PRIME WETLAND STUDY OF FITZWILLIAM – FINAL REPORT

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Ecosystem Management Consultants
Sandwich NH

Fitzwilliam Prime Wetland Study

1) *Identification & Mapping* √

2) *Classification* √

3) *Assessment of Functions & Values* √

4) *Conservation & Restoration Recommendations* √

Wetland Statistics to Start

Wetland Identification & Mapping

NWI

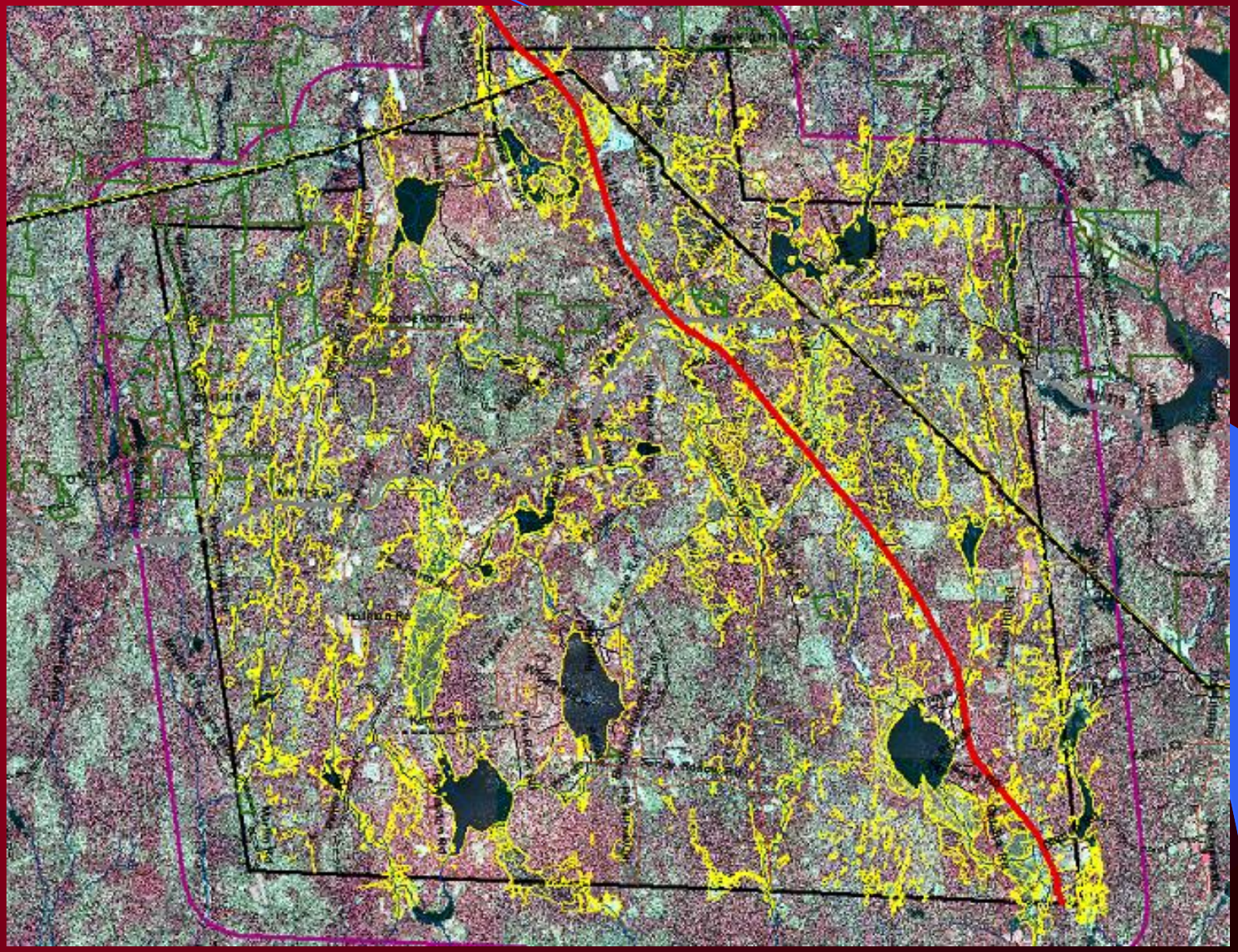
Total Acreage: 3714 acres
Number of map units: 565
Min. Size: .06 acres
Max. Size: 177.4 acres
Ave. Unit Size: 6.58 acres

HYDRIC SOILS

Total Acreage: 5721 acres
Amount of PD Soil: 1976 ac.
Amount of VPD Soil: 2911 ac.
Amount of WATER: 834 ac.
Ave. Unit Size: 17.7 acres

Fitzwilliam: 23060 acres

Fitzwilliam Wetlands – API



Wetland Statistics at End

Wetland Identification & Mapping

NWI

Total Acreage: 5004.8 acres
Number of map units: 5125
Min. Size: .0001 acres
Max. Size: 185.8 acres
Ave. Unit Size: .98 acres

HYDRIC SOILS

Total Acreage: 5004.8 acres
Amount of PD Soil: 1088 ac.
Amount of VPD Soil: 2707 ac.
Amount of WATER: 1119 ac.
Amount of Upland Islands: 91 ac. (N = 345)

Fitzwilliam: 23060 acres

Wetland Statistics - API

Wetland Identification & Mapping

Fitzwilliam: 23060 acres

Wetland Types

Lacustrine

L1 - N=9 (797.7 acres)

L2 - N=10 (4.15 acres)

Palustrine

PAB: N = 60 (77.58 ac.) mean = 1.29 ac.

PEM: N = 604 (591.9 ac.) mean = .98 ac.

PFO: N = 2693 (2092.2 ac.) mean = .77 ac.

PML: N = 5 (7.0 ac.) mean = 1.4 ac

PRB: N = 4 (.15 ac.) mean = .04 ac.

PSS: N = 846 (971.1 ac.) mean = 1.15 ac.

PUB: N = 138 (231.3 ac.) mean = 1.68 ac.

Riverine

R2: N = 103 (79.3 ac.) mean = .77 ac.

R3: N = 104 (45.9 ac.) mean = .44 ac.

R4: N = 36 (8.0 ac.) mean = .22 ac.

Wetland Statistics - API

Wetland Identification & Mapping

Artificial Wetlands

Bridges: N = 26 (.31 ac.)
Canal: N = 3 (.33 ac.)
Culverts: N = 84 (mapped, .28 ac.)
Dams: N = 3 (.04 ac.)
Ditches: N = 46 (3.05 ac.)
Roads: N = 2 (3.7 ac.)
Sluiceway: N = 1 (.002 ac.)
Spillway: N = 2 (.04 ac.)

Fitzwilliam: 23060 acres

Wetland Evaluation Units

- Based on the NH Method of determining discrete wetland assessment units
- All wetland units that are hydrologically connected are treated together, unless:
  - They narrow to less than 50 feet in width
  - Are crossed by a major road
  - Are otherwise blocked in part that prevents adequate continuance of wetland function

WEU Summary

- 114 units
- 3.45 ac. to 352.5 acres
- Smallest: Grant State Forest Marsh
- Largest: Sip Pond Peatland Complex
- Mean size: 39.6 acres
- Total acreage: 4510 ac. (98.6%)
- Non-WEU wetlands – < 3.5 acres: 494 ac.

WETLANDS of FITZWILLIAM

Showing Wetland Evaluation Units

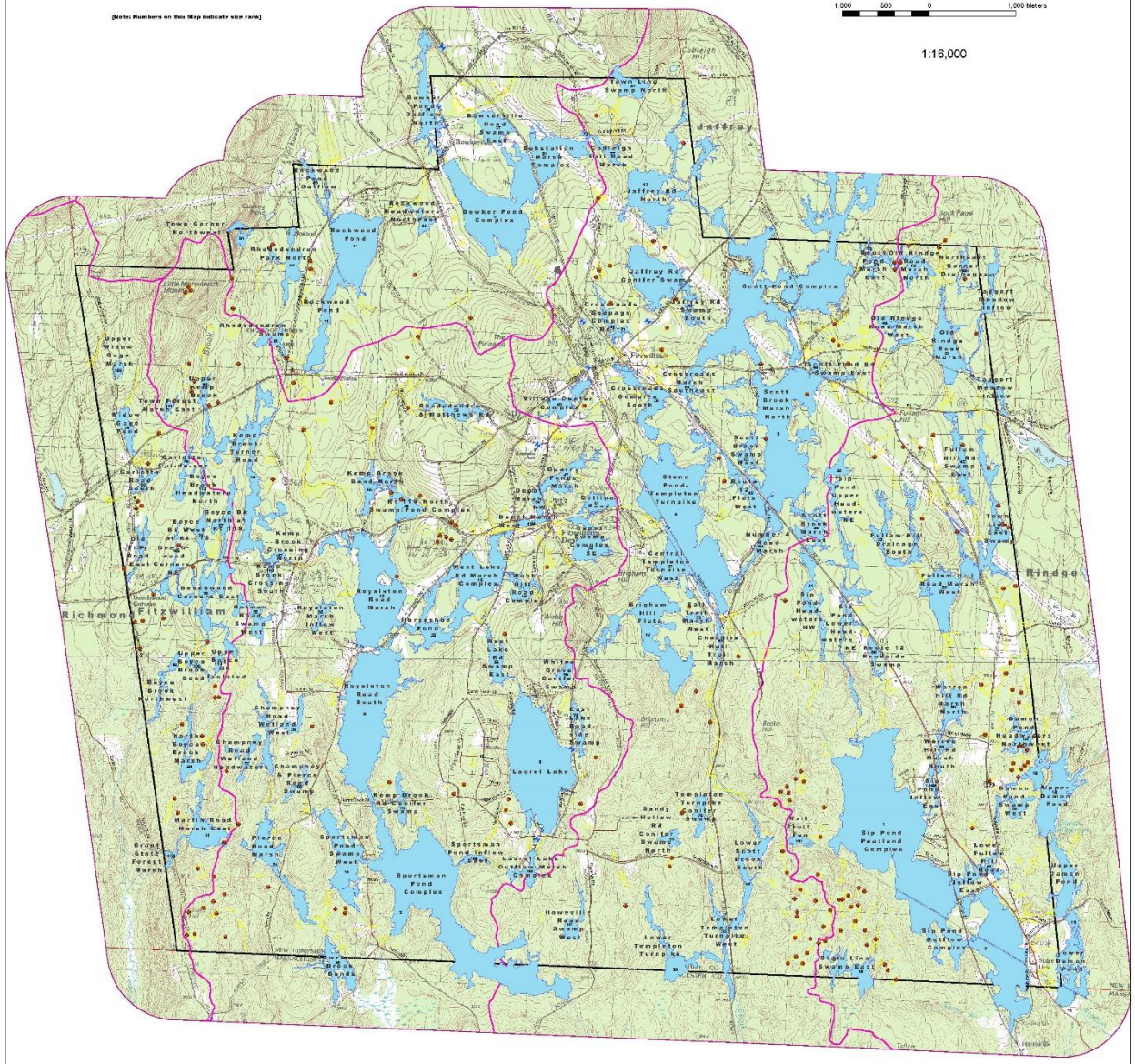
[Note: Numbers on this Map indicate size rank]

N
W E
S

1 0.5 0 1 Miles

1,000 500 0 1,000 Meters

1:16,000


Jaffrey
Richmond
Fitzwilliam
Rindge
Laurel Lake
Sportsman Pond Complex
Sip Pond Peatland Complex
Sip Pond Outflow Complex
Scott Road Complex
Rockwood Pond
Bowker Pond Complex
Stone Pond-Templeton Turnpike
Kemp Brook Beaver Marsh
Hoyleston Road Marsh
Hoyleston Road South
Sportsman Pond Inflow
Sportsman Pond Outflow Marsh Complex
Lower Templeton Turnpike
Lower Scott Brook Marsh
Howe Line Swamp East
Howe Line Swamp West
Lower Templeton Turnpike West
Sandy Hollow Rd Conifer Swamp North
Templeton Turnpike Conifer Swamp
Kemp Brook Alder-Conifer Swamp
Pierce Road Marsh
Martin Road Marsh East
Great State Forest Marsh
Champney Road Wetland West
Hoyleston Road Marsh Inflow West
Kemp Brook Beaver Marsh
Kemp Brook Beaver Marsh North
Kemp Brook Beaver Marsh South
Kemp Brook Beaver Marsh Inflow
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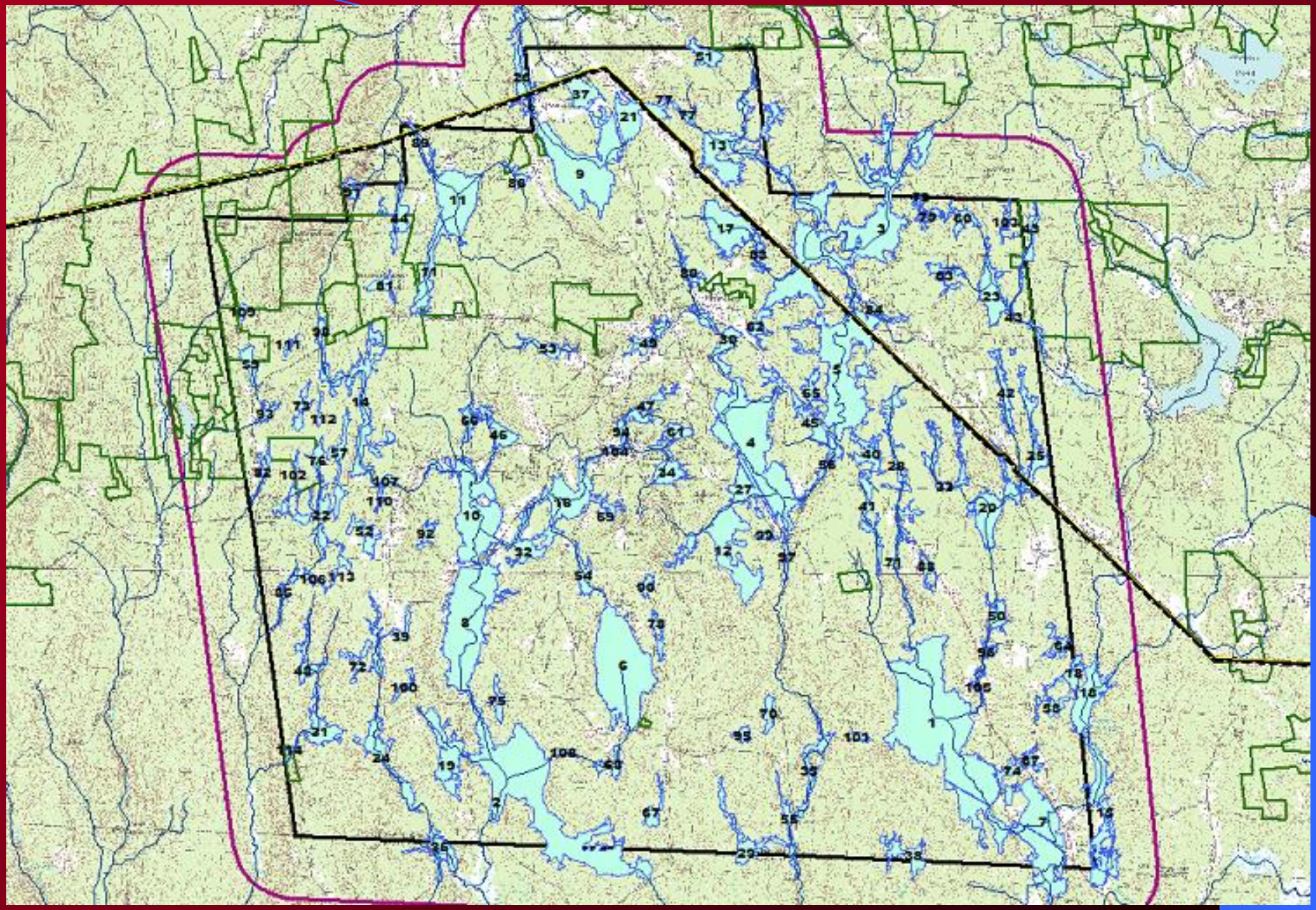
Wetlands Assessment – Point Ranking

- **Based on basic attributes of each wetland evaluation unit (WEU)**
- **Configured on actual, mapped cover classes and soil types**
- **Includes basic parameters at right:**

- # of NWI types
- # of soil types
- % hydric A soils
- % hydric B soils
- % open water
- % upland islands
- # of wetland type units
- Size



Wetlands Assessment – Point Ranking

- **Point Values 0 – 11 based on each attribute category, e.g. # 9)**
- Point Range: 0 – 4
- 0 – WEU lies outside of any protected area in town
- 1 – WEU lies partly within a private conservation area
- 2 – WEU lies partly within a public (i.e. town) conservation area
- 3 – WEU lies wholly within a private conservation area
- 4 – WEU lies wholly within a public (i.e. town) conservation area

1) Adjacent to water?
2) In active floodplain?
3) Overlying an aquifer?
4) Within unfragmented land block > 500 acres?
5) Within highest ranked WAP habitat type?
6) NWI cover class interspersion?
7) Presence of rare or endangered species of nat. communities?
8) Within significant ecological area?
9) Long-term sustainability?

Final NH Method Assessment of Functions & Values

1) Ecological Integrity
2) Wetland-dependent Wildlife Habitat
3) Fish & Aquatic Life Habitat
4) Scenic Quality
5) Educational Potential
6) Wetland-based Recreation
7) Flood Storage Potential
8) Groundwater Recharge
9) Sediment Trapping
10) Nutrient Transformation
11) Shoreline Anchoring
12) Noteworthiness

Wetland Project Final Steps

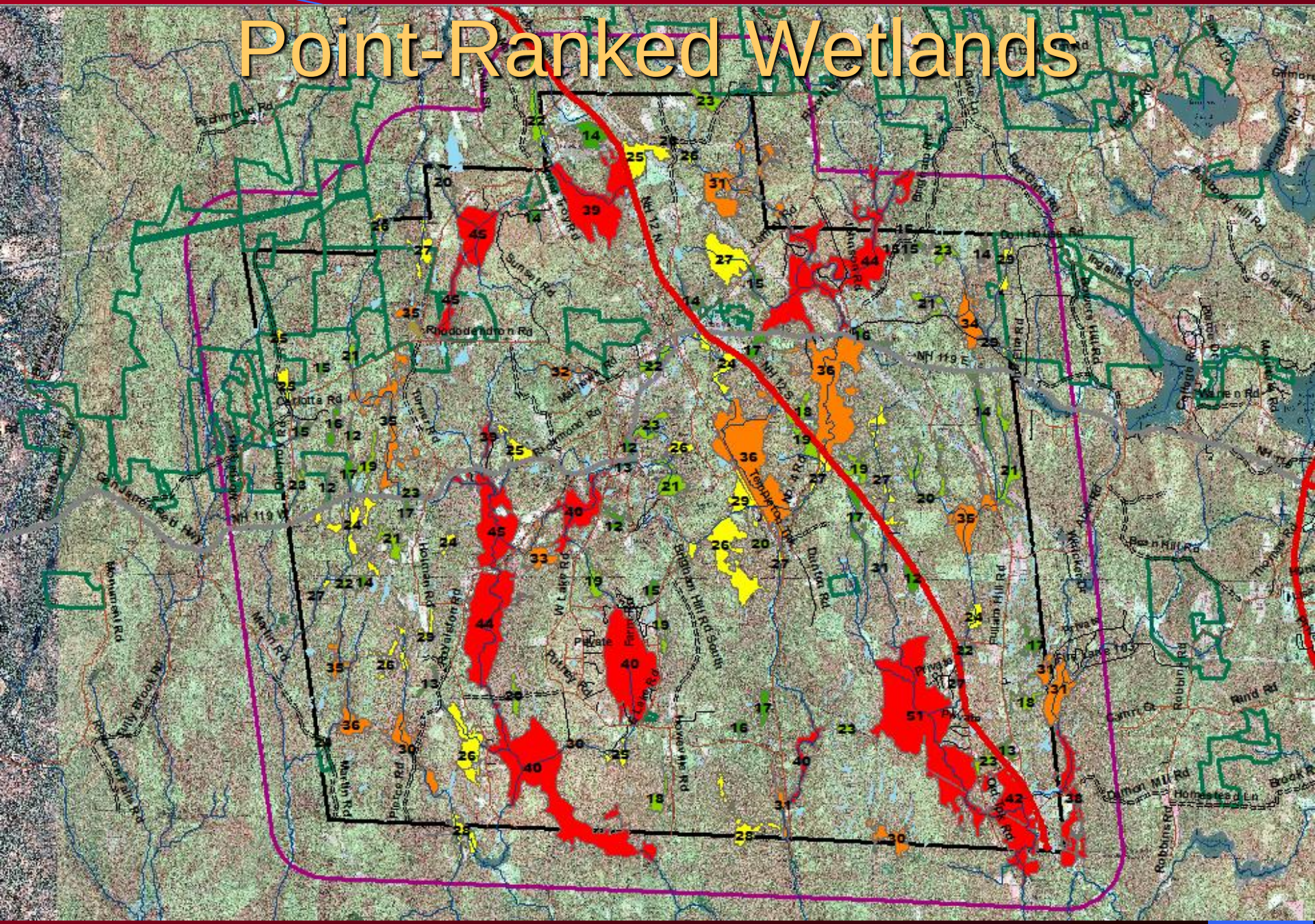
- **Applied points for Point Rank Assessment**
- **Selected "first cut" of 30 highest ranked wetlands for complete NH Method assessment**
- **Finalized list for NH Method evaluation (31)**
- **Submitted nominees for consideration as candidate prime wetlands**

Candidate Prime Wetlands

1) Sip Pond Peatland
2) Sportsman Pond
3) Scott Pond
4) Stone Pond-Templeton Turnpike
5) Scott Brook Marsh North
6) Laurel Lake
7) Royalston Rd South
8) Bowker Pond

1) Royalston Rd Marsh
2) Rockwood Pond
3) Jaffrey Road North
4) Fullam Hill Rd Marsh West
5) Old Rindge Rd Marsh
6) Pierce Rd Marsh
7) Martin Rd Marsh East
8) Norht Boyce Bk Marsh

Point-Ranked Wetlands


Richmond Rd
Sunset Rd
Rhododendron Rd
Carlotta Rd
Turner Rd
Holmes Rd
Royalston Rd
Martin Rd
Pierce Rd
Monument Rd
Silly Brook Rd
Rollinsford Rd
Richmond Rd
Marshall Rd
Pulsifer Rd
W Lake Rd
Brigham Hill Rd South
Tenpenny Rd
Dunton Rd
Pullen Hill Rd
Alfred Rd
Walker Rd
Bean Hill Rd
Thomas Rd
Robbins Rd
Rand Rd
Cemetery Rd
Dalton Mill Rd
Homestead Ln
Book Rd
Old Jaffrey Rd
Gilmore Rd
Jacquith Rd
Ingalls Rd
Collins Hill Rd
Old Coach Rd
Hancock Hill Rd
Wilder Rd
Warren Rd
Gilmore Rd
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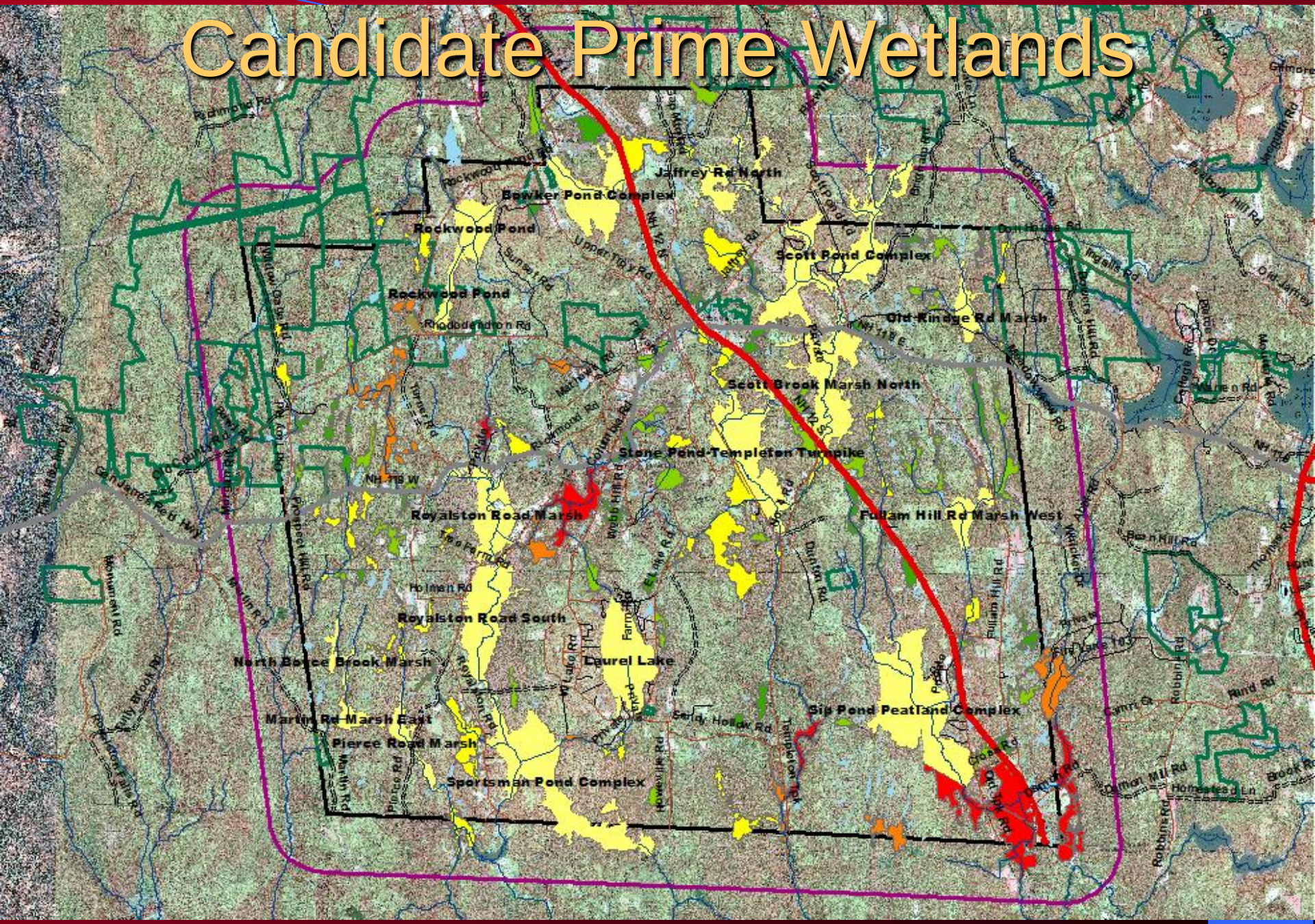
Private

Candidate Prime Wetlands



Some Common Features

- Open water, usually ponded
- Perennial stream associated with wetland
- Exceptional wildlife habitat (WAP 1 or 2)
- High visual quality
- Above average water quality enhancement
- Noteworthy features, esp. vernal pools nearby

NH Method Results

NH Method Summary of Scores

Town: FITZWILLIAM

Add qualitative information to rows 6 through 9

Do not add data to Scores columns - Functional Scores are automatically recorded from data sheets for each wetland

Wetland name/code	MEAN VALUES	Sip Pond Peatland Complex	Sportsman Pond Complex	Scott Pond Complex	Stone Pond-Templeton Turnpike	Scott Brook Marsh North	Laurel Lake	Sip Pond Outflow Complex	Royalston Road South	Bowker Pond Complex	Royalston Road Marsh	Rockwood Pond
Date Evaluated		*8/24/2016*	*9/29/2016*	*1/7/2016*	*9/29/2016*	*1/7/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*
Investigator	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll
Wetland Acres	98.4	352.5	300.2	299.5	214.5	193.2	192.5	189.2	183.9	161.3	134.9	121.1
Watershed Acres	2454.0	3495	7141	4074	6654	4709	654	11804	4662	842	3975	981
Wetland Functions & Scores		= Highest Scores			= 2nd highest scores			= 3rd highest scores				
1. ECOLOGICAL INTEGRITY	7.5	7.6	8.1	8.1	6.5	7.9	5.5	5.2	7.1	5.6	7.2	6.2
2. WETLAND WILDLIFE HABITAT	7.3	8.5	9.3	9.3	7.6	8.5	7.1	7.5	7.3	7.7	7.8	8.1
3. FISH & AQUATIC HABITAT	5.5	7.3	6.5	7.0	5.8	7.1	5.0	6.6	6.2	4.8	5.5	5.4
4. SCENIC QUALITY	6.6	9.6	9.6	9.6	8.3	6.8	7.5	8.3	6.7	8.3	6.7	8.3
5. EDUCATIONAL POTENTIAL	6.4	7.3	8.2	9.3	7.6	5.8	7.8	7.5	5.9	7.9	6.9	7.6
6. WETLAND-BASED RECREATION	6.1	9.7	9.8	8.3	7.0	6.9	7.6	8.5	5.8	7.0	5.9	9.4
7. FLOODWATER STORAGE	5.2	8.0	7.1	4.3	4.1	8.0	10.0	4.5	5.4	8.0	5.0	8.0
8. GROUNDWATER	2.7	2.8	3.6	4.6	3.6	5.4	4.4	0.0	5.4	5.4	7.2	4.4
9. SEDIMENT TRAPPING	7.1	7.9	6.5	6.3	7.7	8.6	7.4	0.0	8.6	7.7	8.6	7.1
10. NUTRIENT TRANSFORMATION	6.2	6.2	4.9	5.1	6.9	8.3	5.2	0.0	7.3	5.3	7.2	4.4
11. SHORELINE ANCHORING	6.9	8.8	7.5	7.5	8.1	6.5	4.9	0.0	7.5	7.5	8.8	6.3
12. NOTEWORTHINESS	13.5	40.0	20.0	20.0	10.0	20.0	20.0	0.0	10.0	10.0	10.0	20.0
	Top Ranked	3	3	3		1	1				1	
	2nd Ranked	2	1		1	3		1	1	3		2
	3rd Ranked	2	2	2		3	1		1	1	2	2
	# > Mean	12	10	9	9	10	7	5	8	8	8	8
	SUM	19	16	14	10	17	9	6	10	12	11	12
	Mean Sum =	8.77										

NH Method Results

Jaffrey Rd Conifer Swamp	Fullam Hill Rd Marsh West	Old Rindge Rd Marsh	Pierce Road Marsh	Town Line East Swamp	Martin Road Marsh East	Horseshoe Pond	Lower Scott Brook South	State Line Swamp East	North Boyce Brook Marsh	Rhododendron & Matthews Rd	Lower Templeton Turnpike	Kemp Brook Bend North	Sip Pond Lower Head-waters NE	Rhododendron Swamp	Sportsman Pond Inflow East	Grant State Forest Marsh
10/12/2016	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*	*10/12/2016*
R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll	R. Van de Poll
67.2	55.3	44.7	42.3	40.7	29.3	30.8	28.5	26.3	19.4	17.3	17.0	12.8	11.4	9.4	4.4	3.5
261	1001	531	632	443	288	1406	7789	106	144	206	8824	817	379	92	871	343
		= Highest Scores			= 2nd highest scores			= 3rd highest scores								
5.7	**7.9**	7.1	**9.8**	6.2	**10.0**	5.8	7.2	**10.0**	**10.0**	**8.3**	**7.6**	7.4	4.8	**8.8**	**9.0**	**9.5**
5.7	**7.3**	6.7	**8.7**	5.8	**8.5**	5.8	**7.3**	**7.7**	**8.1**	6.3	6.4	6.1	5.6	5.4	6.6	**7.7**
3.1	**7.0**	4.1	**6.7**	3.5	**6.5**	4.0	**6.2**	3.5	**5.6**	**6.1**	**5.7**	**5.6**	4.4	3.5	5.0	**6.3**
3.2	6.0	**7.7**	**7.1**	3.8	**8.3**	5.2	**6.7**	5.3	**7.7**	6.2	6.0	6.0	5.2	6.0	6.2	**6.8**
5.5	**7.0**	6.3	**7.0**	6.0	6.2	4.6	**6.9**	4.4	5.9	4.9	**6.7**	5.2	5.5	**6.5**	5.4	**6.5**
4.1	**6.5**	**6.1**	**7.6**	4.4	5.6	4.7	6.0	3.3	5.5	3.2	**6.4**	4.2	4.5	**6.1**	3.3	**6.7**
5.0	**5.2**	**5.7**	5.0	5.1	5.1	4.0	3.1	4.1	**5.3**	4.7	2.5	3.0	3.0	3.3	1.8	1.9
1.0	1.0	1.0	1.0	1.0	1.0	**5.4**	1.0	1.0	1.0	1.0	**2.8**	**7.2**	1.0	2.6	1.0	1.0
8.6	**7.9**	**8.0**	5.0	**7.2**	**7.2**	**7.7**	4.3	**9.2**	**7.2**	**7.8**	4.4	6.9	7.0	**9.0**	5.4	6.3
7.7	**7.1**	**7.7**	5.0	**6.4**	**7.4**	**6.3**	5.0	**7.7**	5.5	**7.5**	4.4	5.5	**7.0**	**7.5**	4.9	4.6
0.0	**7.5**	**8.8**	**8.8**	**7.5**	**8.1**	**7.5**	**8.8**	0.0	**8.8**	**8.8**	**7.5**	**9.4**	6.3	0.0	**8.8**	6.3
10.0	10.0	**20.0**	10.0	10.0	**20.0**	0.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	**30.0**	10.0	10.0
					1			2	1			1				
			1		1	1						1		2		
1	1	3	1		2		1		2	1					1	1
2	9	7	7	3	8	4	5	4	7	5	6	3	1	5	2	6
3	**10**	**10**	**9**	**3**	**12**	**5**	**6**	**6**	**10**	**6**	**6**	**5**	**1**	**7**	**3**	**7**

Sip Pond Peatland Complex

Sportsman Pond Complex

Scott Pond Complex

Stone Pond- Templeton Turnpike

Scott Brook Marsh North

Royalston Road South

Bowker Pond Complex

Royalston Road Marsh

Rockwood Pond

Jaffrey Road North

Fullam Hill Rd Marsh West

Old Rindge Road Marsh

Pierce Road Marsh

Martin Road Marsh East

North Boyce Brook Marsh

Were it not for the wonders of wetlands...
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