

Vermont Vernal Pool Mapping Project (VPMP)

*Using Aerial Photo Interpretation and Field-verification
to Map State-wide Distribution of Vernal Pools*

Steven D. Faccio – *Vermont Center for Ecostudies*

Michael Lew-Smith – *Arrowwood Environmental*

Aaron Worthley – *Arrowwood Environmental*



Vermont Wildlife Action Plan

Species of Greatest Conservation Need



Jefferson Salamander
High Priority SGCN



Spotted Salamander
Medium Priority SGCN



Blue-spotted Salamander
Medium Priority SGCN



Four-toed Salamander
Medium Priority SGCN

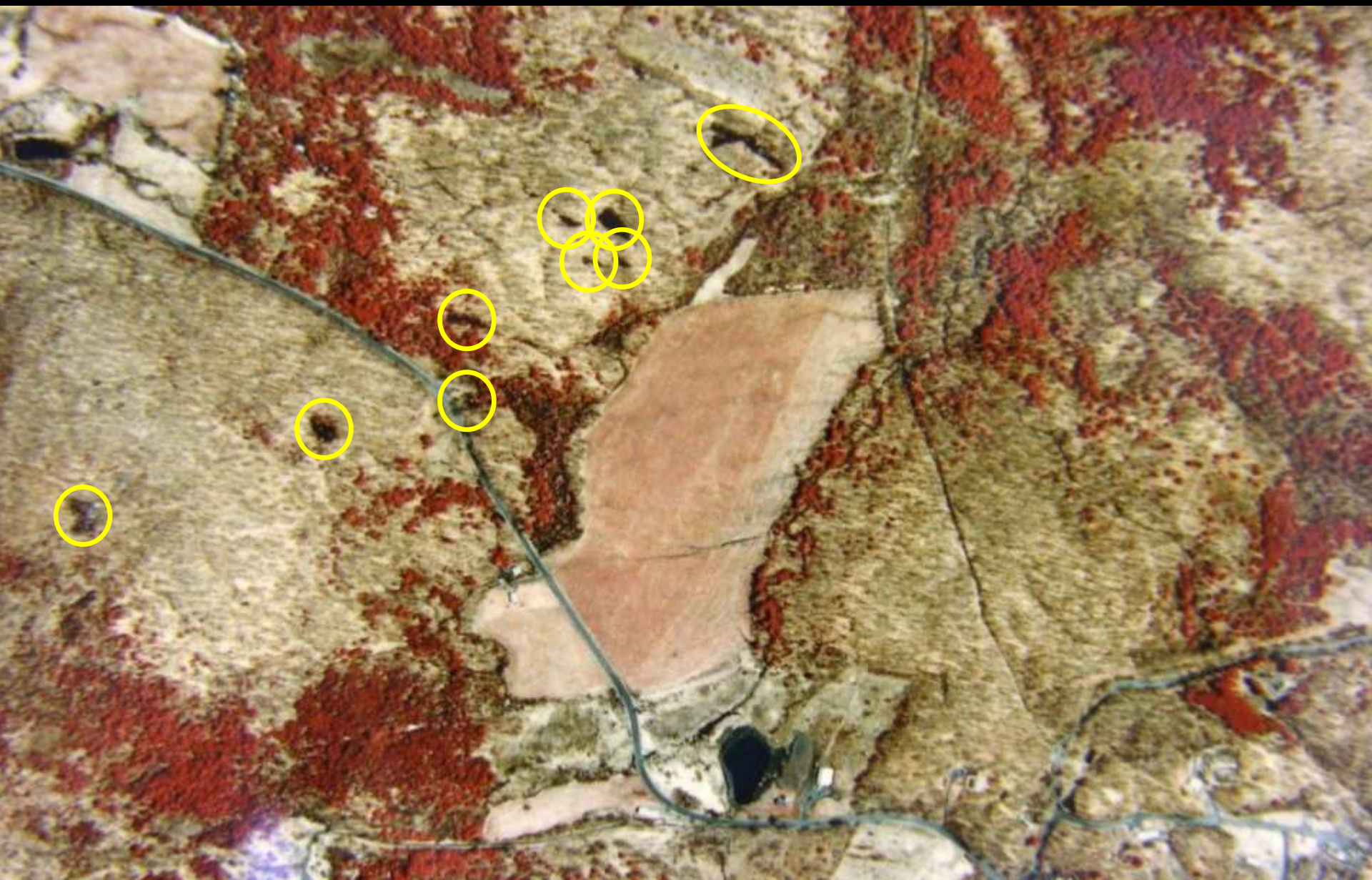
“Map and inventory
vernal pools statewide”

VPMP Objectives

- 1) Identify and map the location of *potential* vernal pools in Vermont using color-infrared (CIR) aerial photo interpretation;
- 2) Recruit and train volunteers to field-verify potential vernal pools and collect data on biological and physical attributes.

1:40,000 Paired Color Infrared

Flown April-May 1992-93





Errors Associated with Remote Mapping

Type I Error – False positive (mapping a potential pool where none exists). Mostly due to shadows from large conifers, seeps, large puddles, skidder ruts, etc.

Type II Error – False negative (not mapping a pool when one is actually present). Most common in conifer stands.

For each mapped potential pool...

Pool Confidence Rank:

Low – prob. not a pool; not on ortho, topog. looks unlikely

Med. Low – possible pool; not on ortho; topog. marginal

Medium – likely pool; not on ortho; topog. good

Med. High – probable pool; may be on ortho; topog. good

High – definite pool; visible on ortho; topog. excellent

Volunteer Training Workshops



- 13 free workshops attended by >350 people
- Indoor & outdoor portions



Vernal Pool Field-Verification

Meet Physical & Biological Criteria

- Ephemeral hydrology
- Hydrologically isolated from permanent wetlands
(e.g. no permanent inlet or outlet)
- Presence of at least one of 6 “indicator species”
(adults, eggs, or larvae)

Indicator Species



Spotted Salamander



Jefferson salamander



Blue-spotted Salamander



Wood Frog



Fairy Shrimp



Fingernail clams*

Landowner Permission!!



Vt Vernal Pool Mapping Project

Potential Pools- Field Checked 2013

- ◆ Yes

Potential Pools- Not Field Verified

- Access Allowed
- ✕ Access Denied
- Permission Status Unknown

Field Verified Vernal Pools

- Confirmed Pools
- Probable Pools- additional data needed
- Probable Pools- additional data needed

Remote Pools- Not Field Verified: DOUGHTY LAWRENCE A & KATHRYN H

UNIQUE_ID	SDF795
CONFIDENCE	MH
LOC_ACCUR	H
Lat	43.790311
Long	-72.390347
LandOwnerName	DOUGHTY LAWRENCE A & KATHRYN H
LandOwnerPhone	(802) 763-2987
LandOwnerAddress	687 FAY BROOK RD
LandOwnerPermitNotes	Call first, owner would like to know when you'll be there.
LandOwnerPermission	Access Allowed
SignUpName 2013	
Date 2013	No

[Zoom to](#)

ARROWWOOD ENVIRONMENTAL
VERMONT CENTER ECOSTUDIES

www.arrowoodvt.com/VPLandownerMap.html

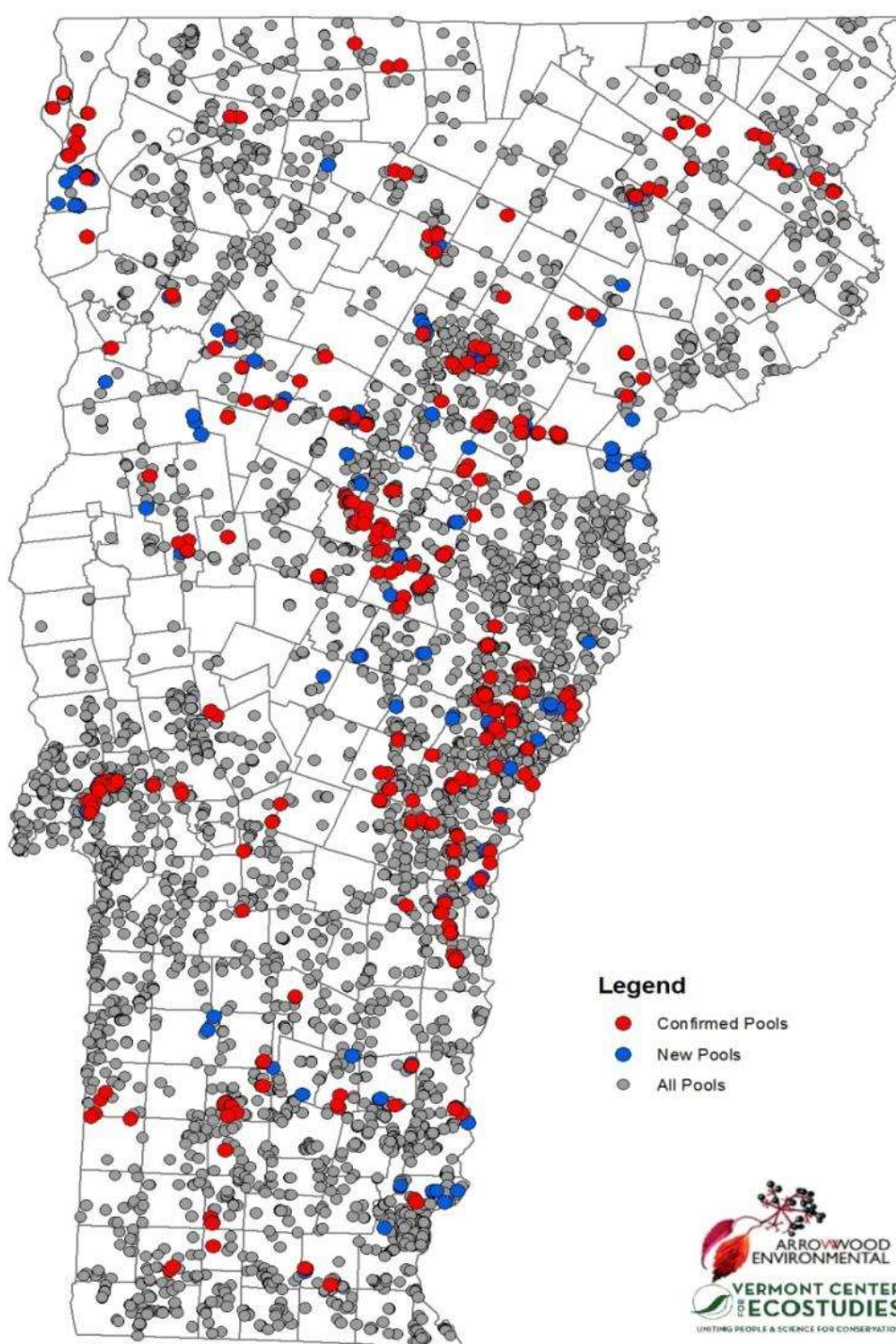
Results

4,026 potential pools

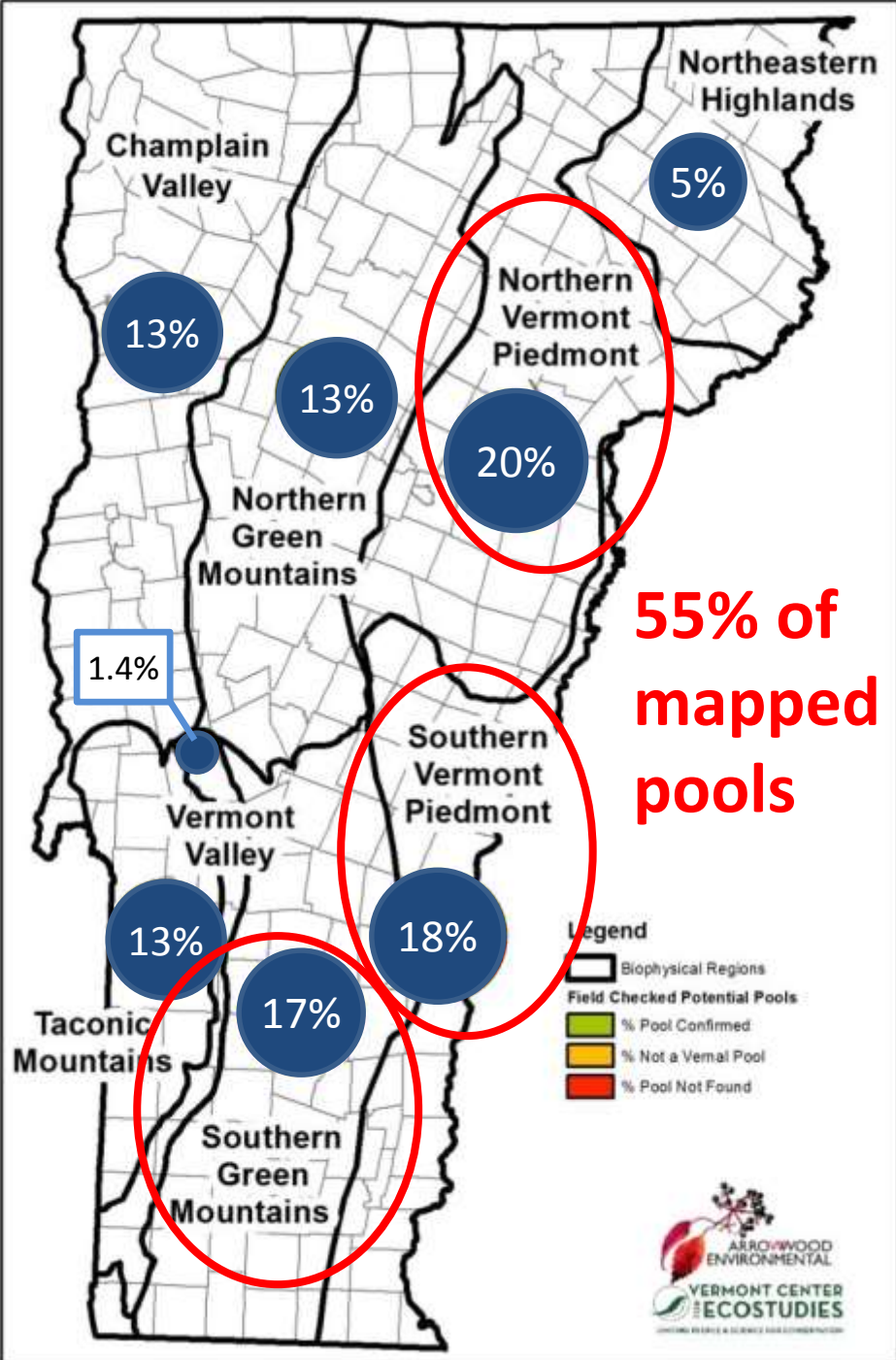
636 (16%) were field-visited

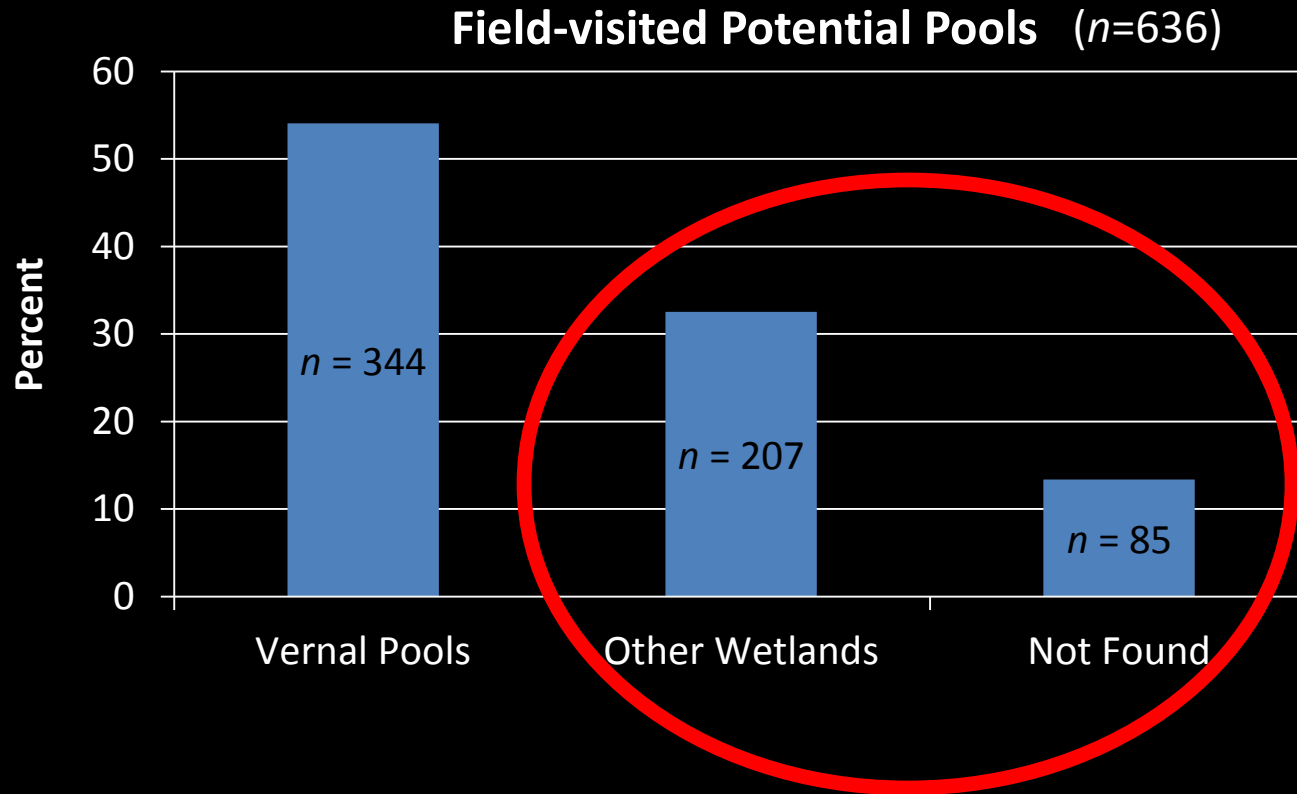
344 (54%) were VPs

221 “New” (unmapped) VPs



Distribution of mapped pools by biophysical region





71% were other types of wetlands (e.g. seeps, beaver ponds, shrub swamps, etc.).

29% were artifacts of remote mapping, primarily shadows from conifers.





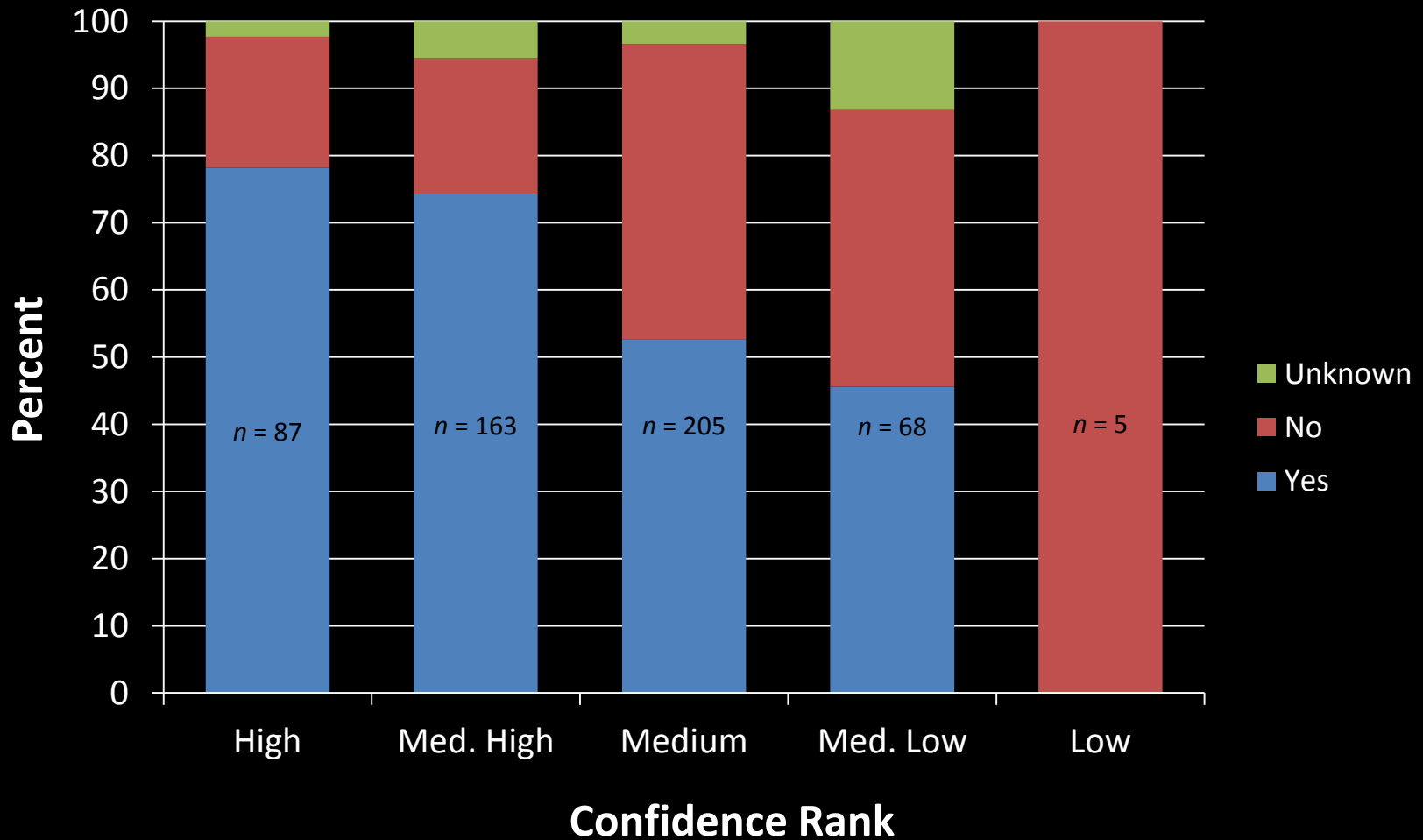
1960 Ford Galaxie Starliner



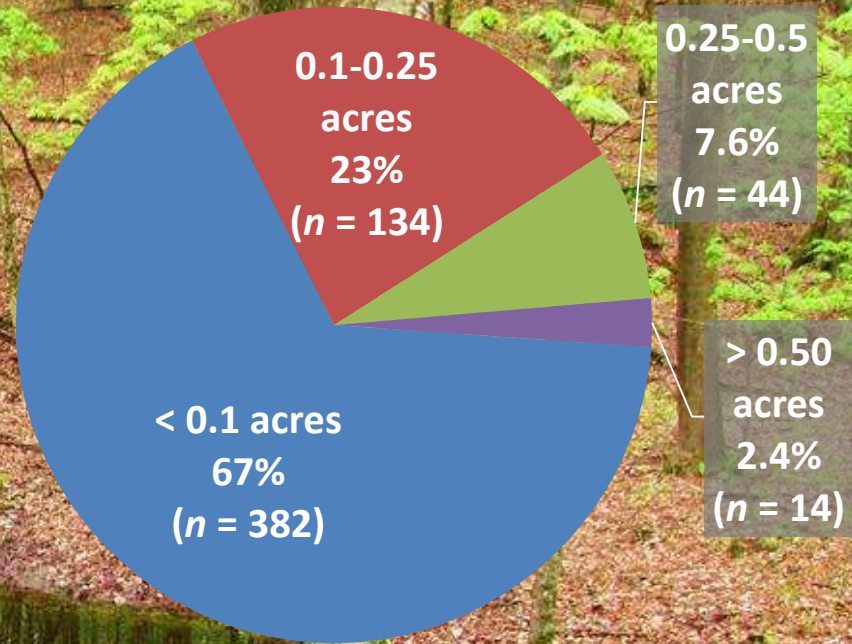
1962 Volvo 544



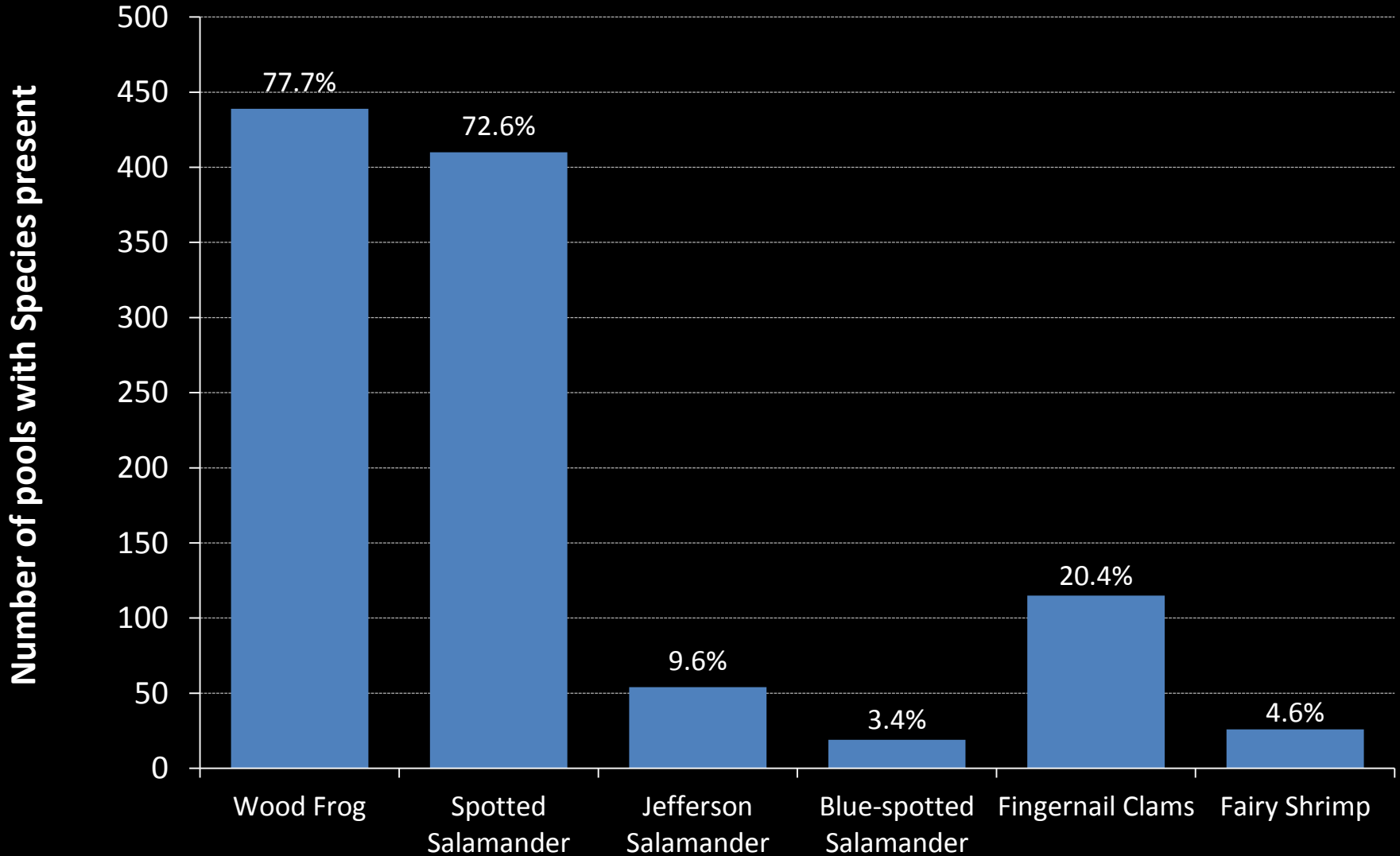
Proportion of field-verified pools by mapped confidence rank

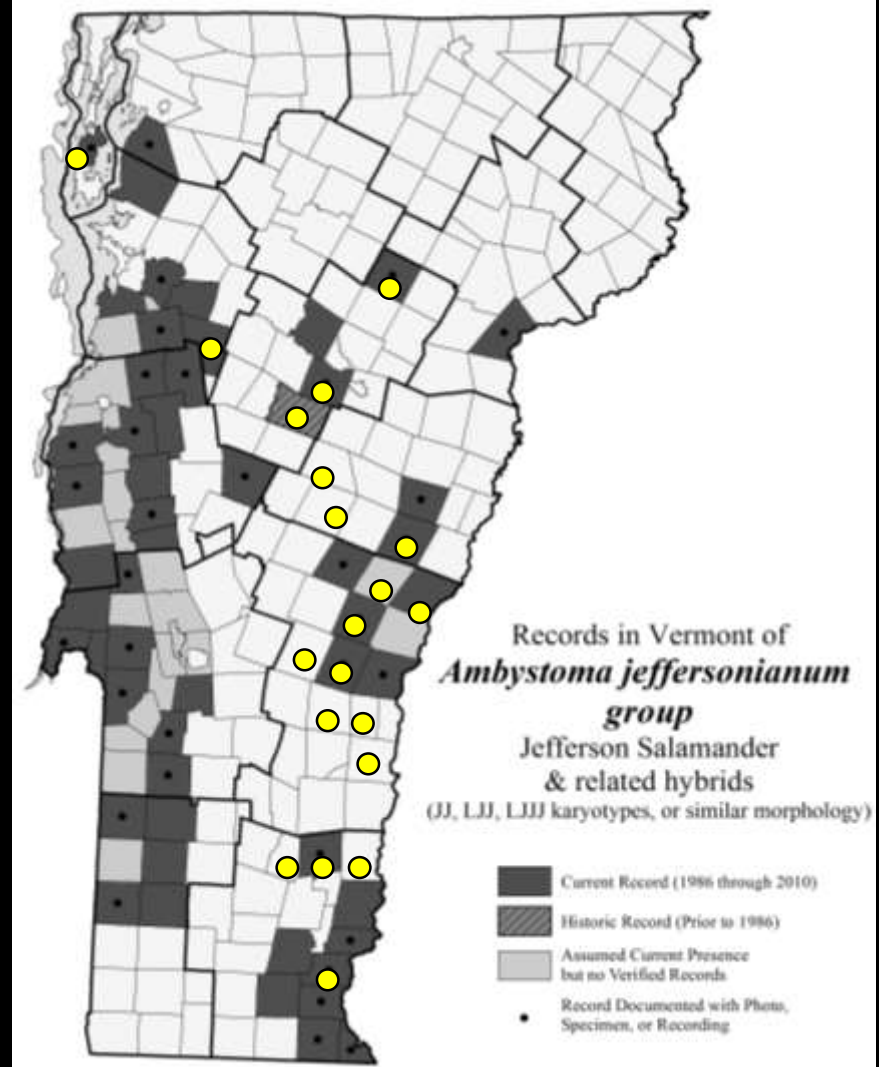
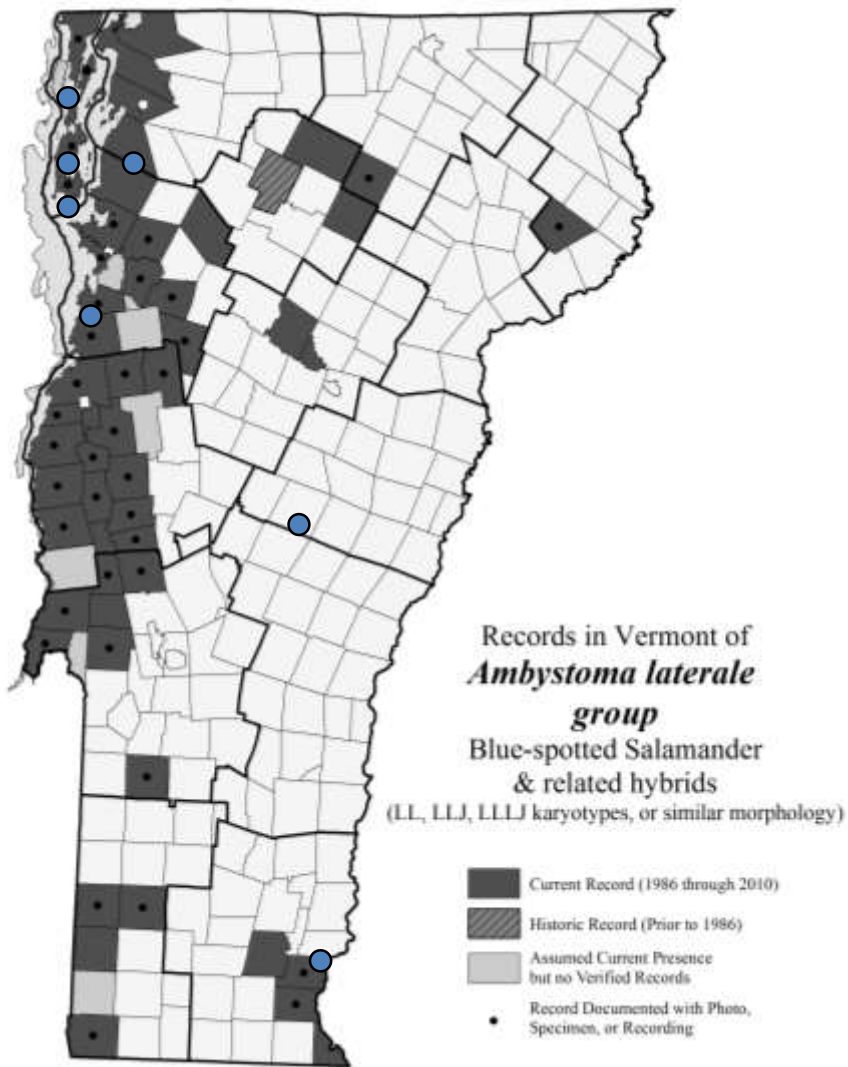


Estimated Size of Confirmed Pools



Indicator Species Presence





Volunteer Participation

- >115 volunteers participated in field verification
- Submitted data from 301 field visits
- Contributed ~\$34,000 in-kind SWG matching



2003



“You can’t conserve something if you don’t know where it is”

Robert Michael Pyle



Project Funding

Vermont Fish & Wildlife Dept. State Wildlife Grant



Davis Conservation Foundation



William P. Wharton Trust

Upper Connecticut River Mitigation and Enhancement Fund



Norcross Wildlife Foundation



Windham Foundation



Riverledge Foundation



Conservation & Research Foundation

