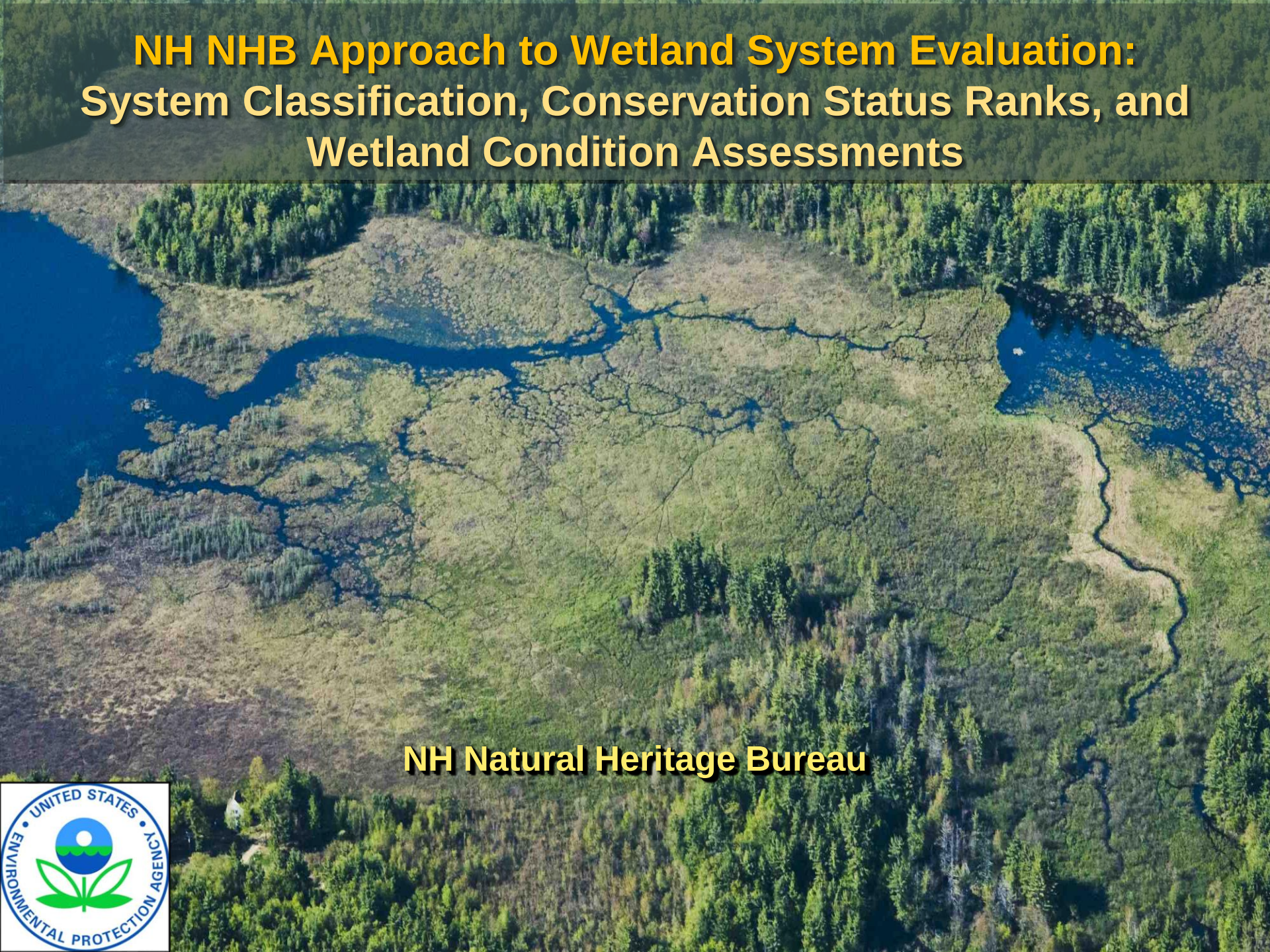
NH NHB Approach to Wetland System Evaluation: System Classification, Conservation Status Ranks, and Wetland Condition Assessments



NH Natural Heritage Bureau

NH Natural Heritage Bureau (NHB)

Mission mandated by the NH Native Plant Protection Act (1987) RSA 217-A:

- Develop and recommend measures for the protection, conservation, enhancement, and management of NH's native plant species and exemplary natural communities.
- Help to protect NH's biodiversity by analyzing data on the status, location, and distribution of rare or declining native plant species and natural communities.

What is it?
Where is it?
How is it doing?
What can we do to help?

Small whorled pogonia (*Isotria medeoloides*)

NH Natural Heritage Bureau (NHB)

Approach to Wetland System Evaluation

1. NHB's natural community and system classification
2. EIA approach in evaluating wetland system condition (A to D)
3. Wetland system EIA rank specs that guide condition assessments
4. FQA and development of FQA wetland system thresholds
5. Development of a Rapid FQA method
6. Calculating wetland system conservation status ranks (S1 to S5)
7. How all these elements work together in determining wetland system exemplary thresholds

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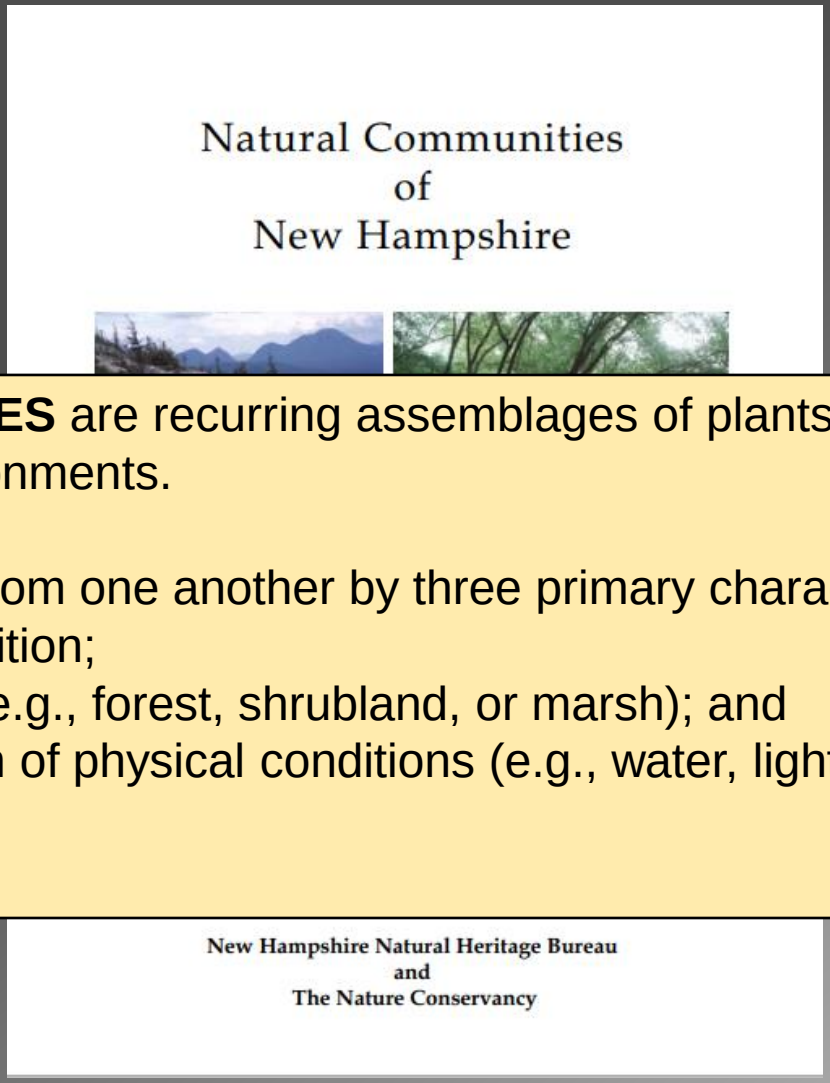
NHB Classified over 200 Natural Communities in NH

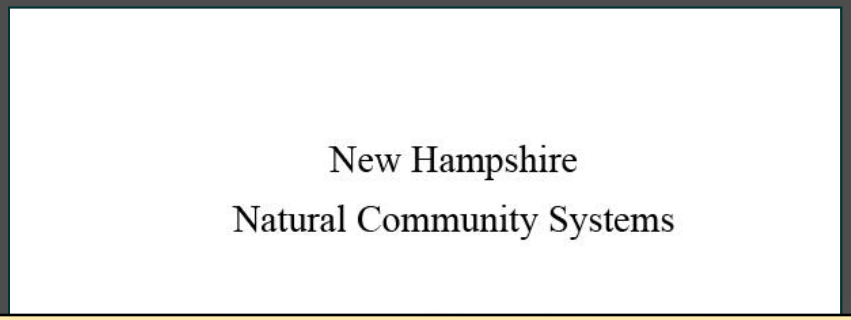


NATURAL COMMUNITIES are recurring assemblages of plants and animals found in particular physical environments.

They are distinguished from one another by three primary characteristics:

- plant species composition;
- vegetation structure (e.g., forest, shrubland, or marsh); and
- a specific combination of physical conditions (e.g., water, light, nutrient levels, and climate).

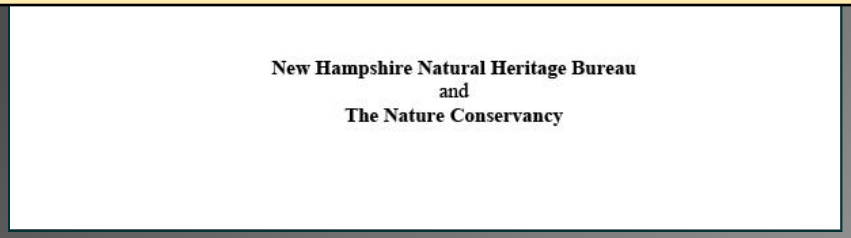
NHB Classified 45 Systems in NH


New Hampshire
Natural Community Systems

- **18 Upland**
- **27 Wetland**

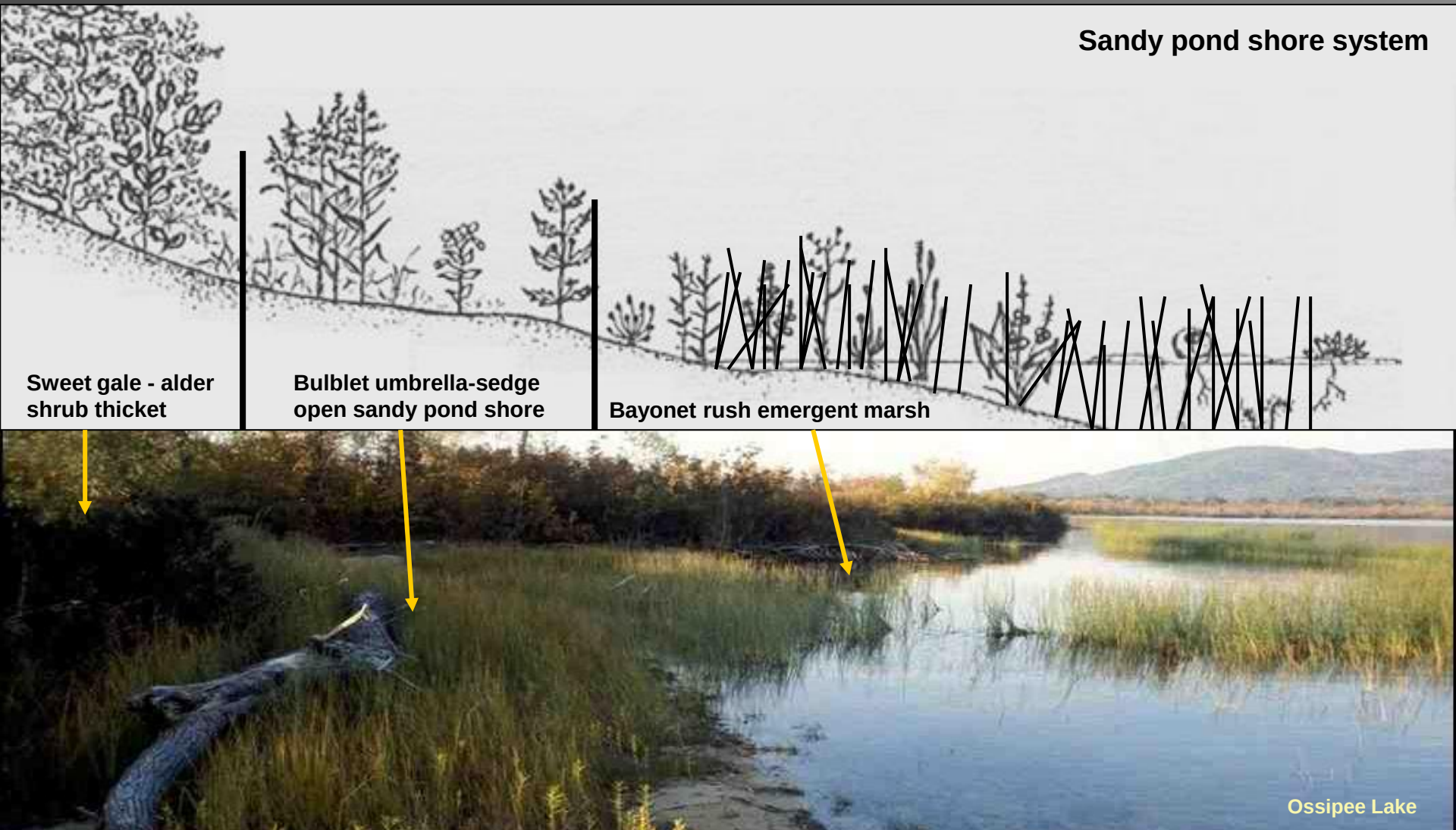
SYSTEMS are recurring assemblages of natural communities linked by a common set of characteristics associated with:

- climate
- landforms
- disturbance
- nutrients
- soils
- bedrock
- hydrology


New Hampshire Natural Heritage Bureau
and
The Nature Conservancy

Natural Community and System Examples

Ground View



Natural Community and System Examples

Aerial View

Patterned fen system

- Liverwort - horned bladderwort fen

Black spruce peat swamp system

- Black spruce swamp
- Larch - mixed conifer swamp
- Mountain holly - black spruce wooded fen
- Alder wooded fen

Lowland spruce - fir forest/swamp system

- Lowland spruce - fir forest
- Red spruce swamp
- Cobble - sand river channel
- Aquatic bed
- Sugar maple - beech - yellow birch forest

South Bay Bog
Pittsburg, NH

¼ mile

Value of NH NHB Systems

- **Understandable to a broad audience**

  Compared to natural communities…

  - *far fewer system types*
  - *system types easier to understand*

Wetland System Key

SIMPLIFIED KEY TO WETLAND SYSTEMS

1a. Saline systems
  2a. Vascular plant cover moderate to high
    3a. Supratidal; isolated brackish basin marshes (regularly receive fresh water plus salt water during severe storms from overwash or berm infiltration)…… **Coastal salt pond marsh system**
    3b. Intertidal; marshes with regular tidal flooding
      4a. Marshes with moderate to high salinities (18-50 ppt) ……..……..……..…. **Salt marsh system**
      4b. Marshes with lower salinities (0.5-18 ppt)…… **Brackish riverbank marsh system**
  2b. Sparsely vegetated to unvegetated
    5a. Intertidal……..…….. **Sparsely vegetated intertidal system**
    5b. Subtidal……..…….. **Subtidal system**
1b. Freshwater systems

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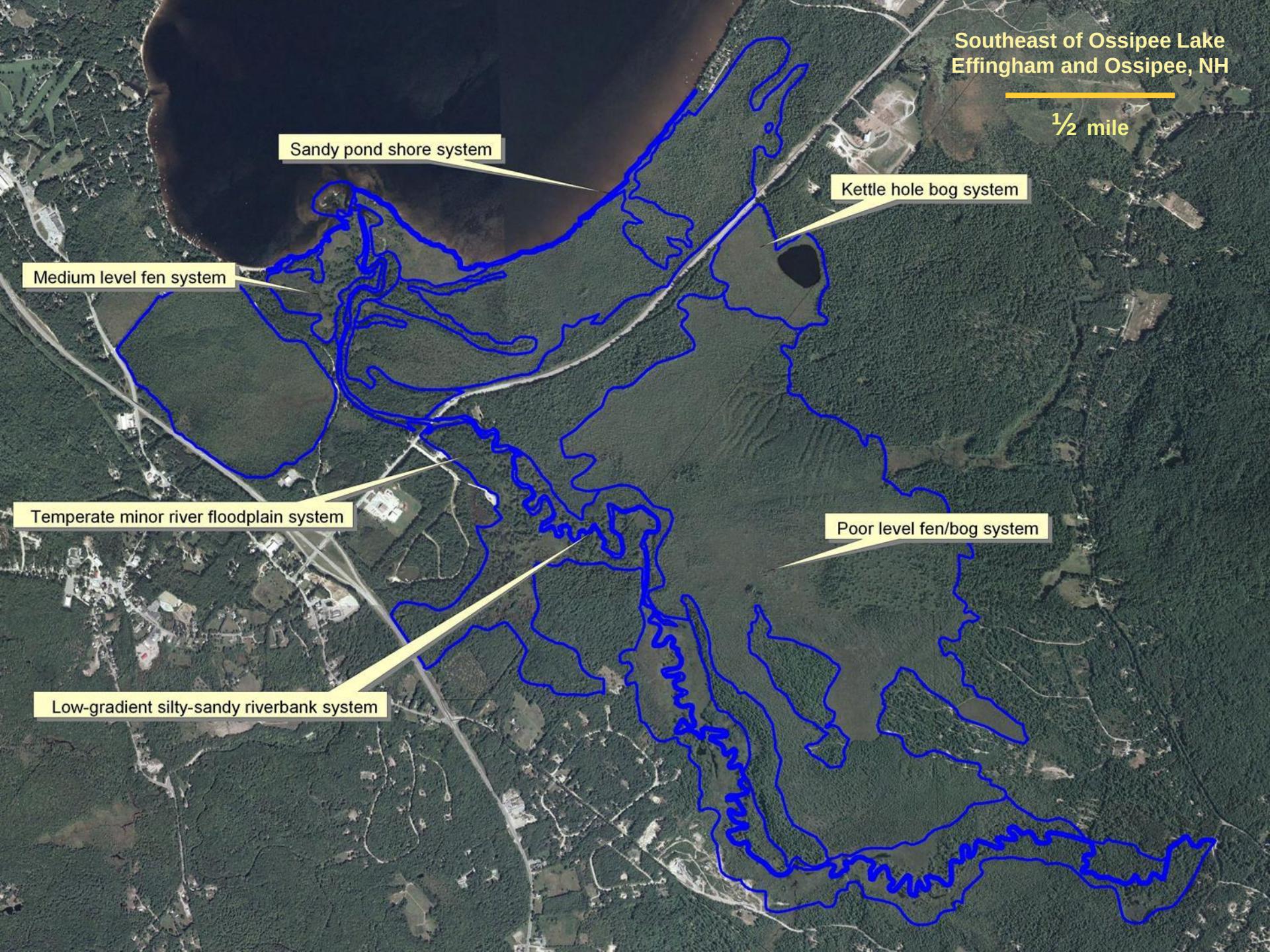
1b. Freshwater systems

…… **Coastal conifer peat swamp system**
16b. Peat swamps in c. and n. NH; dominated by black spruce (eastern larch and red spruce occasional to locally abundant)…… **Black spruce peat swamp system**
13b. Open peatlands (trees cover <25%)
17a. Peatlands usually above 2,500'
18a. Nutrient-poor peatlands in subalpine and alpine areas…. **Alpine/subalpine bog system**
18b. Weakly enriched sloping fens in montane settings …. **Montane sloping fen system**
17b. Peatlands usually below 2,500'
19a. Peatlands patterned; only in extreme n. NH…… **Patterned fen system**
19b. Peatlands not patterned
20a. Nutrient-rich peatlands
21a. Weakly to moderately enriched peatlands…… **Medium level fen system**
21b. Strongly enriched peatlands; only in n. NH…..**Calcareous sloping fen system**
20b. Nutrient-poor peatlands
22a. Peatlands in kettle holes, usually lack significant inlet or outlet stream; *Cladopodiella fluitans* mud bottoms usually present …… **Kettle hole bog system**
22b. Peatlands usually with inlet or outlet stream; mud bottoms usually not present …… **Poor level fen/bog system**
12b. Wetlands on mineral or muck soils (fibrous peat absent or <16" deep); hummocks and hollows usually poorly developed; *Sphagnum* mosses if present, generally not abundant; sedges and heath shrubs usually less abundant than grasses and forbs
23a. Open nutrient-poor wetlands in sand plain settings along lake/pond shores or closed basins with widely fluctuating water levels
24a. Wetlands on sandy shores…… **Sandy pond shore system**
24b. Wetlands in shallow, closed basins with widely fluctuating water levels…… **Sand plain basin marsh system**
23b. Nutrient-rich wetlands (forest, shrubland, or herbaceous)
25a. Open wetlands…… **Drainage marsh - shrub swamp system**
25b. Forested swamps
26a. Small (<5 ac) forested wetlands at slope bases or along drainages; characterized by seepage …… **Forest seep/seepage forest system**
26b. Larger forested wetlands, not characterized by seepage
27a. Mosaic of wetland and upland softwood forest; mostly n. of White Mts …… **Lowland spruce - fir forest/swamp system**
27b. Primarily hardwood swamps…… **Temperate minerotrophic swamp system**

Value of NH NHB Systems

- Understandable to a broad audience
- Useful scale for mapping


Southeast of Ossipee Lake
Effingham and Ossipee, NH
½ mile
Sandy pond shore system
Kettle hole bog system
Medium level fen system
Temperate minor river floodplain system
Poor level fen/bog system
Low-gradient silty-sandy riverbank system

Value of NH NHB Systems

- **Understandable to a broad audience**
- **Useful scale for mapping**
- **Serve as coarse-filters:**
  By conserving (and managing where needed) an adequate number of viable examples of each system type, we can protect the majority of NH's species

Pitch pine sand plain system

Concord Pine Barrens

Requiring *fine-filter*
Karner Blue Butterfly
(*Lycaeides melissa samuelis*); FE, SE

Wild lupine
(*Lupinus perennis*)
ST

Value of NH NHB Systems

- Understandable to a broad audience
- Useful scale for mapping
- Serve as coarse-filters
- Compatibility with NatureServe's Ecological Systems & NVC Groups

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Value of NH NHB Systems

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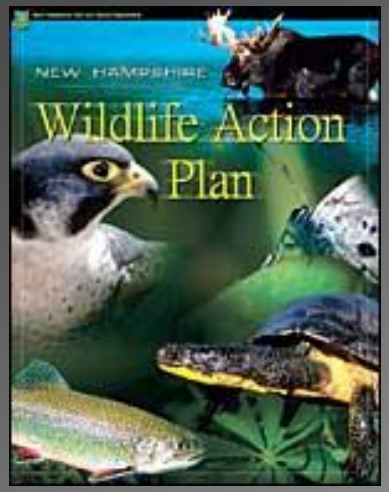
- Modeling/predicting wildlife habitat and for ongoing WAP development



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- Determining conservation status ranks (global and state ranks)
- Informing conservation planning through more objective site comparisons (using conservation status ranks and condition assessment scores)
- Importance to Ecological Integrity Assessments (L2 condition assessment)
  - *Systems provide a practical scale for wetland EIA evaluations*
  - *EIA utilizes diagnostic indicators of condition specific to each system type,…*
    - *…providing descriptions of expected vegetation composition and structure and physical conditions*

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  - *Systems provide a practical scale for wetland EIA evaluations*
  - *EIA utilizes diagnostic indicators of condition specific to each system type*
  - *Utilizing these system specific diagnostic indicators…*
    - *…reduces variability of scores within wetland types*
    - *…improves ability to differentiate integrity over a range of wetland conditions*
    - *…improves our understanding of how the susceptibility of different wetland system types to particular stressors may differ*

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EIA Method Measures…

Degree to which, under current conditions, a wetland system…

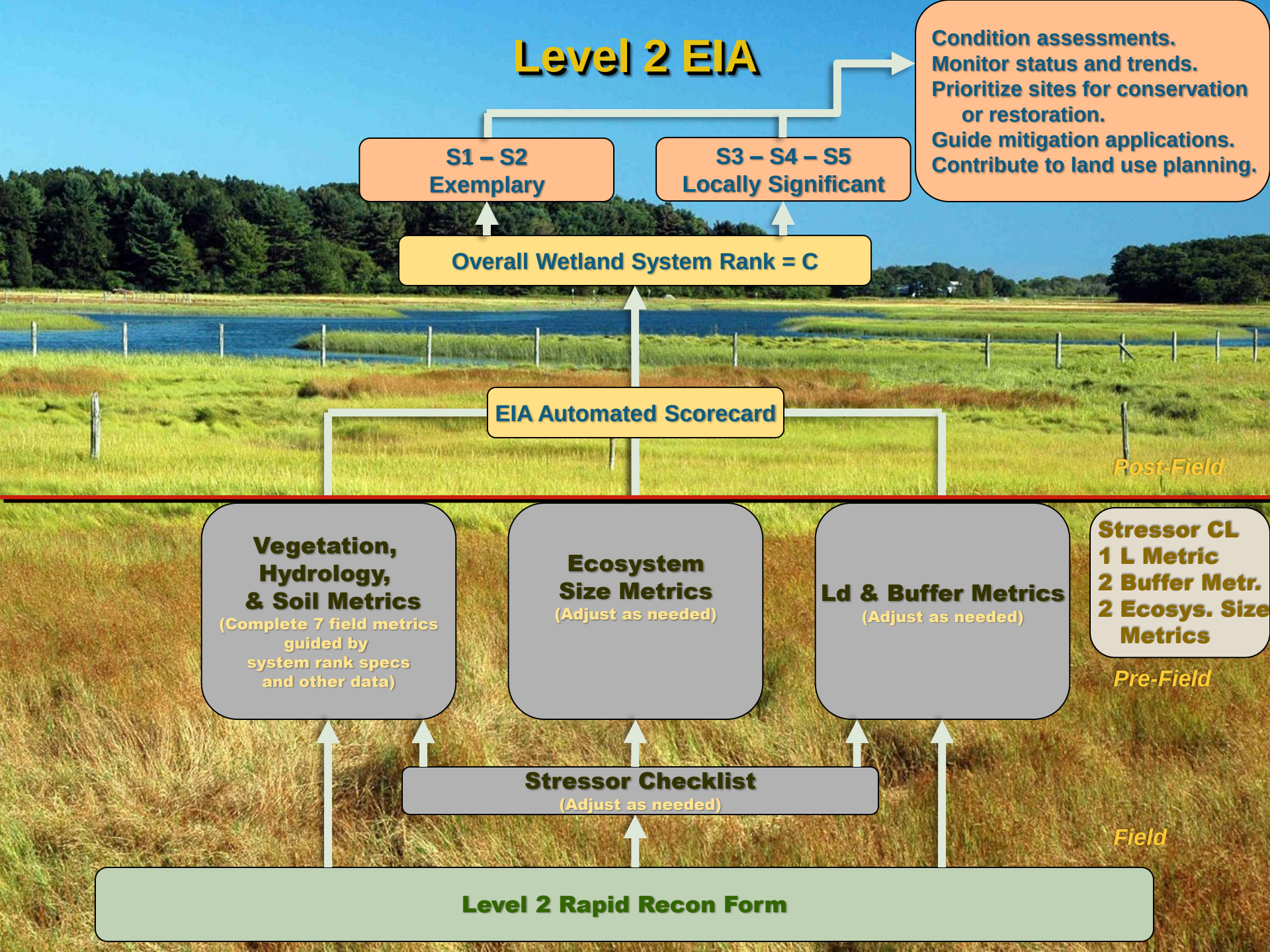
- matches reference conditions for structure, composition, processes, and connectivity and
- is operating within the bounds of natural disturbance regimes

EIA facilitates wetland conservation, regulation, and mitigation by improved understanding of wetland condition

Primary Rank Factors	Major Ecological Factors	Metrics	Stressors	System Rank Spec
		Pre-Field Assessment		
Landscape Context	Landscape	Land Use Index		
	Buffer	Perimeter with Natural Buffer Width of Natural Buffer		
Size	Ecosystem Size	Comparative Size Change in Size		✓
	——		Stressor Checklist	✓
		Field Assessment		
Condition	Vegetation	Vegetation Structure		✓
		Invasive Nonnative Plant Species Cover		✓
		Native Plant Species Composition		✓
	Hydrology	Water Source		✓
		Hydroperiod		✓
		Hydrologic Connectivity		
	Soil	Soil/Substrate		✓

"A" rank criteria for each metric on the Metric Form are a guide to reference condition characteristics

VEGETATION STRUCTURE ***SEE WETLAND SYSTEM RANK SPEC*** **[vertical layers and horizontal patches]**	
FORESTED FLOODPLAIN & SWAMP	
Canopy a mosaic of small patches of different ages or sizes, including old trees and canopy gaps containing regeneration, AND stems of medium (e.g., 30–50 cm / 12-20" dbh) and large size (e.g., >50 cm / >20" dbh) within expected range.* There exists a very wide size-class diversity of downed logs and standing snags. No human-related degradation to vegetation structure evident.	**A**
Canopy largely heterogeneous in age or size, but with some gaps containing regeneration or some variation in tree sizes, AND number of live stems of medium and large size within or very near expected range. Wide size-class diversity of downed logs and standing snags. Characteristic woody species regenerating but present in somewhat lower abundance and/or diversity than expected due to human-related factors. Slight degradation to vegetation structure evident (e.g., low levels of cutting, browsing, and/or grazing).	**B**
Canopy somewhat homogeneous in age or size, AND number of live stems of medium and large size below but moderately near expected range. Moderate size-class diversity of downed logs and standing snags. Characteristic woody species with noticeably reduced regeneration, abundance, and/or diversity than expected due to human-related factors. Moderate degradation to vegetation structure evident (e.g., intermediate levels of cutting, browsing, and/or grazing).	**C**
Canopy very homogeneous, in size or age OR number of live stems of medium and large size well below expected range. Low size-class diversity of downed logs and standing snags (or absent). Characteristic woody species with severely reduced regeneration, abundance, or diversity than expected due to human-related factors. Substantial degradation to vegetation structure evident (e.g., high levels of cutting, browsing, or grazing).	**D**
** Acidic conifer swamps may typically have smaller average stem sizes than hardwood swamps* Explain rank if B, C, or D:	


Level 2 EIA
Condition assessments.
Monitor status and trends.
Prioritize sites for conservation or restoration.
Guide mitigation applications.
Contribute to land use planning.
S1 – S2
Exemplary
S3 – S4 – S5
Locally Significant
Overall Wetland System Rank = C
EIA Automated Scorecard
Post-Field
Vegetation, Hydrology, & Soil Metrics
(Complete 7 field metrics guided by system rank specs and other data)
Ecosystem Size Metrics
(Adjust as needed)
Ld & Buffer Metrics
(Adjust as needed)
Stressor CL
1 L Metric
2 Buffer Metr.
2 Ecosys. Size Metrics
Pre-Field
Stressor Checklist
(Adjust as needed)
Field
Level 2 Rapid Recon Form

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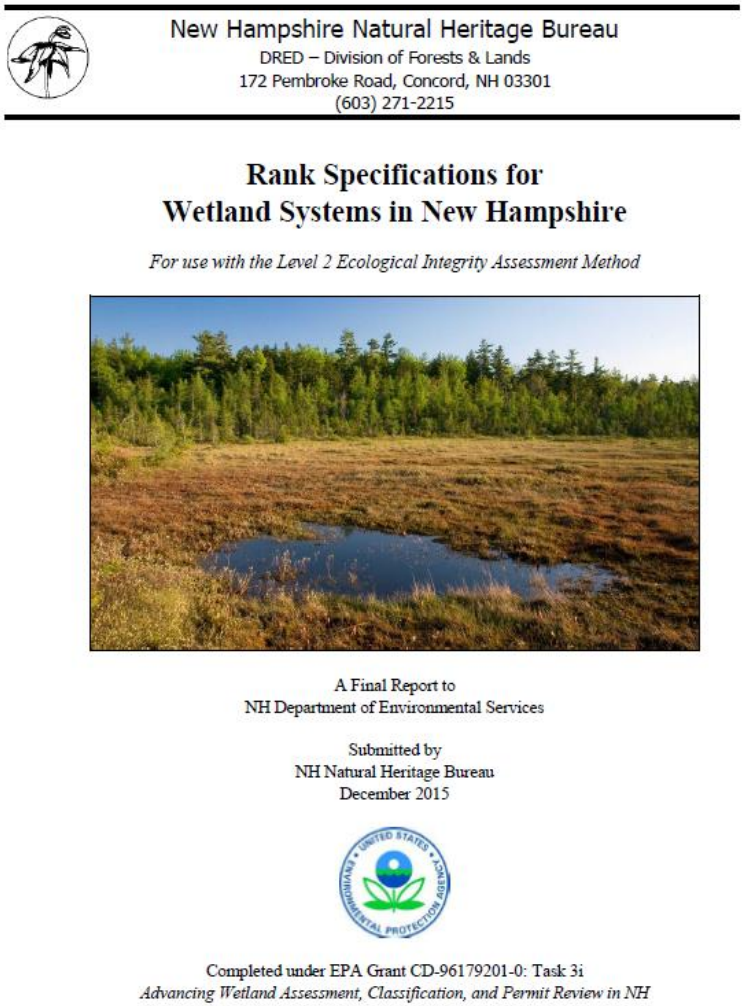
EIA Wetland System Rank Specs

Along with the "A" rank criteria for each metric on the Metric Form,

- wetland system rank specs are also a guide to reference condition characteristics

These rank specs also provide accessible locations of reference condition examples for on-the-ground comparisons



New Hampshire Natural Heritage Bureau
DRED – Division of Forests & Lands
172 Pembroke Road, Concord, NH 03301
(603) 271-2215

Rank Specifications for Wetland Systems in New Hampshire

For use with the Level 2 Ecological Integrity Assessment Method

A Final Report to
NH Department of Environmental Services

Submitted by
NH Natural Heritage Bureau
December 2015

Completed under EPA Grant CD-96179201-0: Task 3i
Advancing Wetland Assessment, Classification, and Permit Review in NH

Wetland System Rank Specs

TEMPERATE PEAT SWAMP SYSTEM (S3S4)

Landscape Settings: contact deposits or la

Distribution: Found

NatureServe Ecolog

Soil/Substrate: Deep system, is usually a p layer <40 cm) where the entire swamp bas

Nutrient Status and levels can be higher

Spatial Pattern: Sm in mosaics with more

Comparative Size: A

Vegetation Structure

Red maple - Sphagn common as part of th peatland system. The or *red maple - red oa*

Diagnostic natura
Black gum - red m
Highbush blueber
Highbush blueber
Red maple - Sphag
Swamp white oak
Winterberry - cinn

Associated system association with co encompass a broad

Invasive Nonnative P

Berberis thunberg
Frangula alnus (gl
Lythrum salicaria

Native Plant Species dominated by *Acer r* common but minor a shrub layer is well de winterberry). An abu characteristic. It is ch (although sometimes fern), *Toxicodendron radicans* (poison-ivy), *Lindera benzoin* (northern spicebush), and *Fraxinus nigra* (black ash). More southern or low elevation examples are more likely to contain species restricted to coastal or southern parts of the state. Rare (endangered and threatened) species are noted by an asterisk (*).

Vegetation Structure (vertical & horizontal): Forest to woodland with tall shrub patches.

Red maple - Sphagnum basin swamp is the typical community found in this system. Patches of tall shrub fens (<25% tree cover) are common as part of the swamp mosaic; where these tall shrub fens become extensive, they may be considered part of an adjacent open peatland system. The transition to upland forests in this swamp system is often marked by a border of ***hemlock - cinnamon fern forest*** or ***red maple - red oak - cinnamon fern forest***.

Diagnostic natural communities:

Black gum - red maple basin swamp (S3)
Highbush blueberry - mountain holly wooded fen (S3S4)
Highbush blueberry - winterberry shrub thicket (S4)
Red maple - Sphagnum basin swamp (S4)
Swamp white oak basin swamp (S1)
Winterberry - cinnamon fern wooded fen (S4)

Peripheral or occasional natural communities:

Hemlock - cinnamon fern forest (S4)
Red maple - pitch pine - cinnamon fern forest (S1S2)
Red maple - red oak - cinnamon fern forest (S3S4)
Red maple - sensitive fern swamp (S3S4)
Red spruce swamp (S3)
Seasonally flooded red maple swamp (S4S5)

Associated systems: This swamp system may be found around some poor level fen/bog and kettle hole bog systems, and in association with coastal conifer peat or temperate minerotrophic swamp systems, particularly in larger swamp systems that encompass a broad range of wetland conditions. This system transitions to ***red spruce swamps*** at moderate elevations.

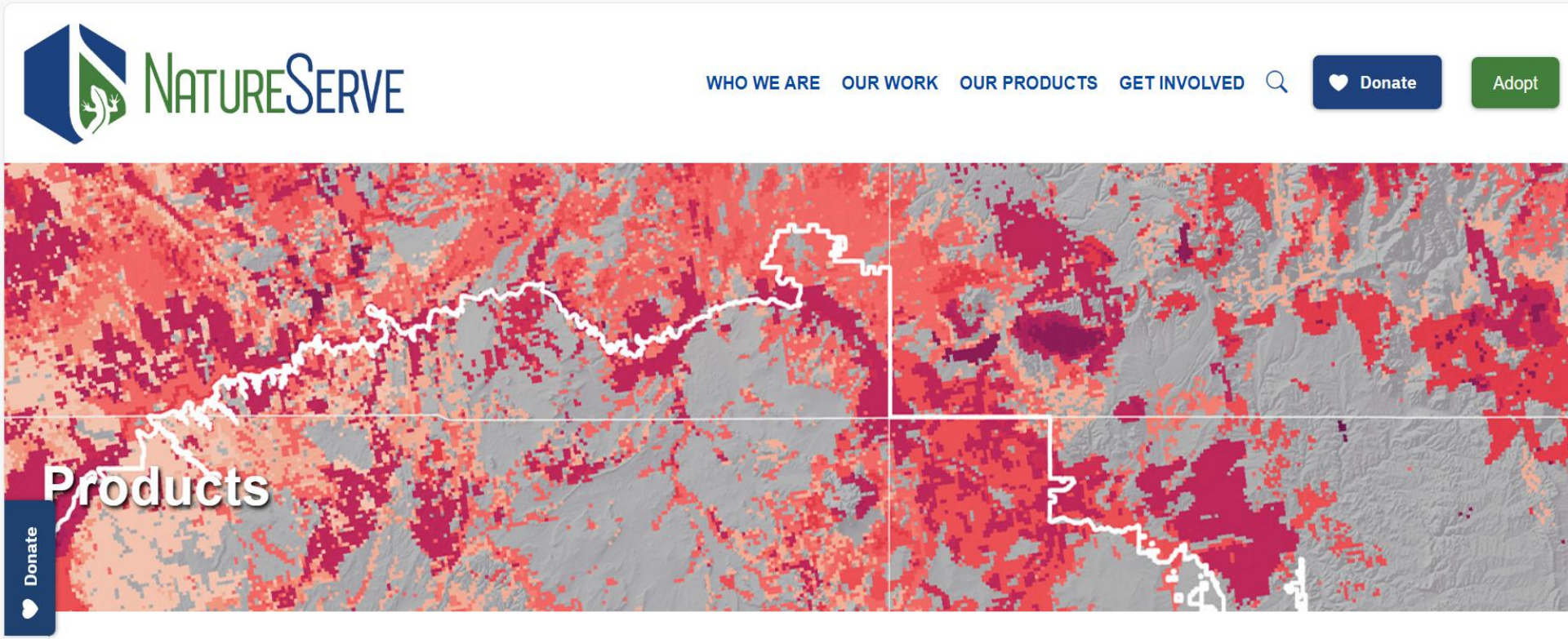
Trees and shrubs:

Herbs and bryophytes:

Reference Condition Examples (A to B+ Ranked): Pawtuckaway State Park (Nottingham) and Fox State Forest (Hillsboro).

NatureServe and Natural Heritage ecologists in four states (including NH) developed and tested Wetland EIA over a ~10-year period.

EIA is now the standard for wetland assessments for NatureServe and Natural Heritage programs across the U.S. and Canada. (Ecological Integrity Assessment | NatureServe).



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FQA and Coefficient of Conservatism (CoC)

CoC assigned to each species in entire flora by a panel of experts

CoC	Criteria
0	Non-native with wide range of ecological tolerances. Often these are opportunistic of intact undisturbed habitats.
1 to 2	Native invasive or widespread native that is not typical of (or only marginally typical of) a particular plant community; tolerant of anthropogenic disturbance.
3 to 5	Native with an intermediate range of ecological tolerances and may typify a stable native community, but may also persist under some anthropogenic disturbance.
6 to 8	Native with a narrow range of ecological tolerances and typically associated with a stable community.
9 to 10	Native with a narrow range of ecological tolerances, high fidelity to particular habitat conditions, and sensitive to anthropogenic disturbance.

Ambrosia artemisiifolia

common ragweed

CoC = 2

Betula alleghaniensis

yellow birch

CoC = 5

Potentilla robbinsiana

White Mountain cinquefoil

CoC = 10

Floristic Quality Assessment (FQA)

- Assesses degree of "naturalness" of a wetland system
- Uses CoC values coupled with plant species presence and cover within a system
- CoC values have been assigned for over ½ the states including those in the Northeast
- Initially developed by Swink & Wilhelm (1979)[1] for the Chicago region

[1] Swink, F. and G. Wilhelm. 1979. Plants of the Chicago Region. Revised and expanded edition with keys. The Morton Arboretum, IL.

Amerorchis rotundifolia
Round-leaved orchid
CoC = 9

Floristic Quality Assessment (FQA)

Two FQA indices most frequently used:

– Mean C

– Cover Weighted Mean C

Phragmites australis
common reed
CoC = 0

Caltha palustris
marsh marigold
CoC = 6

Floristic Quality Assessment (FQA)

Intact

$\overline{C} = 6.25$

CoC	# of Species →				
0					
1					
2	X				
3	X				
4	X	X	X	X	X
5	X	X	X	X	X
6	X	X	X	X	X
7	X	X	X	X	X
8	X	X	X	X	X
9	X	X	X	X	X
10	X	X	X	X	X

Slightly Impacted

$\overline{C} = 5.61$

CoC	# of Species →				
0					
1					
2	X	X			
3	X	X	X	X	
4	X	X	X	X	X
5	X	X	X	X	X
6	X	X	X	X	X
7	X	X	X		
8	X	X	X		
9	X	X			
10	X	X			

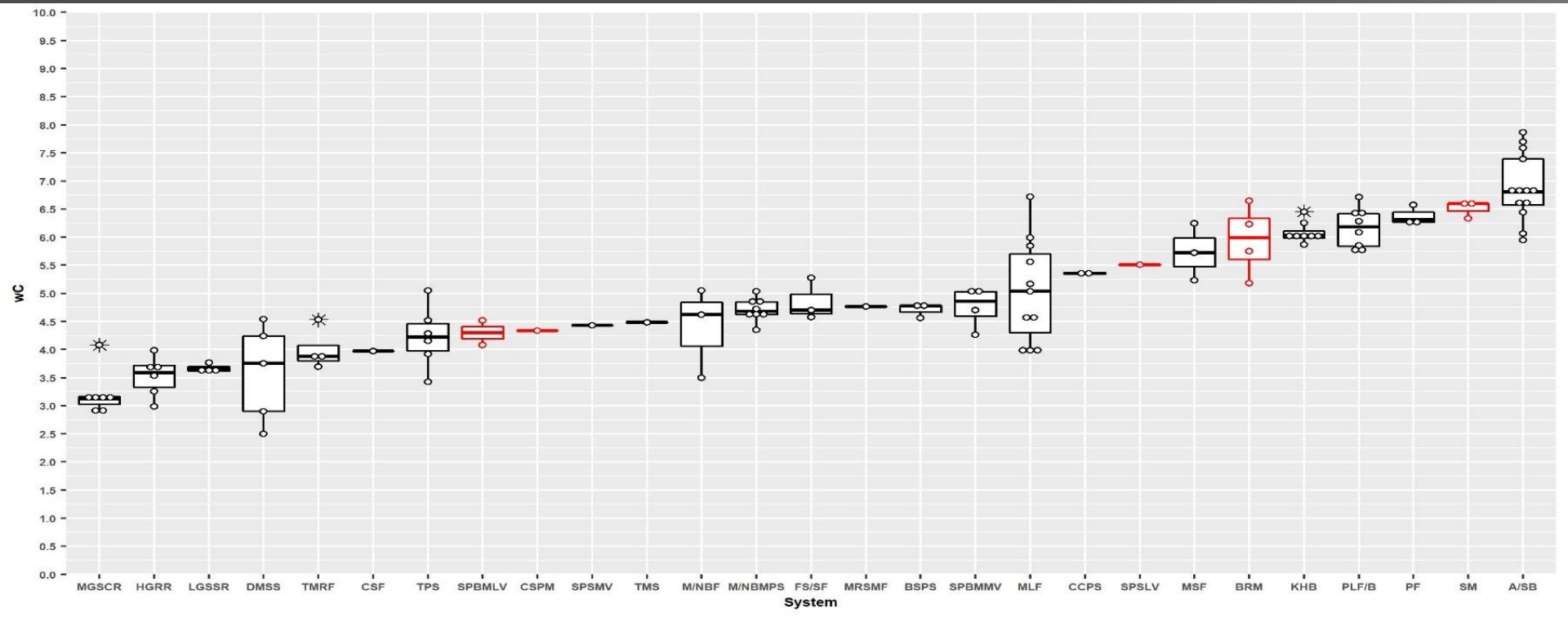
Highly Impacted

$\overline{C} = 2.84$

CoC	# of Species →				
0	X	X	X	X	X
1	X	X	X	X	X
2	X	X	X	X	X
3	X	X	X	X	
4	X	X	X		
5	X	X	X		
6	X	X			
7					
8					
9					
10					

Increasing Human Disturbance in a Poor Level Fen/Bog System

NHB Developed Benchmark/Least Impacted FQA Thresholds for each Wetland System Type in NH



State/Prov: NH **Site:** Center Harbor Neck **ObsArea Code:** NH588

ObsArea Name: Center Harbor Neck: Temperate peat swamp system **ObsDate:** 2020/07/07

Project: NH-EPA2020 **County:**

Observers:

Macrogroup:

Other System: EP00000031 Temperate peat swamp system

General Type: New Hampshire

HGM:

Cowardin:

Floristic Quality Index (FQI) Scor

N: 35 *MeanC:* 4.17 *CWMeanC:* 5.19 *FQI:* 24.68

Protocol: New Hampshire Natural Heritage Bureau 2018

	Wt	Field Rating	Field Pts	Calc Pts	Calc Rating
ECOLOGICAL INTEGRITY				3.27	B+
ECOLOGICAL INTEGRITY + SIZE (EO Rank)				2.94	B
Rank Factor: LANDSCAPE CONTEXT	0.3			3.08	B+
MEF: LANDSCAPE	0.33			3.00	B+
LAN2. Land Use Index	1	B	3		
MEF: BUFFER	0.66			3.12	B+
BUF1. Perimeter with Natural Buffer	n/a	B+	3.25		
BUF2. Width of Natural Buffer	n/a	B	3		
Rank Factor: CONDITION	0.7			3.35	B+
MEF: VEGETATION	0.55			3.42	B+
VEG2. Invasive Nonnative Plant Species Cover	1	A	4		
VEG3. Native Plant Species Composition	1	B+	3.25		
VEG4. Vegetation Structure	1	B	3		
MEF: HYDROLOGY	0.35			3.33	B+
HYD1. Water Source	1	B	3		
HYD2. Hydroperiod	1	B	3		
HYD3. Hydrologic Connectivity	1	A	4		
MEF: SOIL	0.1			3.00	B+
SOI1. Soil Condition	1	B	3		
Rank Factor: SIZE	n/a				C-
MEF: SIZE	n/a	C-			
SIZ1. Comparative Size	n/a	C-			
SIZ2. Change in Size	n/a				

NH Natural Heritage Bureau (NHB)

Approach to Wetland System Evaluation

1. NHB's natural community and system classification
2. EIA approach in evaluating wetland system condition (A to D)
3. Wetland system EIA rank specs that guide condition assessments
4. FQA and development of FQA wetland system thresholds
5. **Development of a Rapid FQA method**
6. Calculating wetland system conservation status ranks (S1 to S5)
7. How all these elements work together in determining wetland system exemplary thresholds

With WPDG funding from EPA, we are developing a

Rapid FQA Method (rFQA)

- Standard FQA is a Level 3 intense field survey approach
- rFQA is a Level 2 rapid field assessment method (RAM)
  - based on the cover of dominant species in wetland systems
- Once developed and tested, rFQA will be added to EIA as a new Vegetation Condition metric

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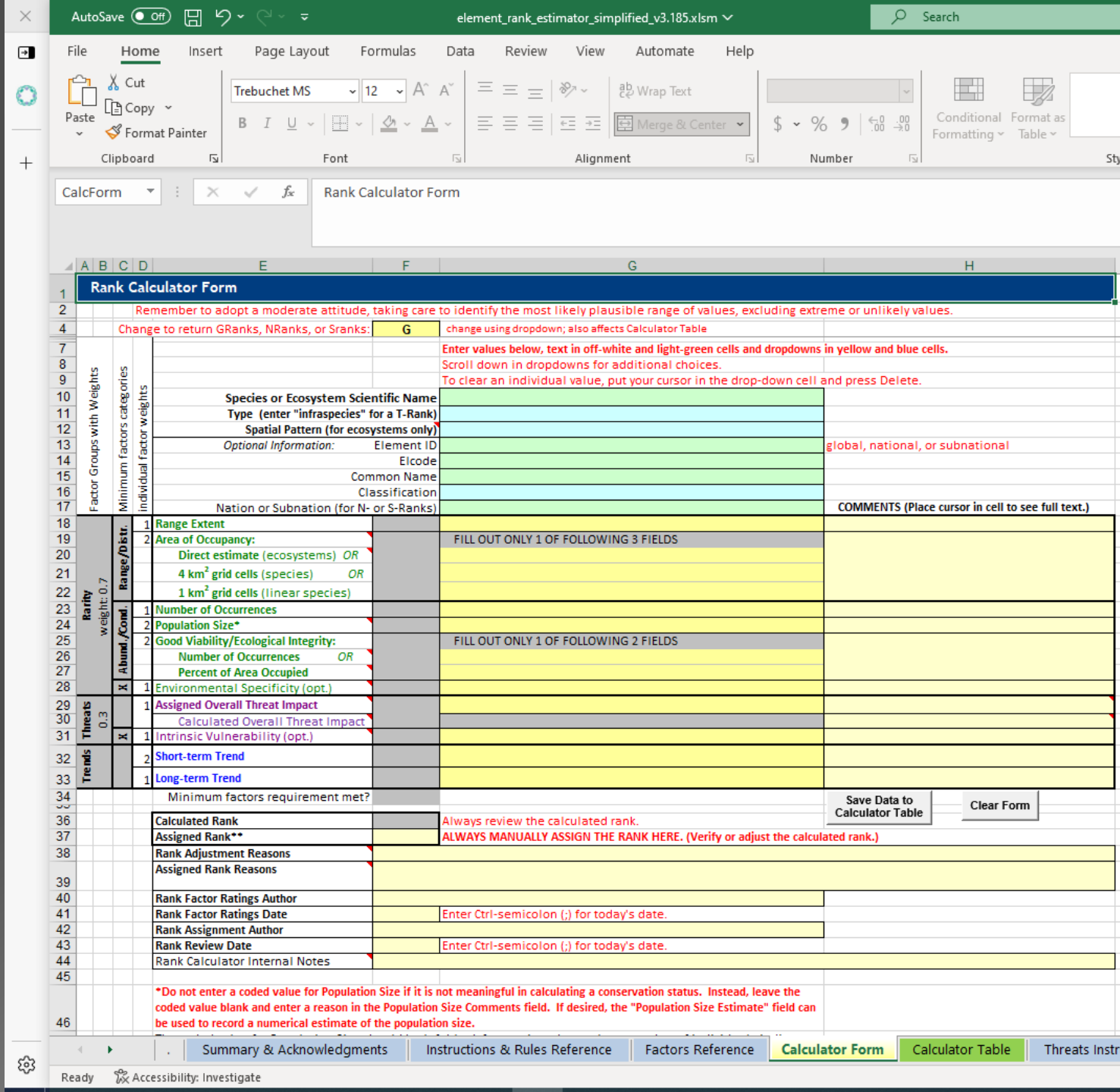
NatureServe Conservation Status Assessments: Factors for Evaluating Ecosystem Risk

Factor Category	Factor	Definition
Rarity	**Range Extent**	Minimum area that can be delimited to encompass all present occurrences of a system, typically excluding extreme disjuncts.
	Area of Occupancy	Area within the range extent that a system actually occupies. Areas can be measured or estimated directly based on the best available information.
	Number of Occurrences	Number of extant locations of a system.
	Number of Occurrences or Percent Area with Good Ecological Integrity	1) Number of systems that have excellent-to-good ecological integrity (A or B), such that there is the likelihood of persistence if current conditions prevail; OR 2) Percent of the total area occupied by a system that has excellent-to-good ecological integrity.
	Environmental Specificity	The degree to which a system depends on a relatively scarce set of abiotic and/or biotic factors within the overall range. Relatively narrow requirements are thought to increase the vulnerability of a system.
Threats	**Overall Threat Impact**	Degree to which the integrity of a system is affected by extrinsic factors (stressors) that degrade integrity, and which are characterized in terms of scope and severity. Threats are typically anthropogenic, having either direct (e.g., habitat destruction) or indirect (e.g., introduction of invasive species) impact.
	Intrinsic Vulnerability	Degree to which intrinsic characteristics, such as likelihood of reestablishment for an impacted system, make it susceptible or resilient to natural or anthropogenic stresses or catastrophes.
Trends	**Long-term Trend**	Degree of past directional change in a system types extent, area of occupancy, number of occurrences, and/or ecological integrity over the long term (~200 years).
	Short-term Trend	Degree of past directional change in a system types extent, area of occupancy, number of occurrences, and/or ecological integrity in the short term (~50 years).

NatureServe Conservation Status Rank Calculator



AutoSave Off element_rank_estimator_simplified_v3.185.xlsm Search

File Home Insert Page Layout Formulas Data Review View Automate Help

Cut Copy Format Painter Paste Clipboard Trebuchet MS 12 Font Wrap Text Merge & Center Alignment Number Conditional Formatting Format as Table

CalcForm Rank Calculator Form

Rank Calculator Form

Remember to adopt a moderate attitude, taking care to identify the most likely plausible range of values, excluding extreme or unlikely values.

Change to return GRanks, NRanks, or Sranks: G change using dropdown; also affects Calculator Table

Enter values below, text in off-white and light-green cells and dropdowns in yellow and blue cells.
Scroll down in dropdowns for additional choices.
To clear an individual value, put your cursor in the drop-down cell and press Delete.

Factor Groups with Weights	Minimum factors categories	individual factor weights		
			Species or Ecosystem Scientific Name	
			Type (enter "infraspecies" for a T-Rank)	
			Spatial Pattern (for ecosystems only)	
			Optional Information: Element ID	global, national, or subnational
			Elcode	
			Common Name	
			Classification	
			Nation or Subnation (for N- or S-Ranks)	COMMENTS (Place cursor in cell to see full text.)
Rarity weight: 0.7	Range/Dist.	1	Range Extent	
		2	Area of Occupancy:	FILL OUT ONLY 1 OF FOLLOWING 3 FIELDS
			Direct estimate (ecosystems) *OR*	
			4 km² grid cells (species) *OR*	
			1 km² grid cells (linear species)	
	Abund./Cond.	1	Number of Occurrences	
		2	Population Size*	
		2	Good Viability/Ecological Integrity:	FILL OUT ONLY 1 OF FOLLOWING 2 FIELDS
			Number of Occurrences *OR*	
			Percent of Area Occupied	
	X	1	Environmental Specificity (opt.)	
Threats 0.3		1	Assigned Overall Threat Impact	
			Calculated Overall Threat Impact	
	X	1	Intrinsic Vulnerability (opt.)	
Trends		2	Short-term Trend	
		1	Long-term Trend	
			Minimum factors requirement met?	

Save Data to Calculator Table | Clear Form

Calculated Rank		Always review the calculated rank.
Assigned Rank**		ALWAYS MANUALLY ASSIGN THE RANK HERE. (Verify or adjust the calculated rank.)
Rank Adjustment Reasons		
Assigned Rank Reasons		
Rank Factor Ratings Author		
Rank Factor Ratings Date		Enter Ctrl-semicolon (;) for today's date.
Rank Assignment Author		
Rank Review Date		Enter Ctrl-semicolon (;) for today's date.
Rank Calculator Internal Notes		

*Do not enter a coded value for Population Size if it is not meaningful in calculating a conservation status. Instead, leave the coded value blank and enter a reason in the Population Size Comments field. If desired, the "Population Size Estimate" field can be used to record a numerical estimate of the population size.

Summary & Acknowledgments | Instructions & Rules Reference | Factors Reference | Calculator Form | Calculator Table | Threats Instr

Ready Accessibility: Investigate

New vs. previous conservation status ranks for 27 wetland systems in NH

System Name	New Rank	Previous Rank
Alpine/subalpine bog system	S1	S1
Coastal salt pond marsh system	S1	S1
Montane sloping fen system	S1	S1
Patterned fen system	S1	S1
Brackish riverbank marsh system	S1	S1S2
Sand plain basin marsh system	S1	S2
Sandy pond shore system	S1	S2
Salt marsh system	S1	S3
Calcareous sloping fen system	S1S2	S2
Coastal conifer peat swamp system	S1S2	S2
Sparsely vegetated intertidal system	S1S2	S3
Major river silver maple floodplain system	S2	S2
Montane/near-boreal floodplain system	S2	S2
Kettle hole bog system	S2	S2S3
Montane/near-boreal minerotrophic peat swamp system	S2	S2S3
Subtidal system	S2	S3
Black spruce peat swamp system	S2S3	S3
High-gradient rocky riverbank system	S3	S3
Poor level fen/bog system	S3	S3
Temperate minor river floodplain system	S3	S3
Low-gradient silty-sandy riverbank system	S3	S3S4
Moderate-gradient sandy-cobbly riverbank system	S3	S3S4
Medium level fen system	S3S4	S3S4
Temperate minerotrophic swamp system	S3S4	S4
Temperate peat swamp system	S3S4	S4?
Forest seep/seepage forest system	S4	S3S4
Drainage marsh - shrub swamp system	S5	S5

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What are exemplary systems?

After evaluating a system's ecological integrity (A to D condition) and knowing the system's conservation status rank (S1 to S5), exemplary occurrences range from…

- all examples (A–D) of rare types (S1) to
- high quality examples (A) of common types (S5)

NHPs track exemplary systems (and natural communities) because they are among the best remaining examples of biological diversity in NH

Massabesic Lake
Auburn

Decision matrix to determine exemplary status for ecosystems (systems and natural communities)

Global / State Conservation Status Rank Combination	Ecological Integrity Assessment Rank			
	A (+ or -) Excellent Integrity	B (+ or -) Good Integrity	C (+ or -) Fair Integrity	D (+ or -) Poor Integrity
G1S1, G2S1, GNRS1, GUS1				
G2S2, GNRS2, G3S1, G3S2, GUS2				
GUS3, GNRS3, G3S3, G4S1, G4S2, G5S1, G5S2, any SNR				
G4S3, G4S4, G5S3, G5S4, G5S5, GNRS4, GNRS5, GUS4, GUS5				

Green Shading = Element Occurrence

From a Natural Heritage perspective, impacting an S4 or S5 system in fair to poor condition is not the same as a similar impact to an S1 or S2 system in good to excellent condition – a difference that ideally would be considered in wetland permit review and mitigation response.

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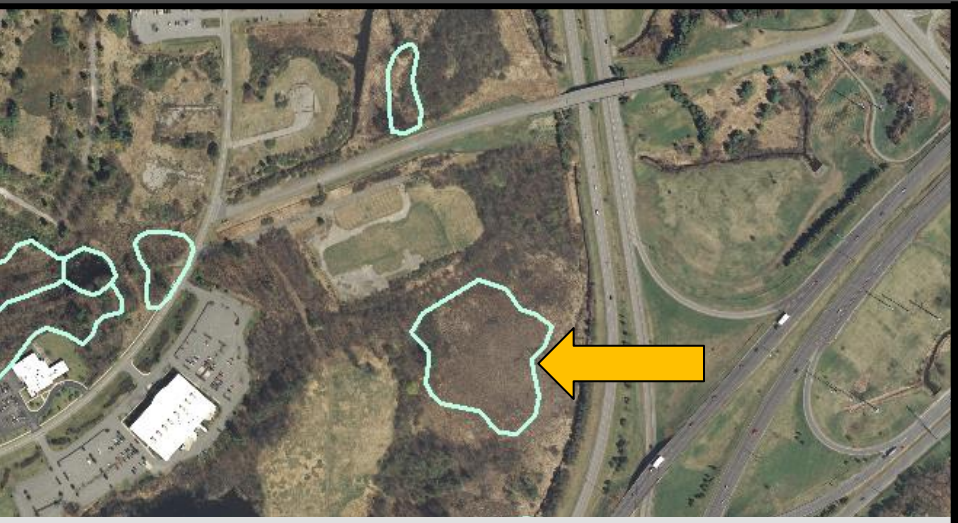

Drainage marsh - shrub swamp system (S5)
Ecological Integrity = C

- **Mixed tall graminoid - scrub-shrub marsh (S4S5)**
- **Tall graminoid meadow marsh (S4)**

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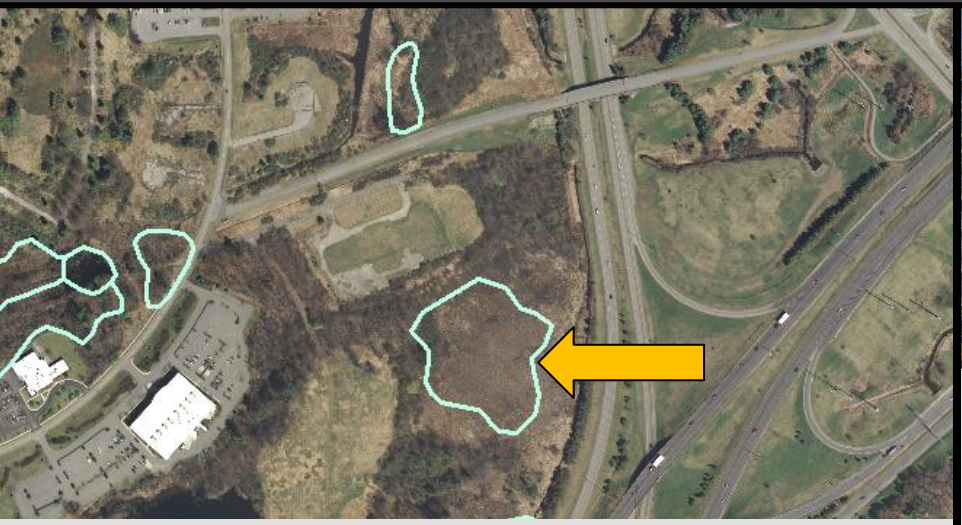

Drainage marsh - shrub swamp system (S5)
Ecological Integrity = C
- **Mixed tall graminoid - scrub-shrub marsh (S4S5)**
- **Tall graminoid meadow marsh (S4)**

Circumneutral patterned fen system (S1)
Ecological Integrity = A
- **Northern white cedar circumneutral string (S1)**
- **Circumneutral - calcareous flark (S1)**

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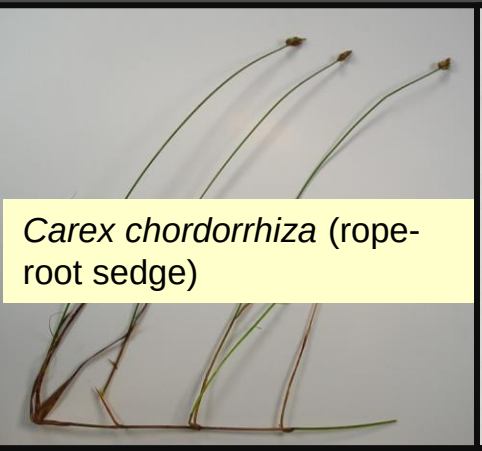
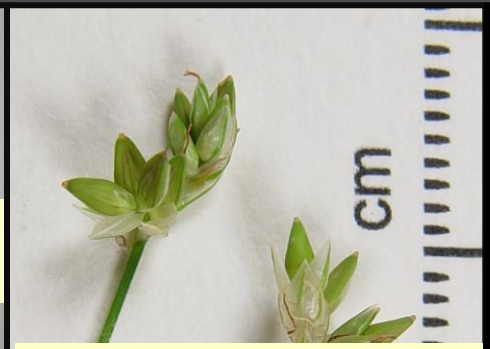


Carex chordorrhiza (rope-root sedge)



Carex tenuiflora (sparse-flowered sedge)

Circumneutral patterned fen system (S1)
Ecological Integrity = A
- **Northern white cedar circumneutral string (S1)**
- **Circumneutral - calcareous flark (S1)**

Juncus stygius (moor rush)

Carex livida (livid sedge)

Collectively, all these elements work together to provide science-based tools and products that better inform conservation, wetland permit review, and mitigation.

Natural Heritage Bureau DataCheck Tool

Wetlands Permitting Resource

NEW HAMPSHIRE DEPARTMENT OF Environmental Services


Questions