



# Baseline floristic assessment & classification of pine barrens vernal ponds in NY

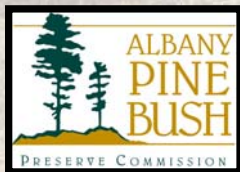
**Jason Bried**

*The Nature Conservancy of Eastern New York*



**&**

*Albany Pine Bush Preserve Commission*



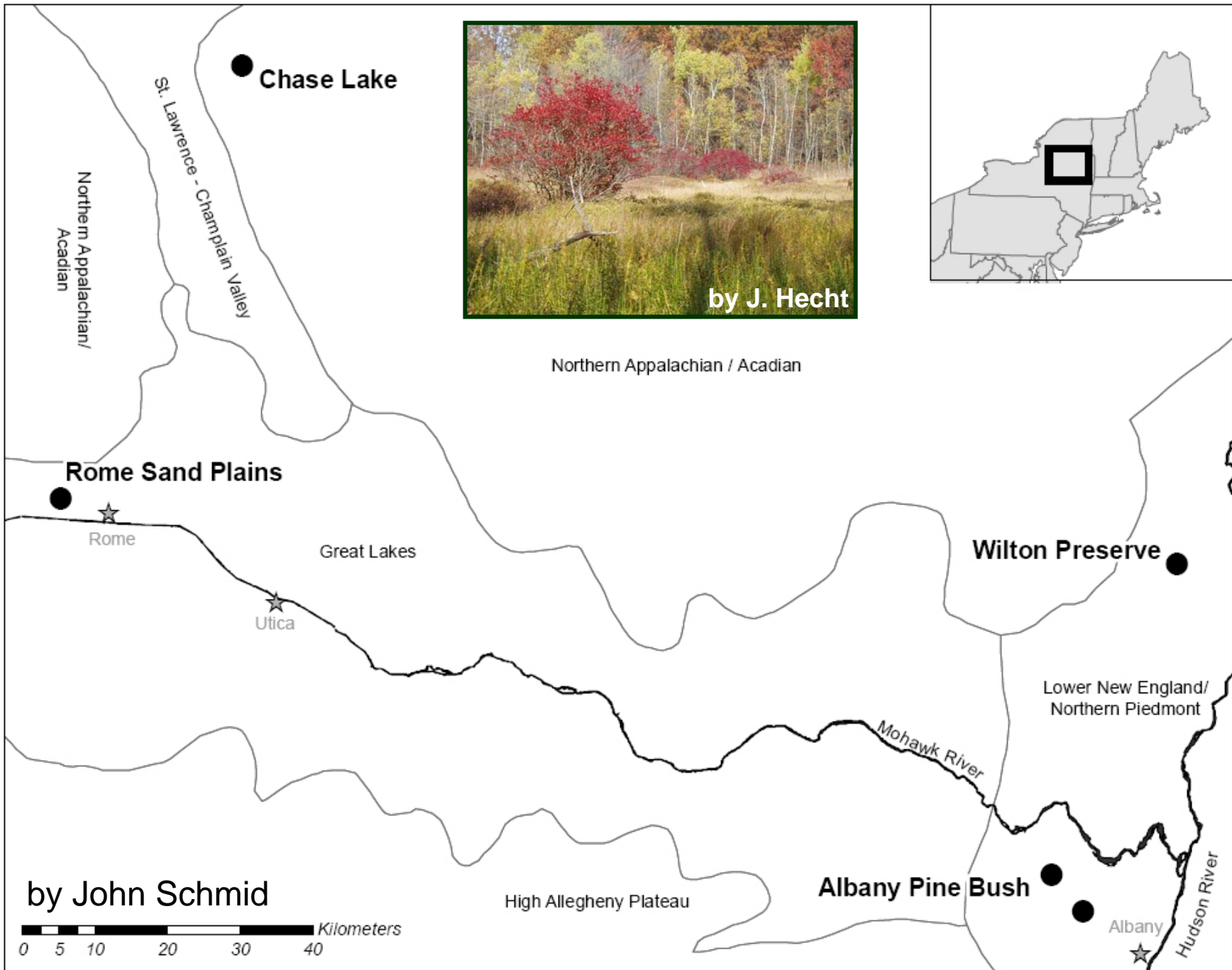
**Greg Edinger**

*New York Natural Heritage Program*

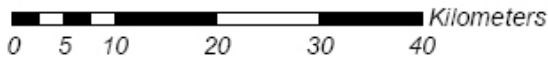


# Outline

- 1) **Where are PBVP?**
- 2) **What are PBVP?**
- 3) **Floristic classification**
- 4) **Floristic assessment**
- 5) **Conclusions**

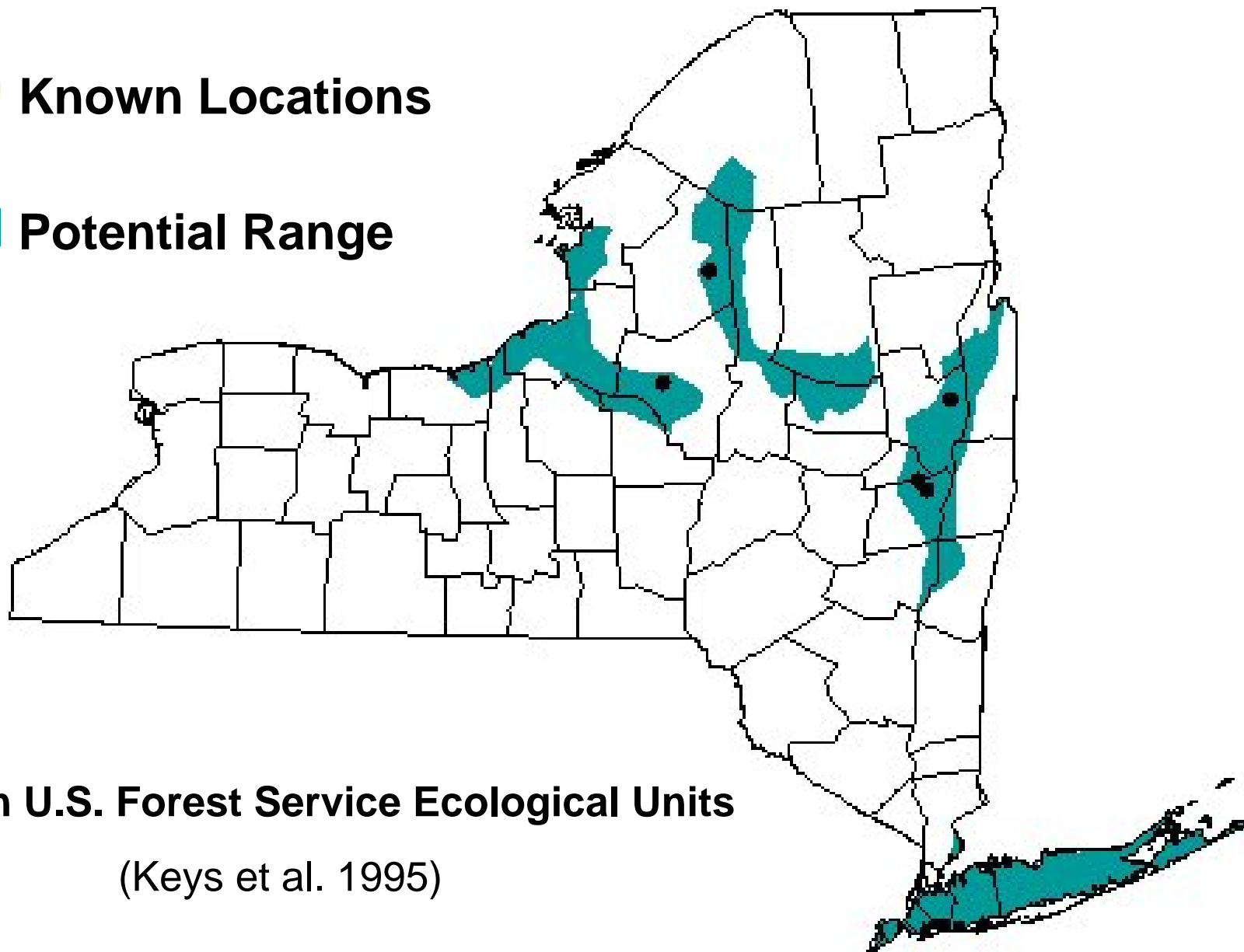


by John Schmid



■ **Known Locations**

■ **Potential Range**



**Based on U.S. Forest Service Ecological Units**

(Keys et al. 1995)

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# Pine Barrens Vernal Pond



Hoary sedge (*Carex canescens*)



Leatherleaf (*Chamaedaphne calyculata*)



Hardhack spiraea (*Spiraea tomentosa*)



Buttonbush (*Cephalanthus occidentalis*)



# What are they?

- Rare species like spotted turtle and Jefferson / blue-spotted salamander complex



by K. Breisch



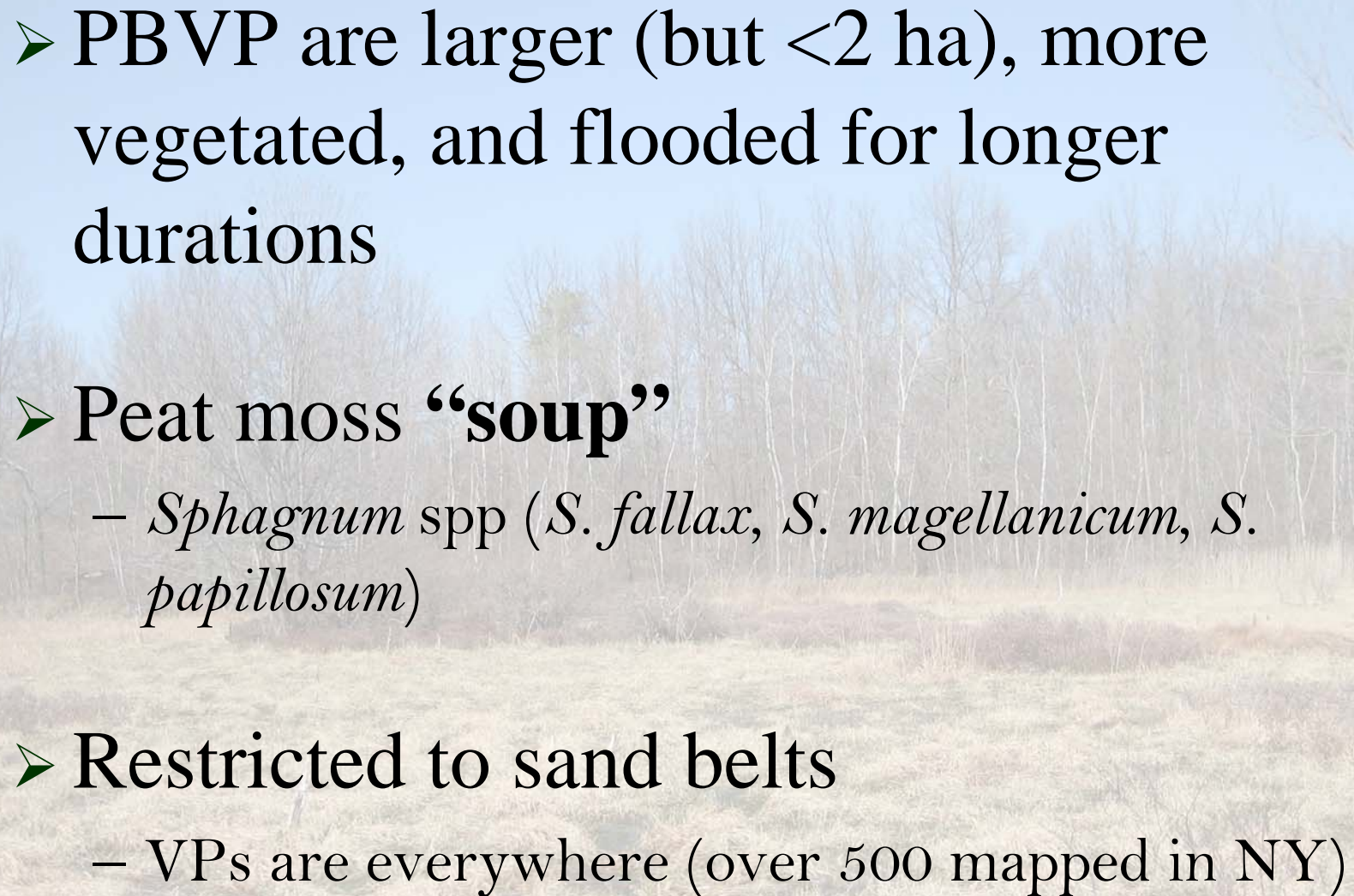
by M. Ignoffo

- Attract diverse adult dragonflies and damselflies
  - Ringed Boghaunter (???)



**What are they not?**

vernal pools

- 
- PBVP are larger (but <2 ha), more vegetated, and flooded for longer durations
  - Peat moss “**soup**”
    - *Sphagnum* spp (*S. fallax*, *S. magellanicum*, *S. papillosum*)
  - Restricted to sand belts
    - VPs are everywhere (over 500 mapped in NY)

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# Issues in NY

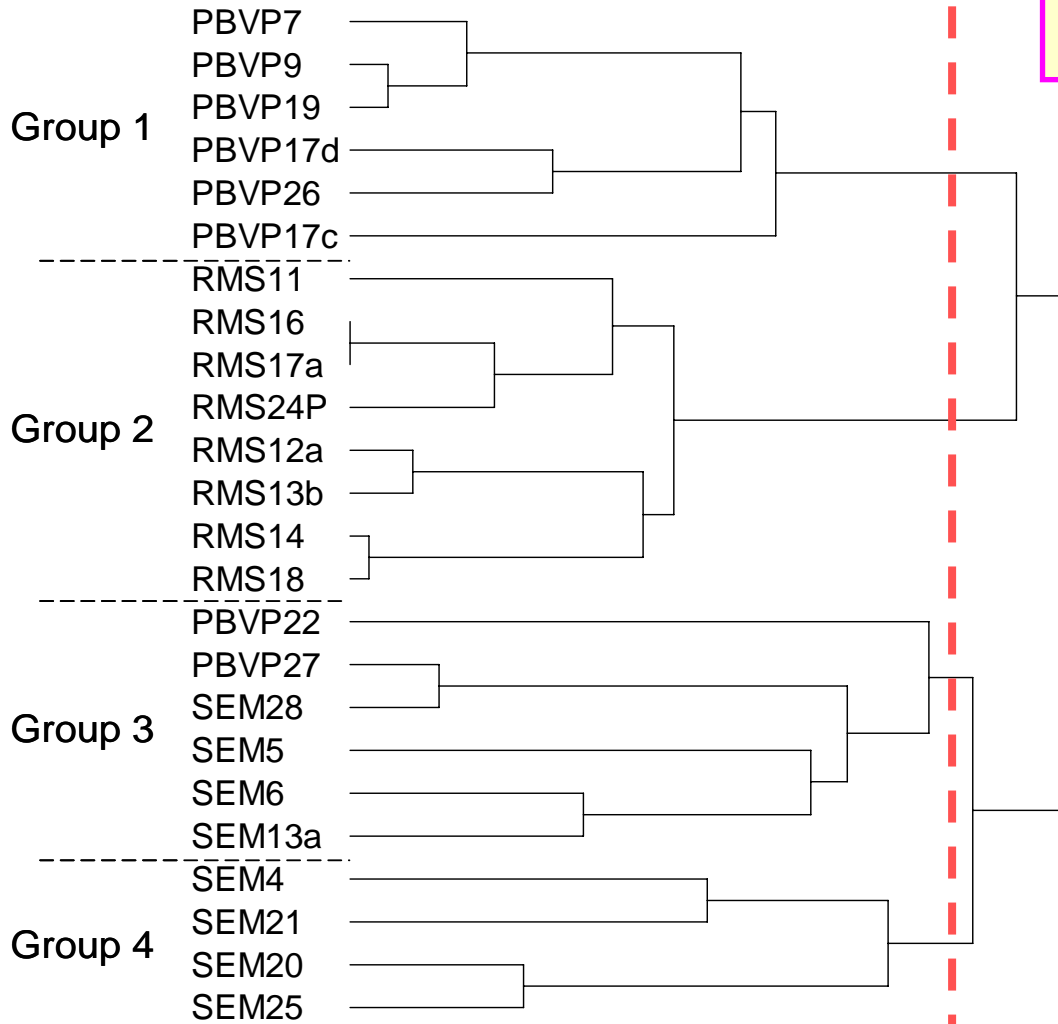
➤ Superficially similar to co-occurring wetlands

E.g., wet meadows, shrub swamps

➤ No statistical tests of field-based classification

# Data set

- detailed Albany Pine Bush wetland floristic inventory (by Janet Mattox)
- ‘complete census’ visits in 1992 and 1993
- 227 species recorded, 70 retained for analysis
- 24 sites
  - 8 “pine barrens vernal ponds” (PBVP)
  - 8 shallow emergent marshes (SEM)
  - 8 red maple swamps (RMS)

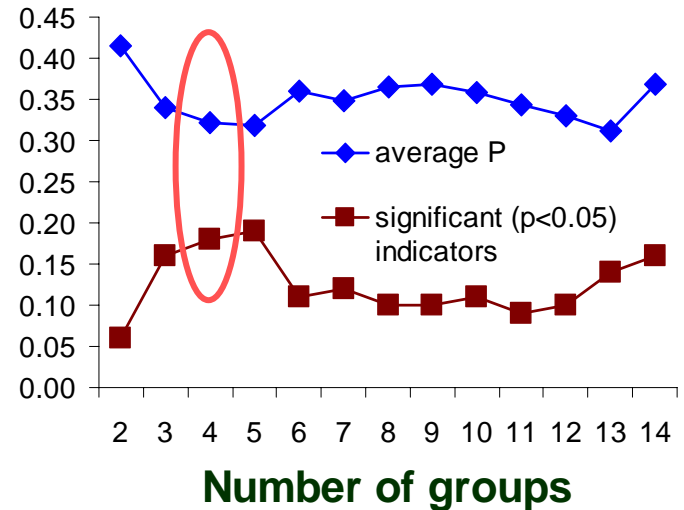


## Group-average linkage



by J. Hecht

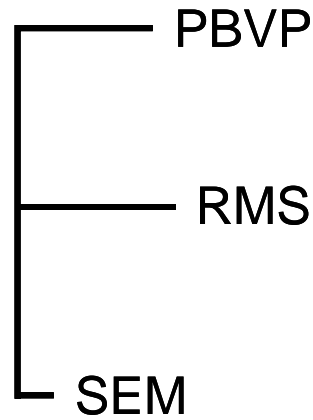
## Indicator species optimization



Bried & Edinger,  
*manuscript in review*



a priori  
classification  
strength

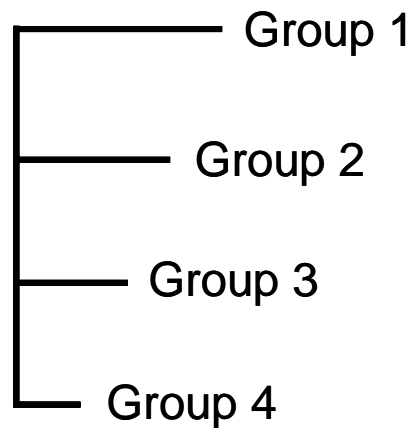


$M = 0.513$



**Jaccard similarity**

re-classification  
strength



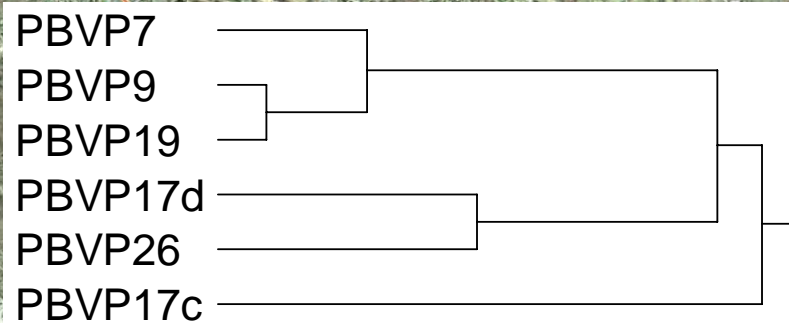
$M = 0.453$



**Jaccard similarity**



**proposed new occurrence**



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# Threats

**Development**

**Runoff**

**contamination**

**Hydrologic  
alteration**

**Invasive  
plants**

**Sedimentation**

## Albany Pine Bush PBVP

- ✓ **High-speed trains**
- ✓ **Landfill**
- ✓ **Sand and gravel mine**
- ✓ **ATV recreation**
- ✓ **Paved roads**

# Data

- **Mattox again (Albany Pine Bush)**
  - 8 pine barrens vernal ponds (PBVP)
  - 8 red maple swamps (RMS)
  - 8 shallow emergent marshes (SEM)
  
- **NY Natural Heritage surveys of PBVP**
  - 4 landscapes, 5 occurrences, 11 sites
  - surveyed piecemeal over 10 years

# Floristic Quality Assessment Index

$$\text{FQAI} = \bar{C} \times \sqrt{N} = \frac{\sum C}{N} \times \sqrt{N} = \frac{\sum C}{\sqrt{N}}$$

$C$  = conservatism coefficient

$N$  = native or total species richness

## Limitations

- ✓ excludes exotic species and their unique impacts
- ✓ biased by species richness

# FQAI''

$$\frac{\overline{C}_s}{10} \times \sqrt{\frac{N}{S}} \times \sqrt{(IScore_{\max})^{-1}}$$

Bried & Edinger,  
*manuscript in review*



S = total species  
richness

# Invasiveness ranks (*IScore*)

- “New York Non-native Plant Invasiveness Ranking System”
  - Modified from Alaska NHP and cooperating agencies
- 22 criteria geared towards *potential* impact
  - Structural & functional impact (40% weight)
  - Reproductive & competitive traits (25%)
  - Ecological amplitude & distribution (25%)
  - Feasibility of control (10%)
- Final scores from 0 (no impact) to 100 (maximally invasive)

# Albany Pine Bush results

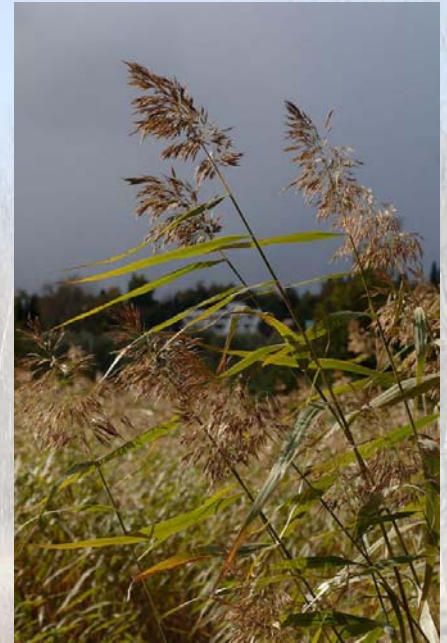


*IScore* = 78

**High-threat Exotics**

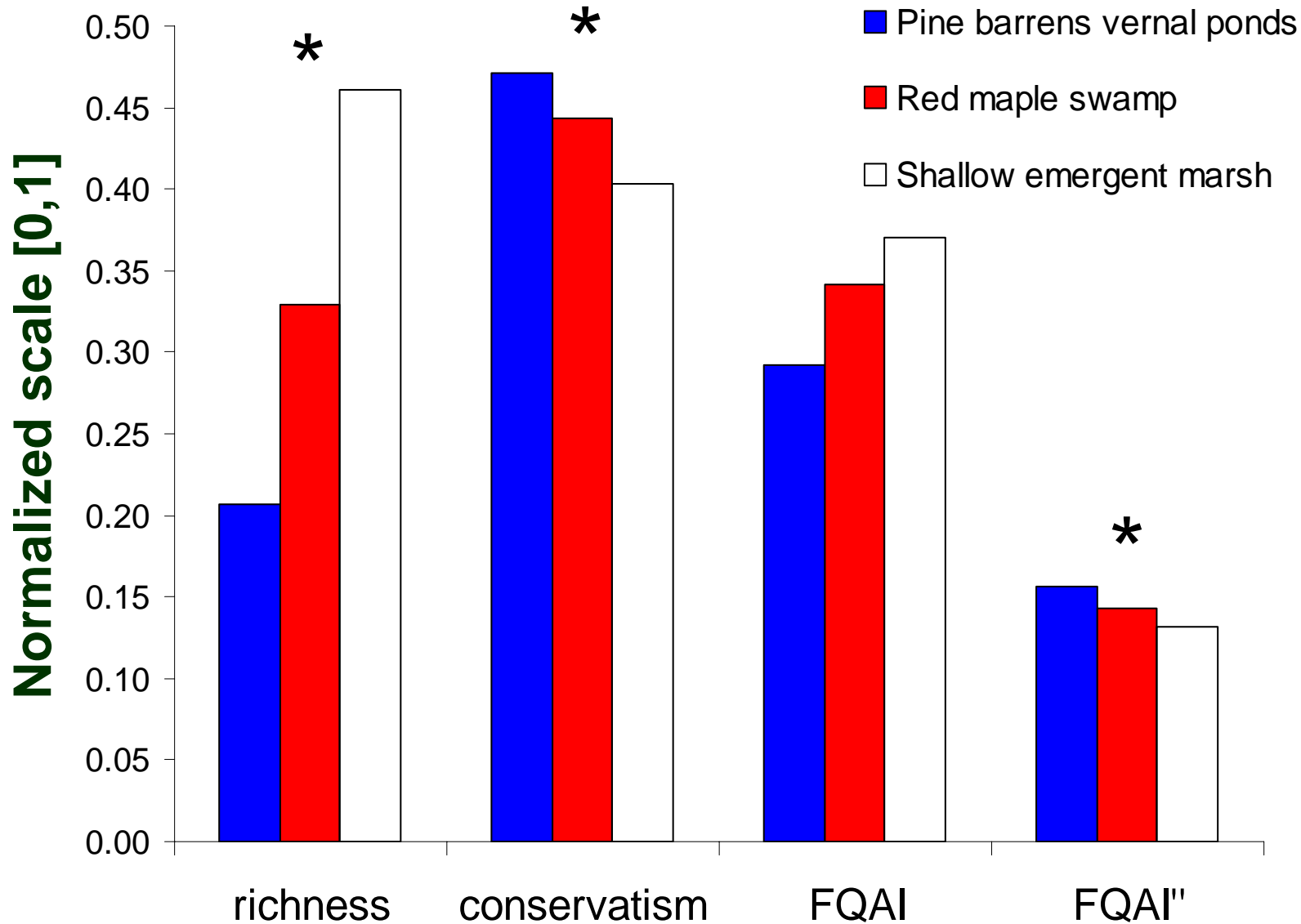


*IScore* = 83



*IScore* = 85

**PBVP are minimally invaded!!**



**\* Significant difference between PBVP and SEM**

# Statewide

<b>PBVP occurrence</b>	<b>Mean conservatism</b>	<b>Mode conservatism</b>	<b>Range conservatism</b>
Albany Pine Bush East	3.4	5	0 to 6
Albany Pine Bush West	5.4	5	3 to 7
Chase Lake (5 sites)	4.6	2	1 to 10
Rome Sand Plains	4.3	3	2 to 9
Wilton Preserve (3 sites)	4.1	5	1 to 9

PBVP may have a clean  
bill of health



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# Summary

## Classification

- Improved the field-based classification
- Evidence for a new occurrence

## Assessment

- Few total species
- Few exotic species
- Relatively high floristic quality
- Moderate conservatism

# Classification needs

- Survey co-occurring wetlands in each PBVP landscape
- Broader refinement in the northeast
  - NatureServe lumps PBVP under ‘coastal plain pondshore’ with weak classification strength

# Assessment needs

- New floristic survey in all landscapes
- Routine monitoring
- Formally characterize threats  
e.g., Level 2 rapid assessments
- Develop NY conservatism database

# Thank you

## New York Natural Heritage Program

**Steve Young, Chief Botanist**

**John Schmid, GIS Specialist**

**Tim Howard, Director of Science**

**Also...**

**Stacie Solie**

**Erica Giles**

**Jessica Nix**