

M ~~15~~

May 15, 1998

Mike & Richard

I was able to visit nearly all of the pools during this trip including inlet streams at the M-28 bridges. A rough copy of the data is attached.

The results are similar to those of previous years for early spring with similar patterns of results from the North to South ~~mostly~~; i.e. a slight but consistent decline in ionic strength (conductivity), alkalinity, and hardness. Also the darkest color water tends to be in the northern most sample areas along with high iron and tannin.

Flow levels appear much lower than previous ~~may~~ early spring, as expected from low rainfall. Temperatures are also higher than expected at the sample points.

We had hoped to extend our stay through May 19 to visit with the USGS folks but find we cannot change critical appointments so will go to Ohio on 5/17.

Expect to return to the UP by June 12. Cat

We will be here at 586 6439 through Saturday 5/16.

Call if it's useful to talk

Regards E. Collier

Water Quality Data - Inlet streams North Side of Refuge
~~April~~ May 30, 1998

	1	2	3	4	5	6
	<u>Clark Ditch</u>	<u>Holland Ditch</u>	<u>Diggs River</u>	<u>Walsh Creek</u>	<u>Dugy Creek</u>	<u>Marsh Creek</u>
pH	6.85	7.22	7.37	7.17	6.63	6.63
Temp °C	9.6	7.9	10.4	9.3	11.3	11.7
Conductivity (µS/cm)	118	144	120	103	54	47
Alkalinity (mg/l)	40	58	46	37	22	17
Hardness (mg/l)	52	68	56	41	21	20
Iron (mg/l)	or	.93	1.1	or	.68	.44
FTU Color	61	21	1	22	14	5
Tannin (mg/l)	3.4	1.3	nr	1.5	1.4	nr
Colicatic LR	.45	1.26			.66	
or: over range > 1.3 mg/l						

1. very low flow / level
2. good flow / low level
3. Stead flow, normal level
4. good flow / low level (bottom sh gauge)
5. low flow / level
6. very low flow / level

Water Quality Data

W 8661, 1998

[illegible]

Unit 2, C-3 & Marsh Creek Pools Water Quality May 1998

	A-2	C-2	m-C	T-2	C-3	marsh creek Pool
pH	7.81	7.66	7.67	7.34	7.55	7.19
Temp (°C)	17.2	17.1	16.5	17.7	14.6	18.8
Conductivity (µs/cm)	72	55	42	28	79	37
Alkalinity (mg/l)	20	14	10	2	26	10
Hardness (mg/l)	19	18	12	6	25	12
Iron (mg/l)	.92	.46	.46	.21	.47	.64
Color (FTU)	17	11	10	17	6	17
Tannin						1.9
Silicate LR						.55

Water Quality Data Spur Pools
May 1998

	North <u>Big Spur</u>	Big Spur	Upper <u>South Spur</u>	Lower <u>South Spur</u>
pH	7.53 7.75	7.75	7.79	7.65
Temperature	19.8	19.2	20.0	21.1
Conductivity (uS/cm)	127	113	85	59
Alkalinity (mg/l)	35	39	31	17
Hardness (mg/l)	52	50	35	21
Iron (mg/l)	.91	.70	.42	.06
Silicate (mg/l)	.52	NR	NR	.24
Color (FTU)	20	25	3	13

Date Sampled 5/14/98

Unit 2 and Marsh Creek Pools Water Quality Data Sept., 1997 Seney National Wildlife Refuge

	<u>A-2</u>	<u>C-2</u>	<u>M-2</u>	<u>T-2</u>	<u>Marsh Creek</u>
					<u>Pool</u>
pH _{4/98}	7.8	7.75	7.84	7.08	7.33 7.19
Temp C	14.9	15.6	14.9	16.1	16.3 18.8
Conductivity	92	69	62	41	43 37
Alkalinity (mg/l)	41	36	32	7	15 10
Total Hardness	43	34	33	10	17 12
Iron (mg/l)	0.47	0.28	0.3	0.16	0.48 .64
Color (FTU)	16	9	12	21	13 17
Flow (comment)	none	none	none	none	none
Gage	7.1	2.8	no gage	no gage	no gage
	24-Sep	24-Sep	24-Sep	24-Sep	24-Sep

Water Quality Data C-3 Pool@ Walsh Ditch Inlet, Marsh Creek & Sweeney Ditch Spillways: Seney National Wildlife Refuge Sept. 1997

4/98 data

	<u>Walsh Ditch Bridge</u>	<u>Marsh Creek Spill</u>	<u>Sweeney Ditch Spill</u>	<u>Walsh Creek @ M-28</u>
pH	7.79 7.45	7.62	8.44 7.55	7.43 7.17
Temp C	13.3 10.9	14.5	18.1 14.6	14.3 9.3
Conductivity	157 138	159	147 79	144 103
Alkalinity (mg/l)	74 57	69	68 57	62 37
Hardness (mg/l)	84 NR	nr	nr 25	72 41
Iron (mg/l)	1.3 1.44	1.3	0.36 .17	<1.3 0.7
Tannin (mg/l)	2.3	1	1	1.3 1.5
Color (FTU)	33 16	15	0 6	33 22
Date sampled	18-Sep	18-Sep	18-Sep	18-Sep

Note: nr = analysis not run

Water Quality Data - Summary Inlet Streams to North Side of Refuge

	<u>Date</u>	<u>Clark Ditch</u>	<u>Holland Ditch</u>	<u>Driggs River</u>	<u>Walsh Creek</u>	<u>J -1 Inlet</u>
pH	8/6/96	7.52	7.93	7.92	7.87	7.76
	5/14/97	7.5	7.2	7.1	6.9	
	9/18/97	7.18	7.74	7.87	7.43	8.03
	4/30/98	6.85	7.22	7.37	7.17	7.83
Temperature C	8/6/96	20.3	19.3	19.3	19.2	23.9
	5/14/97	7.7	7.6	7.2	6.8	
	9/18/97	14.6	13.7	13.7	14.3	17.2
	4/30/98	9.6	7.9	10.4	9.3	10.1
Conductivity	8/6/96	150	118	105	63	134
	10/17/96	143	153	155	nr	
	5/14/97	100	85	72	59	
	9/18/97	126	171	132	144	158
	4/30/98	118	144	120	103	154
Alkalinity (mg/l)	8/6/96	52	48	40	42	57
	5/14/97	35	42	26	17	
	9/18/97	47	64	56	62	68
	4/30/98	40	53	46	37	47
Hardness (mg/l)	8/6/97	60	59	42	48	
	5/14/97	50	38	69	22	
	9/18/97	60	nr	nr	72	
	4/30/98	52	68	56	41	52
Iron (mg/l)	8/6/96	or	or	or	0.66	
	5/14/97	5.3 *	1.65 *	1.8 *	nr	
	9/18/97	or	or	0.65	or	
	4/30/98	or	0.93	1.1	or	1.3
Tannin (mg/l)	8/6/96	6.5	2.9	4.1	3.2	
	9/18/97	3.5	1.1	0.5	1.3	
Color (FTU)	8/6/96	198	63	52	39	97
	10/17/96	47	15	22	nr	
	5/14/97	57	20	56	17	
	9/18/97	67	22	15	33	59
	4/30/98	61	21	1	22	22

Note: Clark, Holland, and Walsh sampled at M -28 bridges; Driggs at the Diversion ditch bridge

nr = not run; or = over range of analytical method; * = sample diluted to approximate the iron level

Seney Refuge --Unit 2 and C-3 Pools Selected Data -- Comparison of Sampling Periods

	<u>A-2</u>	<u>C-2</u>	<u>M-2</u>	<u>T-2</u>	<u>C-3</u>
May-95	6.9	7.2	7.7	7.2	nr
June/July-95	7.8	7.5	6.7	7.1	8.2
Sept/Oct-95	7.9	7.8	7.7	7.3	8.1
May-96	6.9	6.7	6.8	6.9	6.9
Aug-96	7.5	7.9	7.7	7.5	8
June-97	7.2	7.9	7.5	7.6	6.9
Sept-97	7.8	7.8	7.8	7.1	8.4
<u>Temperature</u> 5/98	7.8	7.7	7.7	7.3	7.6
May-95	15.9	15.9	17.4	16.1	nr
June/July-95	24	24	23	22.5	22
Sept/Oct-95	12	12	12	12.1	11.9
May-96	14.8	14.3	15.7	17.1	14.4
Aug-96	21.7	22.9	22.8	23.6	24.1
June-97	21.9	22	22.2	22.5	21.7
Sept-97	14.9	15.6	14.9	16.1	18.1
<u>Conductivity</u> 5/98	17.2	17.1	16.5	17.7	14.6
May-95	62	63	54	35	nr
June/July-95	88	78	72	44	122
Sept/Oct-95	100	93	69	33	139
May-96	62	48	42	19	71
Aug-96	186	140	104	28	106
June-97	86	67	59	24	159
Sept-97	92	69	62	41	147
<u>Alkalinity</u> 5/98	72	55	42	28	79
May-95	18	20	14	5	nr
June/July-95	40	41	30	28	40
Sept/Oct-95	46	36	27	8	56
May-96	21	12	16	4	28
Aug-96	82	64	36	5	44
June-97	39	27	26	5	76
Sept-97	41	36	32	7	68
<u>Turbidity</u> 5/98	20	14	10	2	26
June/July-95	11	14	15	6	17
Sept/Oct-95	24	0	4	10	8
May-96	29	22	19	21	21
Aug-96	214	61	47	15	26
Jun97	26	16	17	22	14
Sept-97	16	9	12	21	0
<u>Iron</u> 5/98	17	11	10	17	6
May-95	0.66	0.57	0.67	0	nr
June/July-95	1.14	0.63	0.95	0.23	0.48
Sept/Oct-95	0.83	0.11	0.33	0.07	0.55
June-97	1.68	0.31	1.11	0.49	1.39
Sept-97	0.47	0.28	0.3	0.16	0.36
5/98	.92	.46	.46	.21	.47

SEN18.XLS

Unit 1 Pools: Selected Data 1995/96/97

	<u>J-1 Ditch</u>	<u>J1-I1</u>	<u>I1-F1</u>	<u>F1-E1</u>	<u>H1-E1</u>	<u>E1-C1</u>	<u>C1-B1</u>	<u>B1-A1</u>	<u>A1</u>	<u>G1-D1</u>	<u>D1</u>
<u>pH</u>											
May 95	6.7	6.9	6.8	6.6	8.4	7.1	7.2	7.2	6.9	8	7.3
June/July 95	7.5	7.7	7.4	7.7	8	7.7	7.9	7.9	7.4	7.9	7.3
August 95	7.3	nr	7.7	8.9	nr	nr	8.5	9.6	7.6	nr	9
Sept/Oct 95	7.2	7.9	8.4	8.3	8.5	8	7.7	7.6	7.6	8.1	7.7
May-96	6.9	6.8	6.8	7.1	6.7	nr	7.1	7.1	6.7	6.9	6.7
Aug-96	7.8	8.7	8.1	8.9	8.9	8.4	8.3	8.1	7.7	7.9	8.7
June-97	6.8	7.1	7.1	6.9	6.7	7.7	7.4	7.7	7.4	7.2	7.5
Sept-97	8	9	8.2	8.6	7.7	8.5	7.8	8.9	7.3	6.7	8.8
Temperature 5/4/98	7.8	7.9	7.7	7.8	7.6	7.9	7.7	8.5	7.5	7.5	7.8
May 95	13.6	15.5	17.9	12.7	12.9	15.8	15.9	14.5	13.5	15.1	15
June/July 95	18.4	22	21	22	21.5	19	22	20	20	21	22.5
August 95	23.9	nr	24.5	26.7	nr	nr	29.9	27.4	26.1	nr	25.3
Sept/Oct 95	17.9	15.5	15	11.6	12.1	11.1	9.4	12.2	12.5	12	12.5
May-96	11.6	12.7	12.9	14.8	17.1	nr	19.1	15.1	15.1	18.3	15.9
Aug-96	20.1	21.4	22.1	21.8	22.6	22.7	22.7	23.4	23.2	22.5	22.3
June-97	16.7	19.9	21.3	21.1	22	24.8	24.3	22.9	23.8	22.6	22.5
Sept-97	17.2	14.4	14.5	14.8	13.1	12.8	13.8	13.8	13.8	13.7	14.3
Conductivity 5/4/98	10.1	14.2	15.7	16.0	18.5	22.1	21.1	18.3	20.2	18.5	19.8
May 95	110	98	80	274	105	104	106	84	95	87	72
June/July 95	172	130	121	119	128	111	132	101	116	106	84
August 95	185	151	121	125	nr	nr	113	97	113	nr	79
Sept/Oct 95	172	150	110	121	143	115	126	106	102	114	82
May-96	96	89	74	69	66	nr	62	53	54	54	44
Aug-96	134	162	160	149	137	146	136	128	126	179	108
June-97	174	138	108	104	125	91	101	81	91	75	65
Sept-97	158	129	132	116	145	105	109	84	92	110	65
Alkalinity 5/4/98	153	112	85	81	106	84	76	69	72	58	54
May 95	34	28	150*	40	40	125*	43	28	37	26	23
June/July 95	73	58	60	52	56	54	58	45	60	46	32
August 95	84	nr	53	58	nr	nr	44	38	50	nr	30
Sept/Oct 95	70	66	52	47	56	46	49	42	40	46	31
May-96	30	38	25	26	24	nr	21	15	18	21	14
Aug-96	57	68	60	64	56	59	50	57	56	80	44
June-97	74	57	53	48	67	40	46	36	42	42	28
Sept-97	68	60	42	68	44	44	44	34	43	53	28
Turbidity 5/4/98	47	38	3.5	3.0	3.3	3.0	2.5	2.1	2.7	1.0	1.4
June/July 95	57	33	56	52	10	6	6	9	10	7	0
August 95	83	nr	33	25	nr	nr	14	11	11	nr	22
Sept/Oct 95	85	23	20	22	0	2	0	5	27	4	0
May-96	13	26	20	19	10	nr	16	12	13	13	14
Aug-96	97	67	102	77	18	54	38	24	28	58	8
June-97	35	25	24	19	10	10	18	7	7	10	5
Sept-97	59	10	2	1	15	0	1	2	2	9	2
Iron 5/4/98	22	18	9	8	13	6	17	8	11	16	10
May 95	1.68	0.87	1	0.57	0.53	0.31	0.52	0.3	0.31	0.94	0.24
June/July 95	1.3	0.98	1.2	1.2	0.5	0.31	0.34	0.51	0.56	0.85	0.28
August 95	1.3	nr	1.3	0.87	nr	nr	0.38	nr	nr	nr	0.23
Sept/Oct 95	>1.3	>1.3	0.44	0.28	0.13	0.1	0.16	0.18	0.28	0.22	0.09
May-96	1.01	1.05	1.08	1.01	nr	nr	nr	nr	nr	nr	nr
June-97	5.2	1.55	1.4	1.11	0.44	0.37	0.27	0.51	0.42	0.44	0.23
Sept-97	>1.3	0.31	0.25	0.25	0.64	0.48	0.16	0.25	0.36	0.44	0.09
* data suspect	nr = not run										
5/4/98	1.3	1.0	1.52	1.83	1.78	1.17	1.26	1.19	1.34	1.45	1.18

Seney National Wildlife Refuge Water Quality Data - June 1996 Spur Pools & Marsh Creek Pool

	<u>North Spur</u>		<u>Big Spur</u>	<u>N. Mid</u>		<u>S. Mid</u>	<u>Upper S.</u>		<u>Lower S.</u>	<u>Marsh Creek</u>	<u>I-2 West</u>	<u>Delta Creek Oct-96</u>
pH	7.46	7.53	7.6	7.75	7.9	7.2	7.5	7.7	7.4	7.1	8.42	7
Retest 10/96	6.8		6.8						7	6.9		
Temperature C	21.3	19.8	21.7	19.2	22.6	23.1	23.7	20.0	20.2	21.1	21.2	11.7
Retest 10/96	4.6		6.6				5.8		5.7	11.4		
Conductivity	167	127	166	113	129	128	121	85	66	59	26	104
Retest 10/96	106		140				101		85	99		
Alkalinity	69	35	69	39	50	56	50	31	30	17	5	42
Retest 10/96	50		55				42		31	34		
Total Hardness	77	52	75	50	52	59	50	35	25	21	6	44
Retest 10/96	57		64				46		37	44		
Turbidity	63	20	70	25	27	28	22	3	10	13	15	46
Retest 10/96	49		45				8		7	42		
Iron	1.18	.91	**	.70	-	-	-	.42	**	.06	0.73	1.34
Retest 10/96	**		**				0.15		0.05	**	-	
Phosphate	0.06		0.1		-	-	-		0.1	.11	-	
Dissolved O2	4.8		**		-	-	-		6.8	-	-	
Silicate	0.87	.52			-	-	-		0.36	.24	-	0.9
Tannin 10/96	0.9		1.1		-	-	0.9		1	1.5	-	

** Over range of method > 1.3 gm/l for iron and > 1.6 mg/l for silicate

may 14, 1998 date

Comments on Water Quality

Inlet streams along M-28

Clark & Holland ditches appear to feed the Unit 1 Pools most from Holland based on observed flow at the M-28 bridges. Also samples from J-1 inlet are similar to Holland for conductivity ~~and~~ alkalinity.

Water color from Clark ditch is noticeably darker than Holland and contains high iron and TSS levels. Much of the iron deposits in the upper Unit 1 pools probably originates from the Clark ditch.

Unit 1 Pools

^{pH} generally increases from May to August. and ~~drops~~
eg: (6.7 - 7.1 in May 96 and 7.7 to 8.9 in August 96)
No pattern is observed through the pools.

Conductivity - Increases May to August (~ doubles)
Tends to decrease through the pools at each sampling.

Alkalinity - Increases May to August (more than doubles)
Tends to decrease very slightly through pools.

Turbidity - Generally increases May to June
Upper Pools generally darker color than lower pools.

Iron - Generally highest in upper pools.

Unit 2 Pools

Similar pattern as Unit 1 pools.

T-2 pool is exceptionally low in conductivity, alkalinity and hardness in all sampling periods.

C-3 Pool

~~Low~~

Fairly consistent for conductivity, alkalinity, and hardness, and color.

Marsh Creek

Limited data - low of conductivity, alkalinity in Sept 97 & M.

Unit 1 Pools Water Quality Conductivity

M-28

Holland Ditch

nr/144

May 96/98

Clark Ditch

nr/118

nr/171

Sept-Oct 95/97

nr/126

J Inlet

96/153

172/174

172/158

May 96/98

June-July 95/97

Sept-Oct 95/97

J

89/112

130/138

150/129

May 96/98

June-July 95/97

Sept-Oct 95/97

G

54/58

106/75

114/110

H

66/106

128/125

143/145

I

74/85

121/108

110/132

May 96/98

June-July 95/97

Sept-Oct 95/97

D

44/54

84/65

82/65

E

nr/84

111/91

115/105

F

69/81

119/104

121/116

May 96/98

June-July 95/97

Sept-Oct 95/97

C

62/76

132/101

126/109

May 96/98

June-July 95/97

Sept-Oct 95/97

B

53/69

101/81

106/84

May 96/98

June-July 95/97

Sept-Oct 95/97

A

54/72

116/91

102/92

May 96/98

June-July 95/97

Sept-Oct 95/97

nr = not run

Unit 1 Pools Water Quality Turbidity (FTU)

M-28

Holland Ditch

Clark Ditch

nr/21

May 96/98

nr/61

nr/22

Sept-Oct 95/97

nr/67

J Inlet

13/22

57/35

85/59

May 96/98

June-July 95/97

Sept-Oct 95/97

J

26/18

33/25

23/10

May 96/98

June-July 95/97

Sept-Oct 95/97

G

13/16

7.0/10

4.0/9

H

10.0/13

10.0/10.0

0/15

I

20/9

56/24

20/2

May 96/98

June-July 95/97

Sept-Oct 95/97

D

14/10

0.0/5

0.0/2

E

nr/6

6.0/10

2.0/0

F

19/8

52/19

22/1

May 96/98

June-July 95/97

Sept-Oct 95/97

C

16/17

6.0/18

0.0/1.0

May 96/98

June-July 95/97

Sept-Oct 95/97

B

12.0/8

9.0/7

5.0/2

May 96/98

June-July 95/97

Sept-Oct 95/97

A

13/11

10.0/7

27/2

May 96/98

June-July 95/97

Sept-Oct 95/97

nr = not run

Unit 2 Pools Water Quality Conductivity

Driggs River Diversion Ditch

nr/72/120

138/129

nr/132

May 95/97/98

June-July 95/97

Sept-Oct 95/97

A 2

62/62/72

88/86

100/92

May 95/96/98

June-July 95/97

Sept-Oct 95/97

C 2

63/48/55

78/67

93/69

May 95/96/98

June-July 95/97

Sept-Oct 95/97

M 2

54/42/42

72/59

69/62

May 95/96/97

June-July 95/97

Sept-Oct 95/97

T 2

35/19/28

44/24

33/41

May 95/96/98

June-July 95/97

Sept 95/97

nr = not run

Unit 2 Pools Water Quality pH

Driggs River Diversion Ditch

nr/7.9/7.4

7.7/7.0

nr/7.9

May 95/97/98
June-July 95/97
Sept-Oct 95/97

A 2

6.9/6.9/7.8

7.8/7.2

7.9/7.9

May 95/96/98
June-July 95/97
Sept-Oct 95/97

C 2

7.2/6.7/7.7

7.5/7.9

7.8/7.8

May 95/96/98
June-July 95/97
Sept-Oct 95/97

M 2

7.7/6.8/7.7

6.7/7.5

7.7/7.8

May 95/96/97
June-July 95/97
Sept-Oct 95/97

T 2

7.2/6.9/7.3

7.1/7.6

7.3/7.1

May 95/96/98
June-July 95/97
Sept 95/97

nr = not run

Unit 2 Pools Water Quality Turbidity(FTU)

Driggs River Diversion Ditch

nr/56/1
23/13
nr/15

May 95/97/98
June-July 95/97
Sept-Oct 95/97

A 2

nr/29/17
11.0/26
24/16

May 95/96/98
June-July 95/97
Sept-Oct 95/97

C 2

nr/22/11
14/16
0.0/9

May 95/96/98
June-July 95/97
Sept-Oct 95/97

M 2

nr/19/10
15/17
4.0/12

May 95/96/97
June-July 95/97
Sept-Oct 95/97

T 2

nr/21/17
6.0/22
10.0/21

May 95/96/98
June-July 95/97
Sept 95/97

nr = not run

Spur and Marsh Creek Pool Water Quality Conductivity

M 28	<u>Marsh Creek</u>	<u>Walsh Creek</u>	
	38/47	59/103	May 97/98
	157	144	Sept-Oct 97
		<u>C 3</u>	
	May /96/98	71/79	
	June 95/97	122/159	
	Sept 95/97	139/147	
		<u>North Big Spur</u>	
		127	May-98
		167	Jun-96
		106	Oct-96
		<u>Big Spur</u>	
		113	May-98
		166	Jun-96
		140	Oct-96
		<u>Upper S. Spur</u>	
		85	May-98
		121	Jun-96
		101	Oct-96
		<u>Lower S. Spur</u>	
		59	May-98
		66	Jun-96
		85	Oct-96
		<u>Marsh Creek Pool</u>	
		37	May-98
		61	Jun-96
		99	Oct-96

nr = not run

Spur and Marsh Creek Pool Water Quality pH

M 28 Marsh Creek Walsh Creek
 6.9/6.6 6.9/7.2

May 97/98

6.9 7.4

Sept-Oct 97

C 3
May 95/96/98 nr/6.9/7.6
June 95/97 8.2/6.9
Sept 95/97 8.1/8.4

North Big Spur

7.5
7.5
6.8

May-98
Jun-96
Oct-96

Big Spur

7.8
7.6
6.8

May-98
Jun-96
Oct-96

Upper S. Spur

7.8
7.5
7

May-98
Jun-96
Oct-96

Lower S. Spur

7.7
7.4
7

May-98
Jun-96
Oct-96

Marsh Creek Pool

7.2
7.1
6.9

May-98
Jun-96
Oct-96

nr = not run

Spur and Marsh Creek Pool Water Quality Turbidity (FTU)

M 28	<u>Marsh Creek</u>	<u>Walsh Creek</u>	
	17/5	17/22	May 97/98
	33	33	Sept-Oct 97
		<u>C 3</u>	
	May /96/98	21/6	
	June 95/97	17/14	
	Sept 95/97	8.0/0.0	
		<u>North Big Spur</u>	
		20	May-98
		63	Jun-96
		49	Oct-96
		<u>Big Spur</u>	
		25	May-98
		70	Jun-96
		45	Oct-96
		<u>Upper S. Spur</u>	
		3	May-98
		22	Jun-96
		8	Oct-96
		<u>Lower S. Spur</u>	
		13	May-98
		10	Jun-96
		7	Oct-96
	<u>Marsh Creek Pool</u>		
	17		May-98
	27		Jun-96
	42		Oct-96

nr = not run

Interim Water Quality Data May 15, 1998
Seney Wildlife Refuge

I was able to visit nearly all the pools during this trip including inlet streams at the M-28 bridges. A rough copy of the data is attached (and has been included in later summary pages). The results are similar to those of previous years for early spring with similar patterns of results from the north to south; i.e. a slight but consistent decline in ionic strength (conductivity), alkalinity, and hardness. Also the darkest color water tends to be in the northern most sample areas along with high iron and tannin levels. Flow levels appear much lower than previous early spring, as expected from low rainfall the year. Temperatures are also higher than expected at these sample points.

COMMENTS ON WATER QUALITY

Inlet Streams along M-28

Clark & Holland ditches appear to feed the Unit 1 pools, mostly from Holland as observed from flow. Also, samples from J-1 inlet are similar to Holland for conductivity and alkalinity. Water color from Clark ditch is noticeably darker than Holland and contains high iron and tannin levels which probably contributes to the relatively high iron deposits in the upper Unit 1 pools.

UNIT 1 POOLS

pH generally increases from May to August (6.7 - 7.1 in May 96 and 7.7 - 8.9 in August 96) No obvious pattern is observed through the pools.

Conductivity increased May to August (approximately double) and tends to decrease through the pools at each sampling point.

Alkalinity increases May to August (more than double) and tends to decrease very slightly through the pools.

Turbidity generally increased May to June with the upper pools darker the lower.

Iron is generally highest in the upper pools.

UNIT 2 POOLS

Similar pattern of results as Unit 1 pools. T -2 pool is exceptionally low in conductivity, alkalinity, and hardness in all sampling periods.

General comment- Total hardness was measured in most of the sites with results very similar to the alkalinity numbers. This is expected if all or most of the hardness is as carbonates; consistent with the few measurements of sulfate levels (results not reported as no calibration standards were available).

E. J. Collier
edited 6/27/00