



Wildlife Lake Habitat Survey: Pat Zakovec Waterfowl Impoundment

Prepared by:
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Technical Report 07-04
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1854 Treaty Authority
Biological Services Division
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Wildlife Lake Habitat Survey Information

Lake Name: Pat Zakovec Waterfowl Impoundment

DOW Lake ID #: 69146300

Survey Date: 8/3/06 & 8/8/06

Survey Type: Wildlife Lake Habitat Survey

Survey Crew: Angela Aarhus (1854 Treaty Authority, 8/3/06 & 8/8/06), Penny Backman (MDNR, 8/8/06), & Rick Gitar (Fond du Lac Environmental Program, 8/3/06)

Location Description

Legal Description:

Township: 66N **Range:** 18W **Section:** 7 & 18

Primary County: St. Louis

DNR Work Area Name: Orr

DNR Wildlife Work Area: Int'l Falls

General DOW Lake Information

Basin Area (acres): 61

Major Watershed: Vermilion River 73

PWI Class: O

Number of Public Accesses: 1

DOW Wetland Type: 5

Minor Watershed: 7301200

USGS Quad: Elephant (F19b)

Miles of Shoreline: ~ 2.3

Survey Maximum Lake Depth (ft): 4.0

Survey Mean Lake Depth (ft): 1.7

Survey Maximum Secchi Depth (ft): 4.0

Survey Mean Secchi Depth (ft): 1.5

DOW Maximum Lake Depth (ft): n/a

DOW Mean Lake Depth (ft): n/a

Lake Survey Conditions

Survey Date: 8/3/06

Start Time: ~10:30

Temperature Air / Water (F): 81 / --

Sky Conditions: 30% Cloudy

Wind Speed (mph): 5-10

Wind Direction: NE

Survey Date: 8/8/06

Start Time: 07:44

Temperature Air / Water (F): 65 / 68

Sky Conditions: 0% Cloudy

Wind Speed (mph): Calm

Wind Direction: --

Previous Lake Survey Information:

Type of Survey	Year	Date
Biological Assessment	1998	6/19/98
Biological Assessment	1999	6/24/99
Wildlife Lake Survey	2006	8/3/06 & 8/8/06

Survey Crew
1854 Treaty Authority
1854 Treaty Authority
A. Aarhus (1854 Treaty Authority),
P. Backman (MDNR), R. Gitar (FDL)

Lake Survey Access Information:

Ownership: USFS

Access Type: Earthen

Description: Canoe access off FS Road 203. Gated access road (USFS lock) leads to water control structure where canoe accessibility is also available.

Inlets and Outlets Information

Inlet Information

Elephant Creek flows from Elephant Lake to Bug Creek.

Outlet Information

A concrete dam (24" gate in 45' rock gabion weir) was constructed at a natural constriction on the flowage between Elephant and Bug Creeks (which flows into the Vermilion River). Approximately 70 acres of land were flooded to form the impoundment. Water level is manipulated by a steel culvert with screw gate control structure.

Additional Comments

The creation of the Pat Zakovec waterfowl impoundment in 1991 was a cooperative effort between the 1854 Treaty Authority, St. Louis County, Minnesota DNR, Bureau of Indian Affairs, US Fish and Wildlife Service, and US Forest Service. In fall 1997, water was drawn down in preparation for a prescribed burn, as well as for water control structure repairs (not completed until 2000). As planned, a prescribed burn took place in spring 1998 to improve the quality of nesting habitat available to breeding waterfowl. In summer 1999, a millet and buckwheat food plot was planted in the open field adjacent to the dam, but ultimately failed. After several attempts (fall 2000/2001/2002, & spring 2003) to seed wild rice for waterfowl food, rice was successfully seeded in a portion of the impoundment in fall 2003. Wild rice growth has been good each year since. Another controlled burn took place in spring 2006 in which 70 acres of dense upland vegetation immediately surrounding the impoundment were burned to create the desired open, grassy habitat required by waterfowl and many ground nesting birds. Bluebird and waterfowl nesting structures are annually maintained and monitored for production.

Water Level and Quality

Water Level Information

Water Level Reading Date: 8/3/06

Code: G

Benchmark/Gauge Description: Water depth gauge installed on 5/17/06 (initial depth was 30 inches) by sinking a five-foot section of PVC pipe, marked in one-inch increments, into the lake bottom near the water control structure (522611E, 5339640N)

Water Level Reading (feet + or -): 36 (gauge reading) – 10 (portion of gauge sunken in muck)

Current Water Level (inches): 26

Water Level Description: Water level at time of survey was 4 inches lower than the depth originally recorded on 5/17/06.

Water Quality Information

Sample Date: 8/8/06

Lake or Inlet (L or I): L

Station Number of Water Measurements: 70

Depth Measurements Taken: Just below water surface

Bottom Depth (ft): 2.5

Conductivity (umhos): 71.1

Dissolved Oxygen (mg/L): 7.9 (94%)

pH: 7.5

Total Dissolved Solids (ppm): 47.4

Water Color Description: Light brown - fairly clear

Comments: No water samples collected for further lab analysis.

Observations and Field Notes

Waterfowl Observations:

8/3/06: Observed 11 adult geese, a ring-necked hen with four ducklings, and another ring-necked hen with three ducklings.

8/8/06: Observed one male blue-winged teal, one hen mallard, one mallard flyover, two ring-necked ducks flushed, two flocks of geese (with eight and four individuals), and three ring-necked hens with broods (n=11 total).

Other Wildlife Observations:

8/3/06: Observed an eastern kingbird, a northern flicker, and a painted turtle. Sighting of hawk flying overhead.

8/8/06: Observed a female pied-billed grebe with one young, an eastern kingbird, an osprey flyover, several red-winged blackbirds, a great blue heron, and a mature bald eagle. An old beaver lodge near veg station 62 was likely being used by muskrats observed on a prior visit to the impoundment.

Field Notes:

Of the 87 original veg stations generated by ArcView, only those stations located in water (n=62) were surveyed in 2006. Three of the 62 stations (9, 21, and 32) surveyed were not accessible due to low water/thick muck, but adequate water was found nearby, so these stations were relocated (015, 016, and 002) and then surveyed.

A fairly even distribution of both floating and submerged vegetation was observed throughout the impoundment. Wild rice was distributed through a large portion of the main body of the impoundment, but wasn't very dense. Rice stalks were 2-3 feet tall with flowers and mostly empty kernels at time of survey. Some stalks had already been chewed off (probably by geese).

One unknown submergent plant found at 21 stations resembled submersed form of arrowhead, pickerelweed, or burreed, but could not be positively identified based on specimen collected. One unknown emergent plant found at station 16 could not be identified based on the specimen collected due to the absence of fruiting structure. A submersed, young form of yellow waterlily was observed at stations 43 and 62, but was combined with more common floating form for purposes of vegetation summary. Both narrowleaf and broadleaf cattails were observed growing along the shoreline near water control structure. Pickerelweed was observed growing in 12 distinct patches near the outlet, none of which overlapped with the survey points. The largest patches were located in the bay next to the dam. All pickerelweed patches were GPS'd on a previous visit to the impoundment.

Water clarity was good. Various minnows and leeches were seen in the water. Nineteen wooden duck houses in good condition were located on trees (n=11) and poles over water (n=8) throughout the impoundment. In addition, seven bluebird houses in good condition were mounted on trees bordering the northern edge of the open field next to the dam.

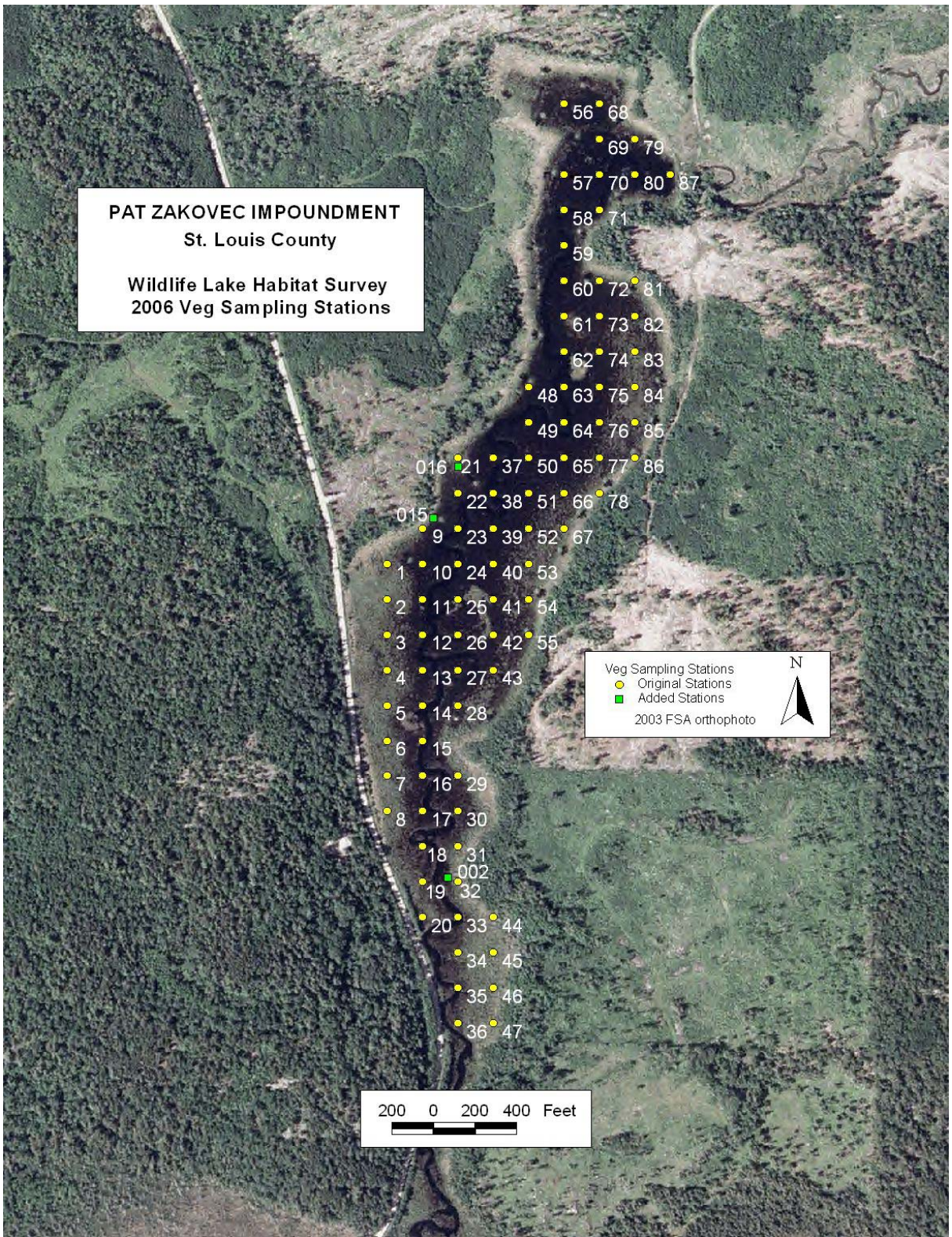


Figure 1. Map of 87 original veg sampling stations (yellow circles) generated by placing a grid (170 ft x 170 ft) over a 2003 FSA orthophoto of the Pat Zakovec Waterfowl Impoundment using ArcView software. Three additional veg stations (green squares) were surveyed in the field due to their close proximity to several original sampling stations deemed inaccessible.

**Wildlife Lake Sample Station Summary -
Pat Zakovec Waterfowl Impoundment
Survey Dates: 8/3/06 & 8/8/06**

Sample Station Information

Minimum Depth: 0.25	Minimum Secchi: 0.25	Initial Number of Stations: 87
Maximum Depth: 4.00	Maximum Secchi: 4.00	Number of Stations Sampled: 62
Mean Depth: 1.7	Mean Secchi: 1.5	

Vegetation Summary

Number of Sample Stations: 62
Lakewide Species Richness: 36
Percent of Vegetated Plots: 100%

Vegetation Species	# of Plots Occurring	Species			Frequency	
		Frequency (%)	95% CI	High C / I	Low C / I	Value
Elodea canadensis	61	98.4	0.0397	1.0235	0.9442	0.9839
Polygonum amphibium	47	75.8	0.1155	0.8736	0.6425	0.7581
Potamogeton zosteriformis	44	71.0	0.1220	0.8317	0.5877	0.7097
Ceratophyllum demersum	42	67.7	0.1254	0.8028	0.5520	0.6774
Nuphar variegata	39	62.9	0.1293	0.7583	0.4997	0.6290
Utricularia vulgaris	38	61.3	0.1303	0.7432	0.4826	0.6129
Zizania palustris	36	58.1	0.1319	0.7125	0.4487	0.5806
Sparganium eurycarpum	24	38.7	0.1303	0.5174	0.2568	0.3871
Unknown Submergent	21	33.9	0.1268	0.4655	0.2119	0.3387
Carex spp.	20	32.3	0.1254	0.4480	0.1972	0.3226
Lemna minor	17	27.4	0.1200	0.3942	0.1542	0.2742
Sagittaria cuneata	16	25.8	0.1179	0.3759	0.1402	0.2581
Utricularia intermedia	15	24.2	0.1155	0.3575	0.1264	0.2419
Potamogeton obtusifolius	14	22.6	0.1130	0.3388	0.1128	0.2258
Brasenia schreberi	12	19.4	0.1072	0.3008	0.0863	0.1935
Gramineae spp.	9	14.5	0.0965	0.2416	0.0487	0.1452
Potamogeton alpinus	8	12.9	0.0922	0.2212	0.0368	0.1290
Utricularia spp.	7	11.3	0.0875	0.2004	0.0254	0.1129
Sium suave	7	11.3	0.0875	0.2004	0.0254	0.1129
Salix spp.	6	9.7	0.0823	0.1790	0.0145	0.0968
Myriophyllum farwellii	6	9.7	0.0823	0.1790	0.0145	0.0968
Potentilla palustris	6	9.7	0.0823	0.1790	0.0145	0.0968
Sagittaria latifolia	4	6.5	0.0697	0.1342	-0.0052	0.0645
Scirpus cyperinus	4	6.5	0.0697	0.1342	-0.0052	0.0645
Typha angustifolia	3	4.8	0.0619	0.1103	-0.0135	0.0484
Stuckenia pectinata	3	4.8	0.0619	0.1103	-0.0135	0.0484
Pontederia cordata	2	3.2	0.0524	0.0847	-0.0201	0.0323
Polygonum EM spp.	2	3.2	0.0524	0.0847	-0.0201	0.0323
Eleocharis tenuis	2	3.2	0.0524	0.0847	-0.0201	0.0323
Spiraea alba	2	3.2	0.0524	0.0847	-0.0201	0.0323
Scutellaria spp.	1	1.6	0.0397	0.0558	-0.0235	0.0161
Galium spp.	1	1.6	0.0397	0.0558	-0.0235	0.0161
Cicuta bulbifera	1	1.6	0.0397	0.0558	-0.0235	0.0161
Potamogeton pusillus	1	1.6	0.0397	0.0558	-0.0235	0.0161
Potamogeton NL spp.	1	1.6	0.0397	0.0558	-0.0235	0.0161
Unknown Emergent	1	1.6	0.0397	0.0558	-0.0235	0.0161

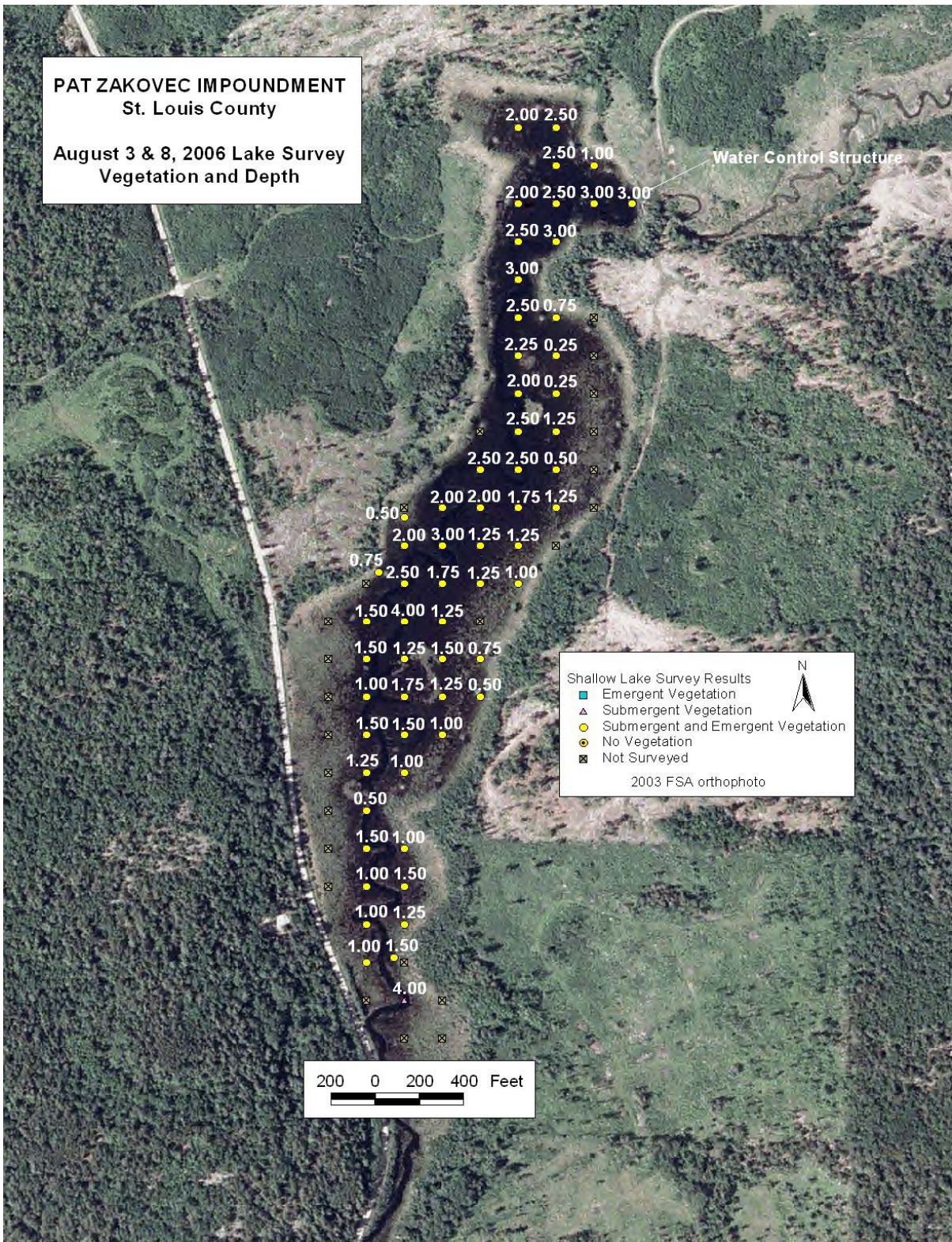


Figure 2. Vegetation and depth information collected during the wildlife lake habitat survey of Pat Zakovec Waterfowl Impoundment on August 3 and 8, 2006.

		STATION NUMBER	33	32(002)*	31	13	49	61	59	58	69	68	56	87	80	19	18	17	30	29
		DEPTH (ft)	4.00	1.50	1.25	1.50	2.50	2.25	3.00	2.50	2.50	2.50	2.00	3.00	3.00	1.00	1.00	1.00	1.50	1.00
		SECCHI (ft)	4.00	-	1.25	-	2.50	-	3.00	-	2.50	-	2.00	-	3.00	1.00	-	1.00	-	1.00
		ALGAE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TYPE	VEGETATION SPECIES	COMMON NAME																		
FF	Lemna minor	Lesser Duckweed	X	X	X								X			X	X		X	X
F	Brasenia schreberi	Water Shield					X	X			X	X	X	X		X				
F	Polygonum amphibium	Water Smartweed	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X
F/S	Nuphar variegata	Common Yellow Waterlily	X	X		X	X	X	X	X	X			X			X		X	X
S	Ceratophyllum demersum	Coontail	X		X				X	X	X		X			X	X	X	X	X
S	Elodea canadensis	Canada Waterweed	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S	Myriophyllum farwellii	Small-leaved Water Milfoil							X	X	X	X	X		X					
S	Potamogeton alpinus	Northern Pondweed (Alpine)				X					X				X					
S	Potamogeton NL spp.	Narrowleaf Pondweed Group														X				
S	Potamogeton obtusifolius	Bluntleaf Pondweed			X														X	
S	Potamogeton pusillus	Small Pondweed							X											
S	Potamogeton zosteriformis	Flatstem Pondweed				X	X	X	X	X		X	X		X		X		X	X
S	Stuckenia pectinata	Sago Pondweed														X		X	X	
S	Unknown Submergent	Unknown Submergent																X	X	
S	Utricularia intermedia	Bladderwort (intermedia)																		
S	Utricularia spp.	Bladderwort Group	X	X	X			X	X							X				
S	Utricularia vulgaris	Greater Bladderwort						X	X	X		X		X	X	X		X		
E	Carex spp.	Wide-Leaf Sedge		X												X		X	X	
E	Cicuta bulbifera	Bulb-Bearing Water Hemlock			X															
E	Eleocharis tenuis	Slender Spike-Rush																		X
E	Galium spp.	Bedstraw			X															
E	Gramineae spp.	Grasses (Graminae)			X													X		
E	Polygonum EM spp.	Emergent Smartweed Group		X																
E	Pontederia cordata	Pickerelweed					X													
E	Potentilla palustris	Swamp Fivefinger																		
E	Sagittaria cuneata	Arrowhead														X	X	X		
E	Sagittaria latifolia	Broad-Leaved Arrowhead		X	X															
E	Salix spp.	Willow			X											X		X		
E	Scirpus cyperinus	Wool Grass																		
E	Scutellaria spp.	Skullcap			X															
E	Sium suave	Water Parsnip		X	X															
E	Sparganium eurycarpum	Giant Burreed				X	X													X
E	Spiraea alba	Narrow-leaved Meadowsweet																		
E	Typha angustifolia	Narrowleaf Cattail																		
E	Unknown Emergent	Unknown Emergent																		
E	Zizania palustris	Wild Rice				X		X	X	X	X	X	X	X	X	X	X			
		<i>No vegetation found</i>																		
		STATION SPECIES RICHNESS	6	8	13	7	6	8	9	8	9	6	9	4	8	12	8	10	10	8

FF = Free-floating, F = Floating, F/S = Floating and Submerged, S = Submerged, E = Emergent; * Original station inaccessible, sampled new station in nearby water

		STATION NUMBER	16	15	14	28	42	27	43	55	26	12	11	10	9(015)*	23	24	25	41	54
		DEPTH (ft)	1.50	0.50	1.25	1.00	1.25	1.50	1.00	0.50	1.75	1.00	1.50	1.50	0.75	2.50	4.00	1.25	1.50	0.75
		SECCHI (ft)	-	0.50	-	1.00	-	1.50	-	0.50	-	1.00	-	1.50	-	2.50	-	1.25	-	0.75
		ALGAE	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X
TYPE	VEGETATION SPECIES	COMMON NAME																		
FF	Lemna minor	Lesser Duckweed	X			X		X		X				X	X					X
F	Brasenia schreberi	Water Shield																		
F	Polygonum amphibium	Water Smartweed		X	X	X	X	X	X	X	X	X	X	X				X	X	X
F/S	Nuphar variegata	Common Yellow Waterlily	X			X		X	X		X	X	X			X	X	X		
S	Ceratophyllum demersum	Coontail	X	X		X	X	X		X		X		X	X	X	X	X	X	X
S	Elodea canadensis	Canada Waterweed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S	Myriophyllum farwellii	Small-leaved Water Milfoil																		
S	Potamogeton alpinus	Northern Pondweed (Alpine)																		
S	Potamogeton NL spp.	Narrowleaf Pondweed Group																		
S	Potamogeton obtusifolius	Bluntleaf Pondweed		X			X			X										
S	Potamogeton pusillus	Small Pondweed																		
S	Potamogeton zosteriformis	Flatstem Pondweed	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		
S	Stuckenia pectinata	Sago Pondweed																		
S	Unknown Submergent	Unknown Submergent		X	X	X	X	X	X			X	X					X		X
S	Utricularia intermedia	Bladderwort (intermedia)						X							X					X
S	Utricularia spp.	Bladderwort Group																		
S	Utricularia vulgaris	Greater Bladderwort	X	X	X	X	X	X	X	X	X		X	X		X			X	X
E	Carex spp.	Wide-Leaf Sedge				X				X			X					X	X	X
E	Cicuta bulbifera	Bulb-Bearing Water Hemlock																		
E	Eleocharis tenuis	Slender Spike-Rush																X		
E	Galium spp.	Bedstraw																		
E	Gramineae spp.	Grasses (Graminae)				X				X								X	X	X
E	Polygonum EM spp.	Emergent Smartweed Group																		
E	Pontederia cordata	Pickerelweed																		
E	Potentilla palustris	Swamp Fivefinger																X	X	X
E	Sagittaria cuneata	Arrowhead				X			X	X			X							X
E	Sagittaria latifolia	Broad-Leaved Arrowhead													X				X	
E	Salix spp.	Willow				X												X		X
E	Scirpus cyperinus	Wool Grass																X		X
E	Scutellaria spp.	Skullcap																		
E	Sium suave	Water Parsnip		X								X		X						
E	Sparganium eurycarpum	Giant Burreed	X	X	X	X		X			X	X	X	X		X	X			
E	Spiraea alba	Narrow-leaved Meadowsweet								X										X
E	Typha angustifolia	Narrowleaf Cattail																X	X	
E	Unknown Emergent	Unknown Emergent	X																	
E	Zizania palustris	Wild Rice			X		X	X	X	X		X	X	X	X	X	X	X		
		<i>No vegetation found</i>																		
		STATION SPECIES RICHNESS	8	9	7	13	7	11	8	12	6	9	10	9	7	7	6	14	9	14

FF = Free-floating, F = Floating, F/S = Floating and Submerged, S = Submerged, E = Emergent; * Original station inaccessible, sampled new station in nearby water

		STATION NUMBER	40	67	52	51	50	66	77	76	75	74	73	72	60	79	70	71	57	62	63
		DEPTH (ft)	1.25	1.00	1.25	1.25	2.00	1.25	1.25	0.50	1.25	0.25	0.25	0.75	2.50	1.00	2.50	3.00	2.00	2.00	2.50
		SECCHI (ft)	-	1.00	-	1.25	-	1.25	-	0.50	-	0.25	-	0.75	-	1.00	-	2.75	-	2.00	-
		ALGAE	X					X	X	X	X	X	X	X		X	X			X	
TYPE	VEGETATION SPECIES	COMMON NAME																			
FF	Lemna minor	Lesser Duckweed		X																	
F	Brasenia schreberi	Water Shield						X		X				X							X
F	Polygonum amphibium	Water Smartweed	X		X	X	X			X	X	X	X	X		X	X				X
F/S	Nuphar variegata	Common Yellow Waterlily			X	X	X			X	X	X			X		X	X		X	X
S	Ceratophyllum demersum	Coontail	X	X	X	X		X	X		X	X				X		X	X	X	X
S	Elodea canadensis	Canada Waterweed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S	Myriophyllum farwellii	Small-leaved Water Milfoil																			
S	Potamogeton alpinus	Northern Pondweed (Alpine)											X							X	
S	Potamogeton NL spp.	Narrowleaf Pondweed Group																			
S	Potamogeton obtusifolius	Bluntleaf Pondweed		X	X			X	X		X			X			X			X	
S	Potamogeton pusillus	Small Pondweed																			
S	Potamogeton zosteriformis	Flatstem Pondweed			X	X	X		X			X	X	X	X		X	X	X	X	X
S	Stuckenia pectinata	Sago Pondweed																			
S	Unknown Submergent	Unknown Submergent	X	X	X			X	X	X		X		X							X
S	Utricularia intermedia	Bladderwort (intermedia)		X	X	X	X	X	X								X	X			X
S	Utricularia spp.	Bladderwort Group		X																	
S	Utricularia vulgaris	Greater Bladderwort	X		X	X		X	X		X				X		X	X	X		X
E	Carex spp.	Wide-Leaf Sedge	X	X				X	X	X	X	X		X		X					
E	Cicuta bulbifera	Bulb-Bearing Water Hemlock																			
E	Eleocharis tenuis	Slender Spike-Rush																			
E	Galium spp.	Bedstraw																			
E	Gramineae spp.	Grasses (Graminae)			X																
E	Polygonum EM spp.	Emergent Smartweed Group										X									
E	Pontederia cordata	Pickeralweed																			X
E	Potentilla palustris	Swamp Fivefinger		X				X													
E	Sagittaria cuneata	Arrowhead	X	X	X							X	X	X		X					
E	Sagittaria latifolia	Broad-Leaved Arrowhead																			
E	Salix spp.	Willow																			
E	Scirpus cyperinus	Wool Grass						X								X					
E	Scutellaria spp.	Skullcap																			
E	Sium suave	Water Parsnip	X		X																
E	Sparganium eurycarpum	Giant Burreed	X		X	X	X														X
E	Spiraea alba	Narrow-leaved Meadowsweet																			
E	Typha angustifolia	Narrowleaf Cattail												X							
E	Unknown Emergent	Unknown Emergent																			
E	Zizania palustris	Wild Rice	X											X	X	X	X	X	X	X	X
		<i>No vegetation found</i>																			
		STATION SPECIES RICHNESS	10	10	13	8	6	10	8	6	7	9	5	10	5	7	8	7	8	8	7

FF = Free-floating, F = Floating, F/S = Floating and Submerged, S = Submerged, E = Emergent; * Original station inaccessible, sampled new station in nearby water

Wildlife Lake Habitat Survey
 Pat Zakovec Waterfowl Impoundment
 St. Louis County

Date: 08/03/06 and 08/08/06
 Surveyors: A. Aarhus (1854 Authority),
 P. Backman (MDNR), R. Gitar (FDL)

		STATION NUMBER	64	65	37	38	39	22	21(016)*
		DEPTH (ft)	2.50	1.75	2.00	3.00	1.75	2.00	0.50
		SECCHI (ft)	2.50	-	2.00	-	1.75	-	0.50
		ALGAE		X	X	X	X		X
TYPE	VEGETATION SPECIES	COMMON NAME							
FF	Lemna minor	Lesser Duckweed							X
F	Brasenia schreberi	Water Shield							
F	Polygonum amphibium	Water Smartweed	X	X	X		X	X	X
F/S	Nuphar variegata	Common Yellow Waterlily	X	X	X	X	X	X	
S	Ceratophyllum demersum	Coontail	X			X	X	X	X
S	Elodea canadensis	Canada Waterweed	X	X	X	X	X	X	X
S	Myriophyllum farwellii	Small-leaved Water Milfoil							
S	Potamogeton alpinus	Northern Pondweed (Alpine)			X	X			X
S	Potamogeton NL spp.	Narrowleaf Pondweed Group							
S	Potamogeton obtusifolius	Bluntleaf Pondweed							X
S	Potamogeton pusillus	Small Pondweed							
S	Potamogeton zosteriformis	Flatstem Pondweed		X	X	X	X	X	
S	Stuckenia pectinata	Sago Pondweed							
S	Unknown Submergent	Unknown Submergent							
S	Utricularia intermedia	Bladderwort (intermedia)			X			X	X
S	Utricularia spp.	Bladderwort Group							
S	Utricularia vulgaris	Greater Bladderwort	X	X	X		X	X	X
E	Carex spp.	Wide-Leaf Sedge							X
E	Cicuta bulbifera	Bulb-Bearing Water Hemlock							
E	Eleocharis tenuis	Slender Spike-Rush							
E	Galium spp.	Bedstraw							
E	Gramineae spp.	Grasses (Graminae)							X
E	Polygonum EM spp.	Emergent Smartweed Group							
E	Pontederia cordata	Pickerelweed							
E	Potentilla palustris	Swamp Fivefinger							X
E	Sagittaria cuneata	Arrowhead							X
E	Sagittaria latifolia	Broad-Leaved Arrowhead							
E	Salix spp.	Willow							
E	Scirpus cyperinus	Wool Grass							
E	Scutellaria spp.	Skullcap							
E	Sium suave	Water Parsnip							
E	Sparganium eurycarpum	Giant Burreed	X	X	X	X	X		
E	Spiraea alba	Narrow-leaved Meadowsweet							
E	Typha angustifolia	Narrowleaf Cattail							
E	Unknown Emergent	Unknown Emergent							
E	Zizania palustris	Wild Rice			X	X		X	X
		<i>No vegetation found</i>							
		STATION SPECIES RICHNESS	6	6	9	7	7	8	13

FF = Free-floating, F = Floating, F/S = Floating and Submerged, S = Submerged, E = Emergent; * Original station inaccessible, sampled new station in nearby water