	8	0	39	M, N	Y	4		N	Y	S	L-M	L-M	L-M
9	Bernhill 1	64	55	SW	0	0	43	L, M	N	12		Y	Y	S	L-M	L-M	L-M
10	Bernhill 2	35	55	SW	26	0	35	L	N	16		N	Y	S	M	M	M
11	Bernhill 3	29	55	SW	0	0	70	L	N	7	N	N	Y	S	L-M	L-M	L-M
12	Blanchard	13	55	NE	70	0	0	M,C	N	3		Y	Y	S	L-M	L-M	L-M
13	Blanchard North	18	57	NE	80	0	0	L, M	N	2		Y	N	I	L-M	L-M	L-M
14	Blanchard South	68	57	NE	44	0	0	M, N	Y	3		N	Y	S	L-M	L-M	L-M
15	Buckeye	9	55	SW	82	0	0	C	Y	2	N	N	Y	S	M	M	L
16	Camden	28	55	NE	82	0	0	L, M	Y	2		Y	Y	S	M	M	L-M
17	Chattaroy 1	35	55	NW	83	0	0	C	Y	3		N	Y	S	M	M	M
18	Chattaroy 2	12	55	NW	2	0	0	C	N	4		N	N	I	L	L	L
19	Chattaroy 3	14	55	NW	22	0	79	C	Y	2		N	N	S	L-M	L	L
20	Chattaroy 4	4	55	NW	100	0	0	C	Y	6		N	Y	S	M	M	L
21	Chattaroy 5	10	55	NW	0	0	0	C	Y	1		N	Y	S	L-M	L-M	L
22	Chattaroy 6	28	55	NW	0	0	0	M	N	2		N	Y	S	L-M	L-M	L
23	Chester Creek	107	57	SE	5	0	0	C	Y	25		N	Y	S	L-M	L-M	M
24	Clayton 1	83	55	NW	32	0	58	M	N	10		Y	N	I	M	M	M
25	Clayton 2	88	55	NW	1	0	13	M, N	N	5		Y	Y	S	M	M	M
26	Clayton 3	13	55	NW	1	0	42	M	N	5		N	Y	S	L-M	L-M	L-M
27	Colbert 1	8	55	SW	28	0	0	C	Y	4		N	Y	S	M	M	L

**Table 3-2. Potential Wetland Project Site Information and Ranking, continued**  
(see report Section 3.2 for code descriptions)

Site	Name	Acres	WRIA	Area	NWI %	Wet Soil %	Drained Soil %	CARA	FEMA Q3	Owners	Ownership	Drainage	Stream Alteration	Site Type	Water Dependability	Success Potential	Ranking
28	Colbert 2	5	55	SW	0	0	0	C	Y	1		N	Y	S	M	M	L
29	Colbert 3	3	55	SW	51	0	90	C	Y	2		N	Y	S	M	M	L
30	County Line E	31	55	NE	22	0	0	M,N	N	2		N	Y	S	L-M	L-M	L-M
31	Crestline	15	57	SW	36	0	0	C	Y	6		N	N	I	L	L	L
32	Dartford 1	31	55	SW	78	0	15	C,L	Y	3	F	Y	Y	S	M	M	M
33	Dartford 2	9	55	SW	46	0	0	C	Y	3		N	Y	S	M	M	L
34	Deadman 1	26	55	SW	3	0	24	L	Y	4		Y	Y	S	L-M	L-M	L-M
35	Deadman 2	30	55	SE	43	0	0	L	Y	9		Y	Y	S	M	M	M
36	Deadman 3	31	55	SE	11	0	0	L	Y	8		N	Y	S	L-M	L-M	L-M
37	Deer	160	55	NW	2	0	55	C	N	14		Y	Y	S	L-M	L-M	L-M
38	Deer West 1	39	55	NW	0	0	27	M	N	2		Y	Y	S	L	L	L
39	Deer West 2	13	55	NW	4	0	7	M	N	1		N	Y	S	L-M	L-M	L
40	Deer West 3	7	55	NW	27	0	29	M,C,L	N	1		Y	N	I	L-M	L-M	L
41	Dennison 1	29	55	NW	38	0	41	M,L	N	5		Y	N	I	L	L	L
42	Dennison 2	31	55	NW	6	0	25	M,L	N	2		N	N	I	L	L	L
43	Dennison 3	15	55	NW	52	0	0	M,L	N	2		N	N	I	L	L	L
44	Dennison 4	7	55	NW	49	0	0	M,L	N	5		N	N	I	L	L	L
45	Dennison 5	35	55	NW	0	0	47	M,L	N	4		N	N	I	L	L	L
46	Diamond N	295	55	NE	86	97	NA	N	NA	NA		Y	Y	S	M-H	M-H	VH
47	Diamond NE	31	55	NE	97	0	NA	N	NA	NA		N	Y	S	L	L	L
48	Diamond SW	39	55	NE	40	36	NA	N	NA	NA		N	N	L	H	H	H
49	Diamond W	50	55	NE	79	60	NA	N	NA	NA		Y	Y	S	M-H	M-H	M-H
50	Dragoon 1	8	55	NW	7	0	30	M,C	Y	2		N	Y	S	L-M	L-M	L
51	Dragoon 2	16	55	NW	11	0	100	M	Y	6		Y	Y	S	M	M-H	M
52	Dragoon 3	8	55	NW	65	0	99	M	Y	3	N	N	Y	S	M	M	L
53	Dunn	24	55	NE	0	0	0	L,M	N	5		N	N	I	L-M	L-M	L
54	Elk 1	10	55	NE	26	0	0	L	Y	2		N	Y	S	M	M	L

**Table 3-2. Potential Wetland Project Site Information and Ranking. continued**  
(see report Section 3.2 for code descriptions)

Site	Name	Acres	WRIA	Area	NWI %	Wet Soil %	Drained Soil %	CARA	FEMA Q3	Owners	Ownership	Drainage	Stream Alteration	Site Type	Water Dependability	Success Potential	Ranking
55	Elk 2	4	55	NE	3	0	0	L	Y	3		N	Y	S	L-M	L-M	L
56	Elmer	32	57	NE	82	0	NA	N	NA	NA		Y	Y	S	L-M	L-M	L-M
57	Eloika NE	13	55	NW	0	0	93	M	N	3		Y	N	I	L-M	L-M	L-M
58	Eloika S	39	55	NW	97	0	0	L,M	Y	4		Y	Y	L	H	H	VH
59	Eloika SE	49	55	NW	52	0	0	L,M	Y	2		Y	Y	L	H	H	VH
60	Eloika SW	24	55	NW	80	0	34	M	Y	3		Y	Y	L	H	H	VH
61	Eloika W	21	55	NW	6	0	76	L,M	N	3		Y	N	I	L	L	L
62	Eloika Road N	3	55	NW	51	0	0	L,M	N	2		N	N	I	L-M	L-M	L
63	Eloika Road S	6	55	NW	62	0	0	L	Y	4		N	Y	S	M	M	L
64	Fan Lake N	27	55	NW	1	0	NA	N	NA	NA	F	Y	Y	S	L-M	L-M	L-M
65	Fan Lake NW	33	55	NW	11	0	NA	N	NA	NA	F	N	N	I	L	L	L
66	Frog 1	195	55	NW	21	37	0	N	NA	NA		Y	Y	S	L-M	L-M	L-M
67	Frog 2	16	55	NW	50	59	0	N	NA	NA		N	N	I	L	L	L
68	Frog 3	53	55	NW	4	37	58	N	NA	NA		Y	N	I	L	L	L
69	Frog 4	36	55	NW	0	1	87	N	NA	NA		Y	N	I	L	L	L
70	Glenrose	34	57	SW	22	0	0	C	N	7		Y	Y	S	L-M	L-M	L-M
71	Highway 27 S.	50	57	SE	3	0	0	C	Y	8		Y	N	SW	L	L	L
72	Highway 211 E	63	55	NE	91	79	NA	N	NA	NA		Y	Y	S	M	M	M
73	Highway 211 S	32	55	NE	85	83	NA	N	NA	NA		Y	N	I	L-M	L-M	L-M
74	Liberty Lake	120	57	SE	88	0	48	L	Y	1	S	Y	N	L	H	H	H
75	Lillija	7	55	NE	0	NA	0	N	NA	NA		Y	Y	S	L-M	L-M	L
76	Little Spokane	58	55	NE	88	0	59	L,M	Y	17		Y	Y	S	M	M	M
77	Loon	84	55	NW	13	0	31	N	NA	NA		Y	Y	S	L-M	L-M	L-M
78	Madison	52	55	SE	0	0	42	L	N	8		Y	Y	S	L-M	L-M	L-M
79	Mallard	14	55	NE	26	78	NA	N	NA	NA		Y	N	L	M-H	M-H	M
80	Milan 1	14	55	NE	78	0	12	L,M,C	Y	1		Y	S	S	L-M	L-M	L-M
81	Milan 2	21	55	NE	72	0	45	M,C	Y	5		Y	Y	S	M	M	M

**Table 3-2. Potential Wetland Project Site Information and Ranking, continued**  
(see report Section 3.2 for code descriptions)

Site	Name	Acres	WRIA	Area	NWI %	Wet Soil %	Drained Soil %	CARA	FEMA Q3	Owners	Ownership	Drainage	Stream Alteration	Site Type	Water Dependability	Success Potential	Ranking
82	Milan 3	24	55	NE	85	0	0	L	N	2	N	Y	N	I	L-M	L-M	L-M
83	Mitchell	50	57	SE	54	0	0	C	N	17		N	Y	S	L-M	L-M	L-M
84	Moffatt	138	55	SE	0	0	28	L	Y	26	N, S	Y	Y	S	L-M	L-M	L-M
85	Mud	145	55	NW	52	7	35	M,N	Y	12		Y	Y	S	M	M	M
86	Nelson 1	11	55	NE	22	0	94	M	N	3		N	Y	S	L-M	L-M	L
87	Nelson 2	4	55	NE	38	0	0	L	N	1		N	N	I	L	L	L
88	Newman North	585	57	SE	90	0	57	L	Y	23	S, I	Y	Y	L	H	H	VH
89	Newman South	642	57	SE	3	0	69	L,C	Y	70		Y	Y	L	H	H	VH
90	Newman West	90	57	SE	94	0	87	L	Y	4		Y	Y	L	H	H	H
91	Oregon	48	55	NW	13	0	68	M	Y	12		Y	Y	S	M	M	M
92	Otter 1	60	55	NE	66	0	0	M	N	9		Y	Y	S	L-M	L-M	L-M
93	Otter 2	13	55	NE	12	0	0	M	N	5		N	Y	S	L	L	L
94	Otter 3	16	55	NE	0	0	0	M	N	2		N	Y	S	L-M	L-M	L
95	Otter 4	15	55	NE	17	0	0	N	NA	NA		N	Y	S	L	L	L
96	Owens 1	35	55	NW	59	0	0	M,L	N	8		Y	Y	S	L-M	L-M	L-M
97	Owens 2	21	55	NW	79	0	100	M,C,L	N	3	I	Y	Y	S	M	M-H	M
98	Owens 3	6	55	NW	93	0	31	C	N	3		Y	Y	S	L-M	L-M	L
99	Panhandle	58	55	NE	76	97	NA	N	NA	NA		Y	Y	S	L-M	L-M	L-M
100	Panhandle N	60	55	NE	97	93	NA	N	NA	NA		Y	N	I	M	M	M
101	Penrith 1	4	55	NE	56	16	NA	N	NA	NA		N	Y	S	M	M	L
102	Penrith 2	5	55	NE	85	0	NA	N	NA	NA		Y	Y	S	M	M	L
103	Penrith 3	1	55	NE	1	0	NA	N	NA	NA		N	Y	S	L-M	L-M	L
104	Peone 1	5	55	SE	44	0	0	L	Y	2		N	Y	S	L-M	L-M	L
105	Peone 2	29	55	SE	3	0	0	L	N	8		N	N	I	L	L	L
106	Peone 3	8	55	SE	0	0	0	L	N	3		N	N	I	L	L	L
107	Progress	55	57	SE	0	0	0	C	Y	5		N	N	SW	L	L	L
108	Reflection	35	55	NE	72	0	0	M,L	Y	14		N	Y	S	M	M	M

**Table 3-2. Potential Wetland Project Site Information and Ranking, continued**  
(see report Section 3.2 for code descriptions)

Site	Name	Acres	WRIA	Area	NWI %	Wet Soil %	Drained Soil %	CARA	FEMA Q3	Owners	Ownership	Drainage	Stream Alteration	Site Type	Water Dependability	Success Potential	Ranking
109	Regal	28	57	SW	0	0	0	C	Y	6		N	N	SW	L	L	L
110	Rutter 1	36	55	SW	80	0	0	C,M	Y	10	P	Y	Y	S	M-H	M-H	M
111	Rutter 2	6	55	SW	97	0	0	C,M	Y	1		N	Y	S	M-H	M-H	L
112	Sacheen E	24	55	NE	68	0	NA	N	NA	NA		Y	N	I	L-M	L-M	L-M
113	Sacheen N	27	55	NE	67	68	NA	N	NA	NA		Y	N	I	L	L	L
114	Sacheen S	145	55	NE	70	11	NA	N	NA	NA		Y	Y	S	M-H	H	H
115	Saltese North	14	57	SE	0	0	0	C	N	6		N	N	I	L	L	L
116	Sands	28	55	NE	0	0	66	L,M	N	5		Y	Y	S	L-M	L-M	L-M
117	Scotia	11	55	NE	58	0	NA	N	NA	NA	I	N	Y	S	L-M	L-M	L
118	Scotia SW	10	55	NE	20	19	NA	N	NA	NA		N	N	I	L	L	L
119	Scotia W	13	55	NE	26	0	NA	N	NA	NA		Y	Y	S	L-M	L-M	L-M
120	Stateline	63	57	SE	11	0	66	L	N	11		N	Y	S	L-M	L-M	L-M
121	Tweedie	11	57	NE	91	0	NA	N	NA	NA		N	N	L	H	H	M
122	Tweedie West	214	57	NE	47	62	NA	N	NA	NA		Y	Y	S	L-M	L-M	M
123	Wastewater	28	55	NE	0	0	NA	N	NA	NA		N	N	I	M	M	L
124	Wildrose 1	29	55	SW	5	0	0	M	N	2		N	N	I	L-M	L-M	L-M
125	Wildrose 2	22	55	SW	1	0	59	M	Y	7		Y	Y	S	L-M	L-M	L-M
126	Wildrose 3	28	55	SW	17	0	40	M	Y	2		Y	Y	S	L-M	L-M	L-M
127	Wildrose 4	51	55	SW	25	0	37	M	Y	4		Y	Y	S	L	L	L
128	Wildrose 5	13	55	SW	46	0	45	M,L	N	3		N	Y	S	L	L	L
129	Woolard 1	66	55	SE	0	0	0	C,M	Y	5		Y	Y	S	L	L	L
130	Woolard 2	13	55	SE	76	0	0	M	Y	1		N	Y	S	L	L	L
	TOTAL	6029															

**NWI%**

This is the percentage of the potential wetland project site classified as wetland by the National Wetland Inventory. Potential wetland project sites were delineated to try and exclude areas that would currently qualify as wetland. Sites with high percentages in this category suggest that aerial photograph interpretation is difficult and field verification is needed to determine the actual wetland distribution.

U.S. Army Corps of Engineers wetland delineation methods require verifying wetland soil, vegetation and hydrologic conditions in the field. This category was also compared with the Wet Soil% which often revealed conflicting information.

**Wet Soil%**

The percentage of the potential wetland project site classified as wet soils by the USDA Soil Survey (includes *hydric, very poorly drained and poorly drained soils* and does not include areas indicated as *drained soils*). Sites with high percentages of wet soils require field verification of wetland soil, vegetation, and hydrologic conditions to confirm wetland presence.

**Drained Soil%**

The percentage of the potential wetland project site classified as drained soils on the USDA Soil Survey. Note that drained soil mapping units occurred in the Spokane County Soil Survey but not in either the Stevens County or Pend Oreille County surveys. It is not known whether drained soils do not occur in these two counties or whether soil scientists declined to identify them. Drained soil % is listed as NA (not available) for these counties on Table 3.2). The majority of the WRIA 55/57 area is located in Spokane County.

**CARA (Critical Aquifer Recharge Area)**

This designation indicates whether any portion of the potential wetland project site is designated as a Critical Aquifer Recharge Area under the Spokane County Critical Areas Ordinance. Codes are: C=Critical Aquifer Recharge Area, M=Moderate potential for aquifer recharge, Low=Low potential for aquifer recharge, N= Not listed (including sites outside Spokane County). Potential wetland project sites with a C or M designation were ranked higher.

**FEMA**

This designation indicates whether any portion of the potential wetland project site occurs within the FEMA Q3 flood zone. Codes are: Y=yes, N=no, NA=not available (sites outside Spokane County). This designation was included for information and not used in ranking.

**Owners**

This designation indicates the number of owners within the potential wetland project site. Sites with many owners are generally more difficult as wetland project sites. This designation was included for information and was not used in ranking.

**Ownership**

This designation was included to identify potential wetland project sites that already are in public ownership, have conservation easements, or are subject to other restrictions that prevent development for most purposes but that would still allow wetland restoration or creation. These sites are less expensive for potential wetland site construction since the property does not need to be purchased. Eleven sites were

identified that have at least partial public ownership by the Washington Department of Fish and Wildlife (F), Washington State Parks (P), Washington Department of Natural Resources (N), or Spokane County (S). Three sites were identified that are at least partially covered by conservation easements held by the Inland Northwest Land Trust (I).

### **Drainage**

This designation indicates whether aerial photographs reveal the presence of a drainage system. Drained areas are usually the easiest to convert to wetlands and have the highest potential for success. Codes are: Y=yes, N=no. Areas with evidence of drainage systems were ranked higher.

### **Stream Alteration**

This designation indicates whether aerial photographs indicate stream, floodplain or riparian area alterations. This may include stream straightening, stream relocation, stream or floodplain narrowing, riparian vegetation removal or other riparian modification. Codes are: Y=yes, N=no. Many of these alterations were conducted to facilitate cultivation. It is often feasible to re-establish meander patterns, riparian vegetation and streamside wetlands on these sites. Areas with evidence of stream alterations were not necessarily ranked higher but were evaluated on an individual basis and included for information purposes.

### **Site Type**

Sites were designated in four categories: Lake proximity (L), Stream proximity (S), Isolated (I) and Storm water (SW). Lake proximity sites are located surrounding lakes. Stream proximity sites are located adjacent to streams, usually on low terraces. Storm water sites are located where storm water collects and infiltrates. Isolated site designation refers to Water Dependability and Success Potential in that sites adjacent to lakes usually are ranked high in these categories. Sites adjacent to streams are ranked higher when the site is near the same elevation as the stream, when the stream has significant flow and when there are fewer downstream water users with higher priority water rights. Isolated and Storm water sites are ranked lower since these have less dependable water sources. See the Water Dependability and Success Potential discussions for further information.

### **Water Dependability and Storage Potential**

This designation indicates the dependability of available water to sustain wetlands. Codes are: H=High, M=Medium, L=Low. Sites adjacent to lakes and rivers are rated highest, sites adjacent to the larger perennial streams are ranked medium and other sites are ranked lower. Sites ranked lower include those along smaller streams, isolated wetland areas and storm water discharge/infiltration areas. An important component of water dependability not included in this evaluation is water rights which requires a more detailed evaluation for individual sites than was possible for this evaluation. Water rights will be considered for sites selected for future study. Water storage potential was also considered in this ranking. Larger sites were ranked higher. Sites with the potential for open water areas were also ranked higher since more water can be stored in open water areas than in the pore spaces of saturated wetlands.

### **Success Potential**

Using professional judgment and taking into account all factors, we ranked the likelihood of successfully establishing wetlands within the potential wetland project site. Codes are: VH=Very High, H=High, M=Medium, L=Low. Sites adjacent to lakes and rivers are rated highest, sites adjacent to the larger perennial streams are ranked medium and other sites are ranked lower. Sites ranked lower include those along smaller streams, isolated wetland areas and storm water discharge/infiltration areas. Sites with



fewer landowners were rated higher. Sites with fewer potential water right objectors downstream were ranked higher.

## Ranking

Using professional judgment and taking into account all factors we ranked all sites to identify the most promising for further evaluation. Ranking methods are discussed in the following section. Codes are: VH=Very High, H=High, M=Medium, L=Low.

### 3.3 Potential Wetland Project Site Ranking and Future Evaluation

#### Site Ranking

Sites were ranked using professional judgment and the available information presented in this report. A more quantitative ranking system was not developed due to the broad nature and general quality of the existing information and the potential for fatal flaws related to other factors not evaluated at this time. These potential fatal flaws include water rights, owner goals, funding and others. Also considered in ranking was the desire to select sites across the entire WRIA 55/57 area representing a variety of drainages and site conditions. Sites with greater potential for water storage were ranked higher as determined by acreage and the opportunity for including open water areas.

#### Future Detailed Evaluation

The primary goal of ranking was to identify four sites for a more detailed evaluation of wetland development feasibility. These more detailed evaluations will include water rights, water quality, water storage potential, wetland identification, site history, land use, landowner contacts and other available information. Data not currently available but necessary for feasibility assessment, site evaluation, conceptual/final design, permitting and related purposes will be identified.

#### Sites Proposed for Future Detailed Evaluation

The four sites selected for more detailed evaluation are listed in **Table 3**. Two sites are located in WRIA 55 and two in WRIA 57. An alternative site for each of the four has also been identified in case a fatal flaw is discovered early in the detailed evaluation process.

**Table 3-3. Potential Wetland Sites and Alternates for Detailed Evaluation**

<u>Site</u>	<u>Acreage</u>	<u>Alternate Site</u>	<u>Acreage</u>
Diamond North	295	Sacheen South	145
Eloika Southeast+South	88	Eloika Southwest	24
Newman North	585	Newman South	642
Chester Creek	107	Stateline	63

The Diamond North site was selected due to its large size, potential for water storage, location at the head of the entire West Branch of the Little Spokane River drainage, potential for basin water transfer from the Pend Oreille River and potential to successfully increase water storage even if portions of the area are already classified as wetland. The Sacheen South site was chosen as an alternative due to its close proximity to the primary site within WRIA 55, large size, location high in the drainage, dependable water source and high potential for success.

The Eloika Southeast and South sites were selected for detailed evaluation together since they are adjacent to each other, and due to their large size and their location at a potential surface water storage project site. A separate evaluation is currently underway to determine the feasibility of surface water storage on a portion, or all, of this combined site. It is likely that either the surface water or wetland development will prove feasible. This site is also favored due to its dependable water supply, water storage potential, historical wetland character and high potential for success. The Eloika Southwest site was chosen as an alternate due to its close proximity to the primary site within WRIA 55 and hydrologic connection to any potential surface water project.

The Newman Lake site was selected for detailed evaluation due to its large size, dependable water supply, water storage potential, historical wetland character and partial public ownership. It is also located adjacent to a successful wetland restoration project. Waters leaving this area also have a high probability to recharge the aquifer and augment river flows without diversion by other water users. The Newman north site was selected as an alternate due to its close proximity to the primary site within WRIA 57 and similar favorable characteristics.

The Chester site was selected for detailed evaluation due to its large size and as an example of a stream proximity site whereas the other sites are all lake proximity sites. This evaluation would provide a comparison in project goals between these two site types. The Stateline site was selected an alternate due to its location within WRIA 57 and its similar character as a creek proximity site.

#### **4.0 SUMMARY**

This study identified 130 potential wetland project sites covering approximately 6,000 acres in WRIs 55 and 57 of eastern Washington State. The 6,000 acres also approximates the acreage of wetland loss estimated for this area. Although not all sites, and not all portions of all sites, will prove feasible for wetland restoration or creation, many of them will. Four sites and four alternates have been identified to undergo more detailed evaluation, possibly leading to eventual design and construction.

Identifying potential wetland development sites is often a long and frustrating process. This study provides a resource for all organizations seeking to create wetlands to replace those lost, to increase wetland habitat, and to promote water quality. These organizations are likely to include government agencies, water utilities, conservation districts, fish and wildlife groups, lands trusts and other conservation easement holders, and others. The sites identified in this study provide a starting point for many potentially successful future wetland restoration and creation projects.

## **5.0 REFERENCES**

- Golder, 2003a. Little Spokane (WRIA 55) and Middle Spokane (WRIA 57) Watershed Planning, Phase II – Level 1 Assessment, Data Compilation and Preliminary Analysis. Prepared by Golder Associates for Spokane County and the WRIA 55 and 57 Planning Unit. June.
- Golder, 2003b. Little Spokane River Basin (WRIA 55) Instream Flow Needs Assessment. Prepared by Golder Associates. December
- Golder, 2004. Final Storage Assessment, Little and Middle Spokane Watersheds. Prepared by Golder Associates Inc. for Spokane County and WRIA 55 and 57 Planning Unit. December 2004. 77p.
- Spokane County. 2006. Watershed Management Plan: Water Resource Inventory Area 55-Little Spokane River & Water Resource Inventory Area 57-Middle Spokane River. 120p.
- Spokane County. 2006. 2006 NAIP Detailed Air Photos (USDA/FSA – Aerial Photography Field Office). Obtained digitally from Spokane County GIS Department.
- Spokane County. 2008. FEMA Q3 Flood Data. Obtained digitally from Spokane County GIS Department.
- Spokane County. 2007. Critical Areas Ordinance Maps. Obtained digitally from Spokane County GIS Department.
- USDA Soil Conservation Service. 2006. SSURGO Digital Soil Survey Data for Spokane County, Washington. Obtained from NRCS Web site.
- USDA Soil Conservation Service. 2006. SSURGO Digital Soil Survey Data for Stevens County, Washington. Obtained from NRCS Web site.
- USDA Soil Conservation Service. 2007. SSURGO Digital Soil Survey Data for Pend Oreille County, Washington. Obtained from NRCS Web site.
- US Fish & Wildlife Service. 1983. National Wetland Inventory Maps. Obtained from Spokane County GIS Department.

## Appendix A

### Digital Map of NWI Current Wetlands

The digital map of National Wetland Inventory Wetlands has been provided as a pdf file on the CD included with this report. This digital version allows the user to zoom in on individual sites to view them in greater detail. Users may also print this file at whatever size they require.

## **Appendix B**

### **Digital Map of USDA Wet and Drained Soils**

The digital map of USDA Wet and Drained Soils has been provided as a pdf file on the CD included with this report. This digital version allows the user to zoom in on individual sites to view them in greater detail. Users may also print this file at whatever size they require.

## Appendix C

# Digital Map of Potential Wetland Project Sites in WRIA 55 and 57

The digital map of Potential Wetland Project Sites has been provided as a pdf file on the CD included with this report. This digital version allows the user to zoom in on individual sites to view them in greater detail. Users may also print this file at whatever size they require.

Also included on the CD is a folder (Appendix G) with a shapefile version of the Potential Wetland Project Sites so GIS and CADD users can view it in combination with other layers of interest.

## Appendix D

# Digital Air Photos of Individual Potential Wetland Project Sites

The attached CD contains digital versions of air photos illustrating the location and extent of each site. Note that the boundaries of potential wetland project sites are approximate. Further investigation may reveal that the actual potential site is smaller or larger and that the boundaries are different than those illustrated here.

## **Appendix E**

# **Digital Ground Photos of Potential Wetland Project Sites**

The attached CD contains digital versions of ground photos for representative sites.



## Appendix F

### Digital Version of this Report

The attached CD includes a digital version of this report in WORD format. Users may wish to use it for a variety of purposes such as re-sorting Table 3-1 by individual criteria such as acreage or site type.

## Appendix G

# Shapefile Version of Potential Wetland Project Sites in WRIA 55 and 57

This shapefile version of the Potential Wetland Project Sites in WRIA 55 and 57 is provided on the attached CD for use in GIS and CADD systems.