An introduction to

![NatureServe — A Network Connecting Science With Conservation]

Don Faber-Langendoen

Senior Ecologist, Syracuse NY

NatureServe's Strategic Framework: Three Key Goals

GOAL 1
Inform
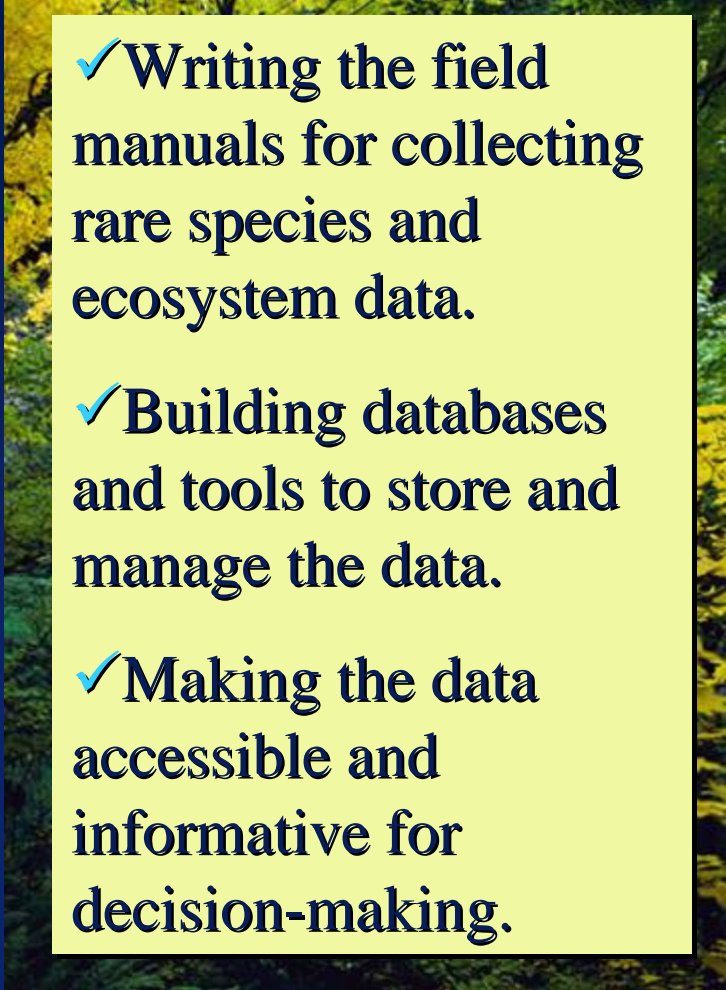Natural Resource
Decisions

GOAL 2
Advance Scientific
Understanding

Providing the scientific basis for effective conservation action.

GOAL 3
Build Conservation Capacity

NatureServe Key Activities

✓ **Establish scientific standards for biological inventory and biodiversity data management**

✓ **Develop databases for at-risk species and ecosystems (ecological communities)**

✓ **Design advanced biodiversity data management systems in partnership with information technology leaders**

✓ **Make biodiversity information accessible through the Internet, publications, and custom services to clients and partners**

✓ **Provide information products and conservation services to guide natural resource decision-making**

✓Writing the field manuals for collecting rare species and ecosystem data.

✓Building databases and tools to store and manage the data.

✓Making the data accessible and informative for decision-making.

Our Network

- ~ 75 independent centers that collect and manage data about plants, animals, and ecosystems
- **Natural heritage programs throughout United States; conservation data centers across Canada and in 10 Latin American countries and territories**
- Focus on at-risk species and ecosystems

Inventory at La Butte Creek Wildland Provincial Park, Alberta

- Most programs are state or provincial agencies; some are affiliated with universities; a few are operated by TNC.

NatureServe's Member Programs:
the Network in 2007

Puerto Rico

TVA

Navajo Nation
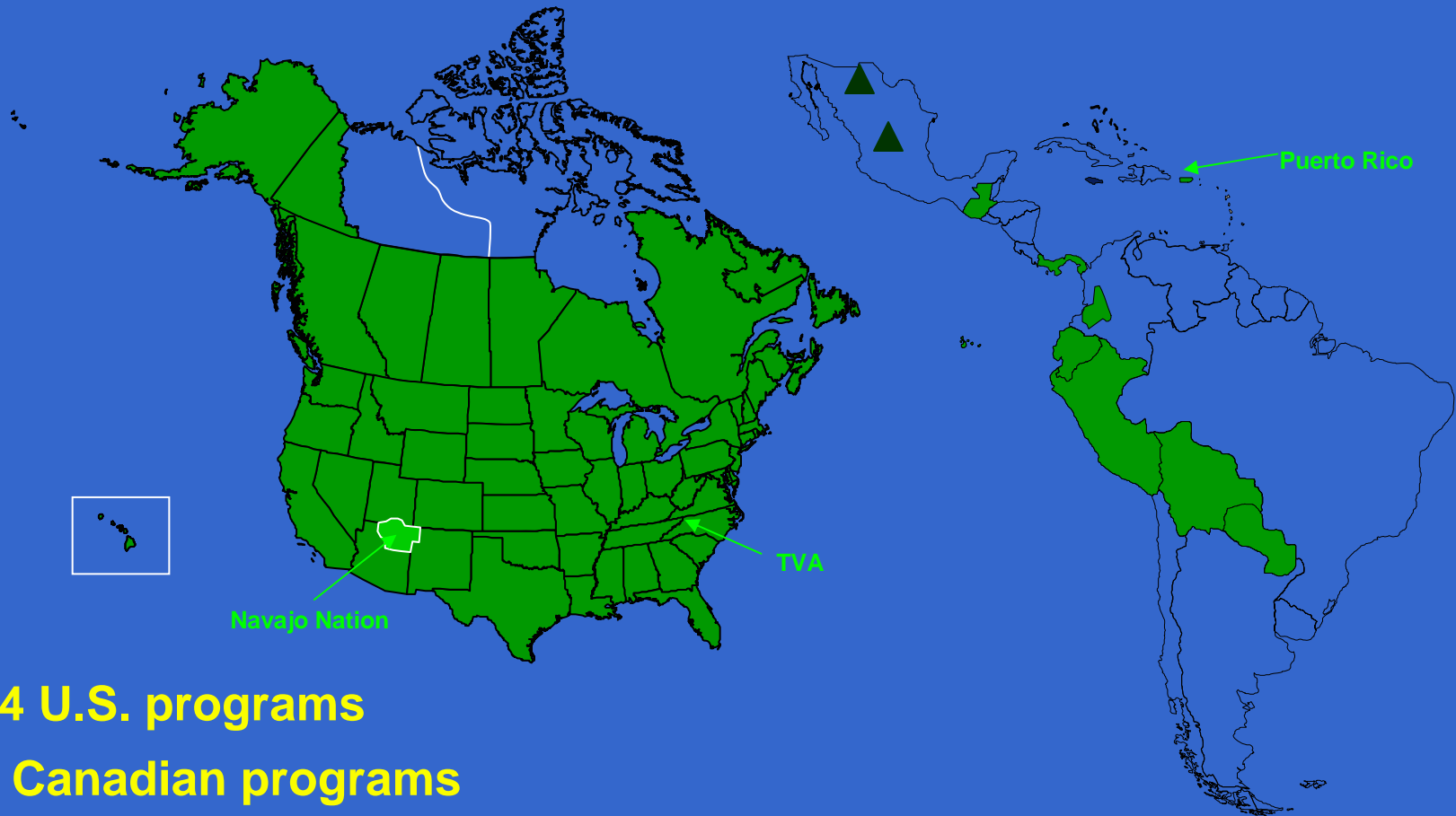
54 U.S. programs

8 Canadian programs

15 Latin American / Caribbean programs

Natural Heritage Programs and Conservation Data Centers . . .

◊ **Collect, analyze, and distribute** *detailed information* **about plants, animals, ecosystems.**

◊ **Conduct** *field inventories* **for rare and threatened species and ecosystems** *and* **high quality examples of all ecosystems.**

◊ **Track the** *distribution and conservation status* **of each species / ecosystem and the** *precise location and status* **of each population or stand.**

◊ **Conduct** *environmental reviews and assessments*

◊ **Some programs** *protect and manage* **natural areas**
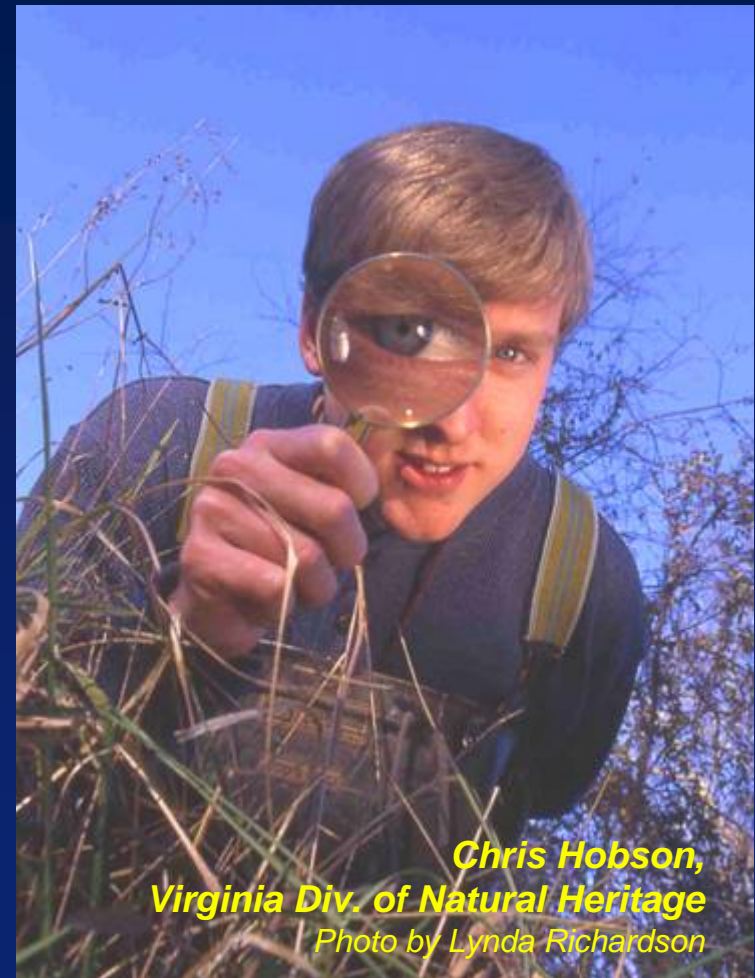
Chris Hobson,
Virginia Div. of Natural Heritage
Photo by Lynda Richardson

Ecosystems

Communities

Species

Populations

Genes

PLANTS

ANIMALS

ECOSYSTEMS

Biodiversity: Classification is Fundamental

Ecosystem Classifications
and state Heritage Programs

◊ State surveys are the primary way in which we track ecosystem occurrences on the ground.

◊ Fine-scale tracking (consensus is challenging)
  - state natural community types / associations (crosswalked to USNVC types, wherever possible)
  - Latin American partners need multi-scaled approach

◊ Higher level tracking (consensus emerging) Multi-scaled elements.
  - Ecological Systems
  - Revised (Inter) National Vegetation Classification (IVC/USNVC)

Ecological Community & Ecological Systems Classifications

USNVC

- parallel classifications
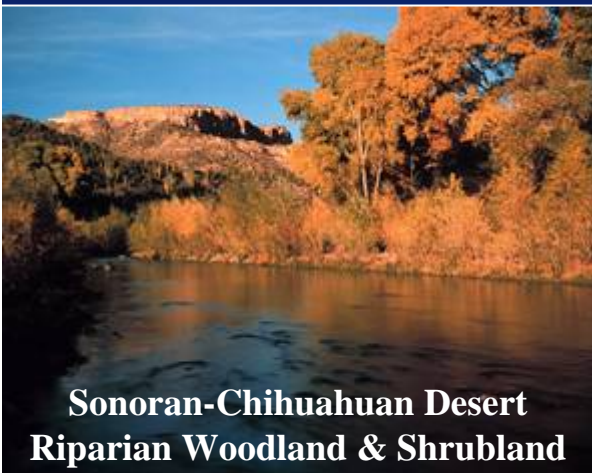- collaboration with partners
- linked together

Formation(L3)

Macrogroup(L5)

Ecological System

Alliance(L7)

Association(L8)

Ecosystems

Sonoran-Chihuahuan Desert Riparian Woodland & Shrubland

Tracking the Talk

◈ - NatureServe and the Network

◈ - The basic units of biodiversity

- Species (plants and animals)
- Ecosystems
- And a few assorted extras

- The lands that biodiversity depends on

NatureServe Conservation Status:
Global (G) Ranks: Rarity and Extinction Risk

Eastern Prairie White-Fringed Orchid, G2

GX - Extinct

GH - Possibly extinct

G1 - Critically imperiled

G2 – Imperiled

G3 - Vulnerable

·**At-Risk Elements**

G4 - Uncommon but apparently secure

G5 - Widespread, abundant and secure
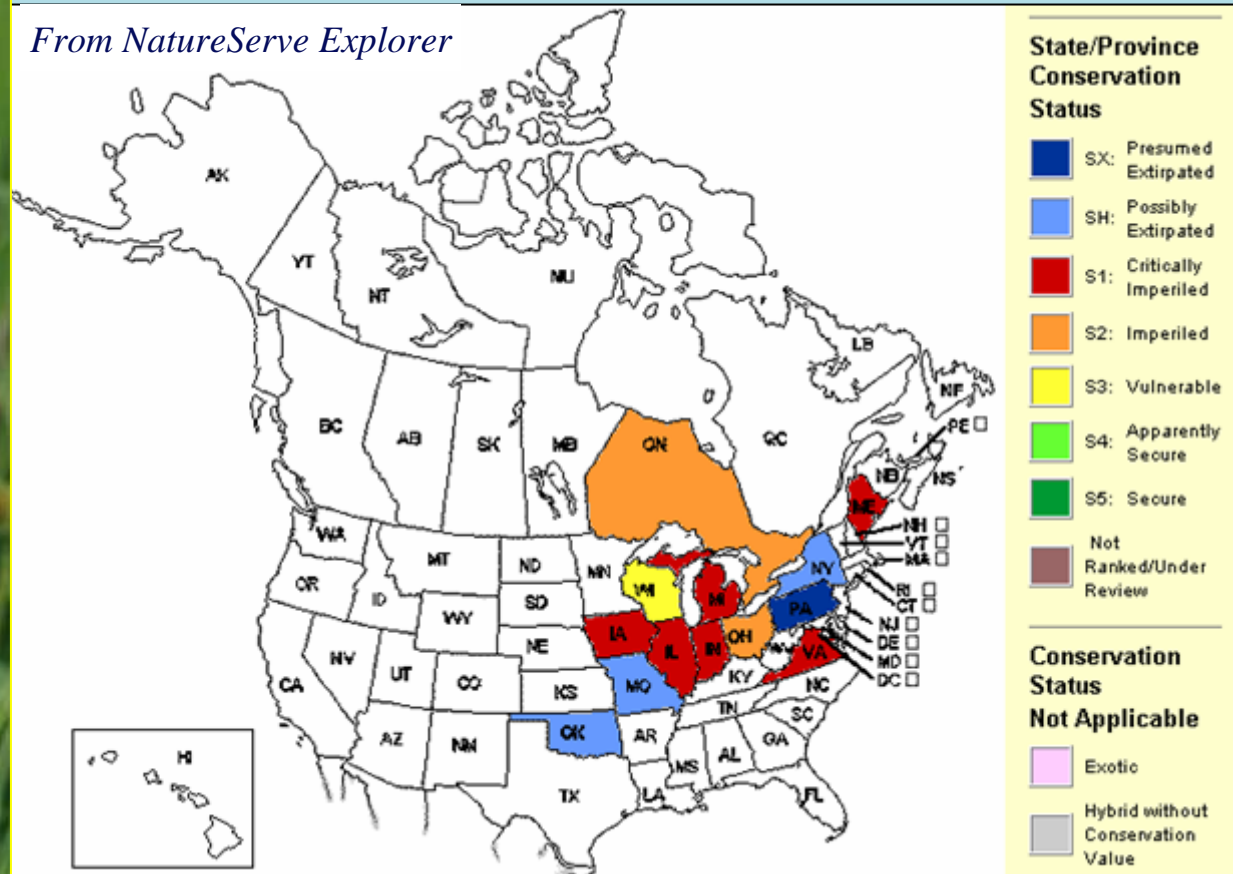

Wild Potato Vine, G5
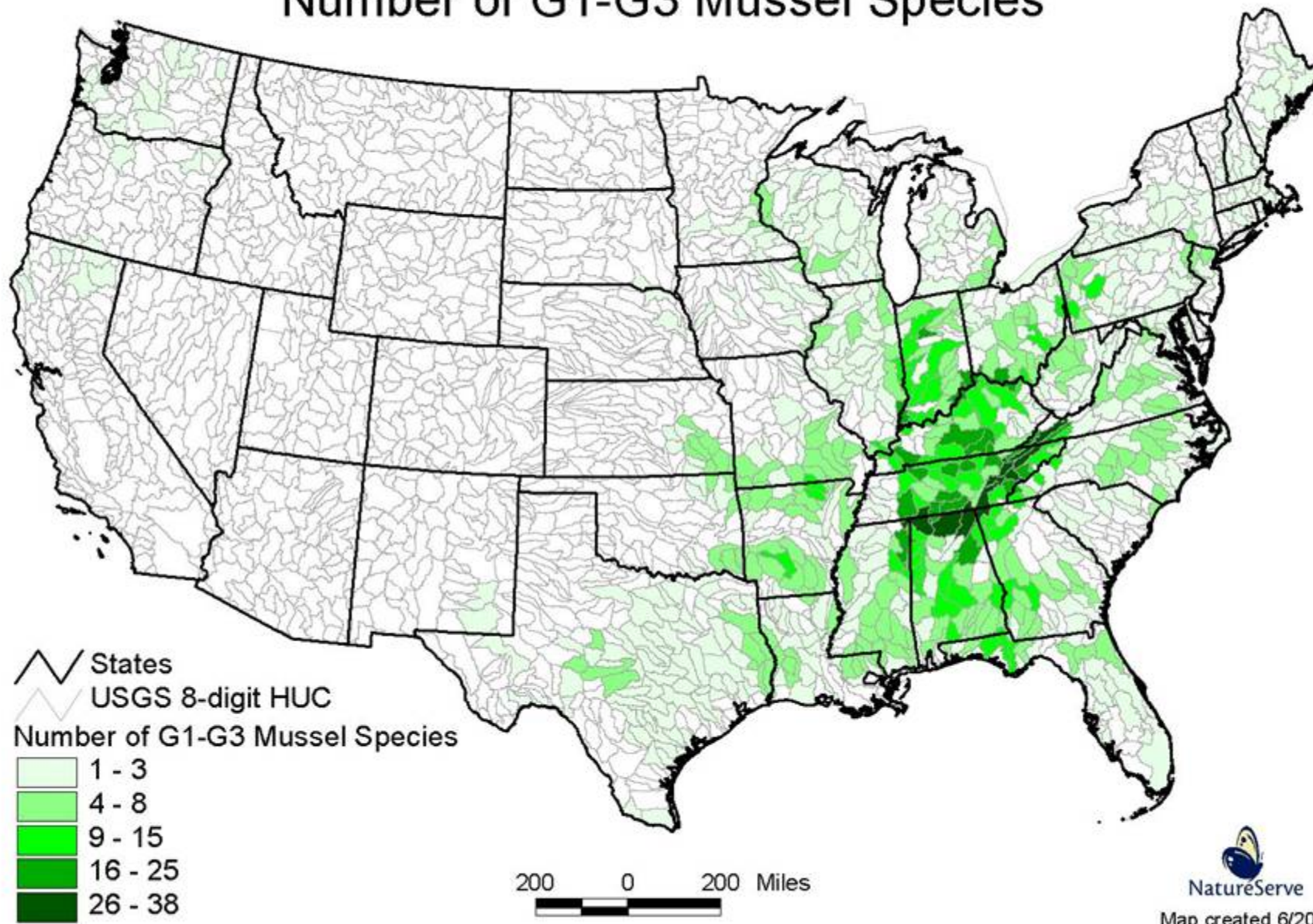
Platanthera leucophaea

Eastern prairie white-fringed orchid
G2 = Globally Imperiled

From NatureServe Explorer

Number of G1-G3 Mussel Species

Prioritizing Biodiversity Data Collection

· Gathering and maintaining data is expensive – choices need to be made about what to collect.

◊ At Risk (G1 – G3) Species and Ecosystems

◊ Exemplary occurrences of all Ecosystems

◊ Other important biodiversity features (e.g., migration stop-overs)

◊ Documentation of significant biodiversity sites (e.g., state natural areas, National Parks, representative sites in ecoregions, corridors, land trust sites)

Tracking Biodiversity on the Ground: Observations and Occurrences (EOs)

Bearded Guan
J. del Hoyo - Lynx Edic.

◊ Place-based (location-specific)
◊ Focuses on **population or natural community** as primary unit of conservation interest
◊ Defined by specifications
◊ Enables viability/integrity estimates
◊ Unbiased comparison of areas of interest
◊ Field records and plots are supporting data

Bearded guan *(Penelope barbata)*

Observations and Occurrences (EOs)

Photo: N. Cappuccino
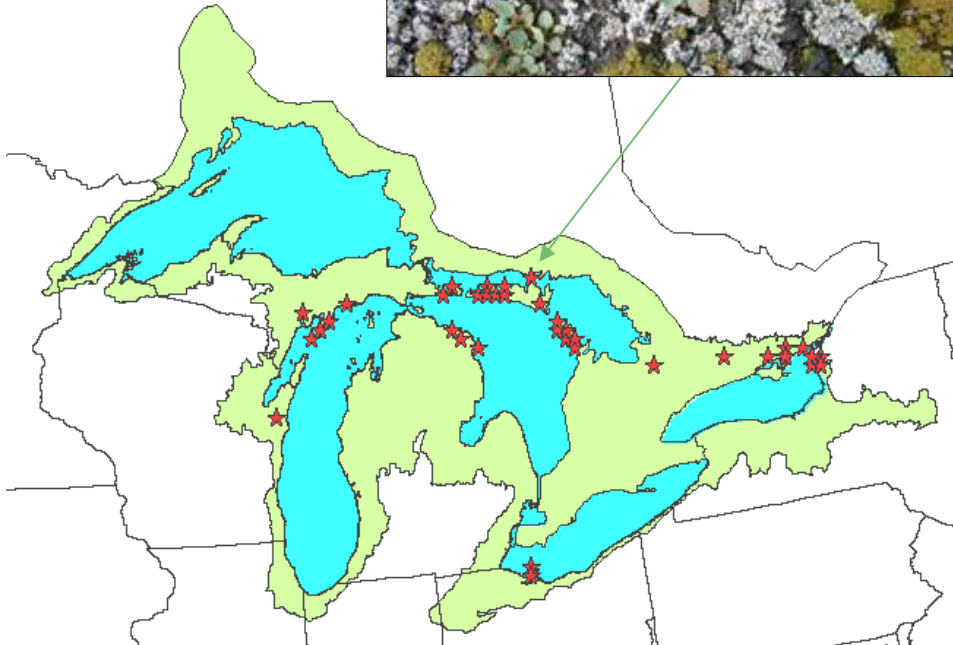
Allow us to inform local decisions and analyses in the context of regional and global considerations

Include:
◇ Location
- latitude / longitude
- topographic quad map
- watershed / cuenca

◇ Precision

◇ Condition

◇ Status

Assessing Condition of Occurrences
Viability / Integrity

◊ Provide an estimate of **current** viability (species) or ecological integrity (ecosystems): A – D scale.

◊ Help prioritize occurrences for conservation attention (inventory and monitoring)

◊ Highlight indicators to be used in management and monitoring

Assessing In   of Occurrences

Viability or Int   relative viability
or integrity of t

ECOLOGICAL INTEGRITY

Biotic Condition

·   Species Richness

·   Exotics

Abiotic Condition

·   Hydrology

·   Soils

Landscape Context

·   Fragmentation

·   Buffer Length, Width, Condition

Size

Absolute Size

Dwarf Shrub Bog

Little Cedar Pond

MEASURABLE INDICATORS
FOR DOCUMENTING CONDITION

EIA RANK	RANK FACTOR	KEY ECOLOGICAL ATTRIBUTE	INDICATOR
A B C or D	Biotic Condition	Stand Development / Maturity	e.g. coarse woody debris
		Biotic Composition	e.g. IBI/FQI
	Abiotic Condition	Ecological Processes	e.g. herbivory
		Abiotic Physical/Chemical Attributes and variability	e.g. nutrient input
	Size	Area supporting patch dynamics	e.g. minimum dynamic area
	Landscape Context	Landscape Structure	e.g. fragmentation
		Landscape Dynamics	e.g. disturbance size and return interval

Tracking the Talk

◇ – NatureServe and the Network

◇ - The basic units of biodiversity

- Species (plants and animals)
- Ecosystems

◇ - At-Risk Species and Ecosystems (the elements)

◇ -On-the-ground Data (observations / occurrences)

- Assess and Monitor their Viability / Integrity (condition)
- Identify important sites and landscapes

Why are some data sensitive?

◈ Rarity or Threat to Species / Occurrence

◈ Landowner Privacy

◈ Condition Set by Source / Provider

Make information available in a secure and responsible way

Uses of Network Data

Proactive:

- Ecoregional planning
- Resource management plans
- Industry Certification (SFI)
- Comprehensive Wildlife Conservation Strategy
- State Wildlife Action Plans (SWAP)

Sustainable Development:

- Environmental review
- Environmental Impact Statements
- Permitting and other regulatory actions


TNC Sonoran Ecoregion Plan

www.natureserve.org

NatureServe Explorer
www.natureserve.org/explorer
"An Online Encyclopedia of Life"

◊ Data on 60,000+ plants, animals, and communities/ecosystems of U.S. and Canada

◊ Searchable database - free to the public via the Internet

◊ Conservation status, distribution maps, life histories

◊ County and watershed data for U.S. at-risk species

◊ Images of thousands of species

◊ A tool for conservationists, students and teachers, academic researchers, landowners and land managers

Downloadable Data
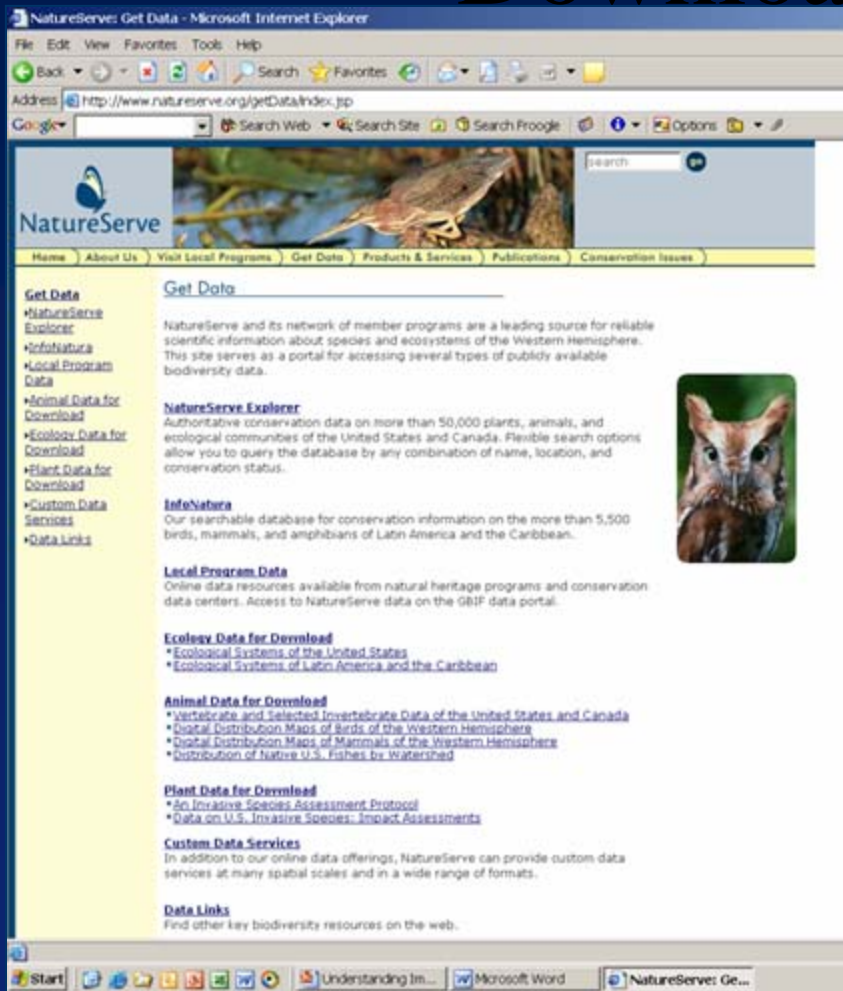
- Digital range maps for all birds and mammals (ArcView)
- Ecological systems classification (Access)
- Invasive species assessments (Excel)
- Conservation status of vertebrates and selected invertebrate groups (html or txt)
- Links to member program online data

http://www.natureserve.org/getData/index.jsp

Tracking the Talk

- ◇ NatureServe and the Network
- ◇ The basic units of biodiversity
  - Species (plants and animals)
  - Ecosystems

- ◇ At-Risk Species and Ecosystems
- ◇ On-the-ground Data (Elements and Occurrences)
  - Assess and Monitor the condition
  - Identify important sites and landscapes

- ◇ Access and Use the Data
  - Sensitive Data
  - Conservation, Resource Management, Sustainable Development
  - Website Access
  - Downloadable Data

4 Charges Per E.C.L. 11-0539

1. identify the locations and status of rare plants, rare animals, and rare ecological communities

2. develop systems for ranking state and global rarity and produce lists

3. maintain comprehensive data management systems

4. analyze and interpret information for the purpose of conserving and managing the state's biological diversity

History

1985 – Established as a partnership b/w DEC and The Nature Conservancy

1993 – Program formally recognized in the Environmental Conservation Law

Structure

Contract unit w/in Div. of Fish, Wildlife, & Marine Resources, Bureau of Habitat

Data Partners

State & Federal Agencies

Volunteer Naturalists

Research Scientists

Environmental Consultants

Conservation Groups

New York Natural Heritage Program

NY Natural Heritage biologists have assessed & inventoried hundreds of thousands of acres

(project driven, mostly non-core funds)

New York Natural Heritage Program

NY Natural Heritage currently tracks

(core and non-core funds)

434 rare animal species

737 rare plant species

3-toed Woodpecker
Rare in New York
more common to north

Sandplain Gerardia
Fewer than 10 high-quality
populations in the world

New York Natural Heritage Program

NY Natural Heritage currently tracks
174 natural community types

Deep Emergent Marsh
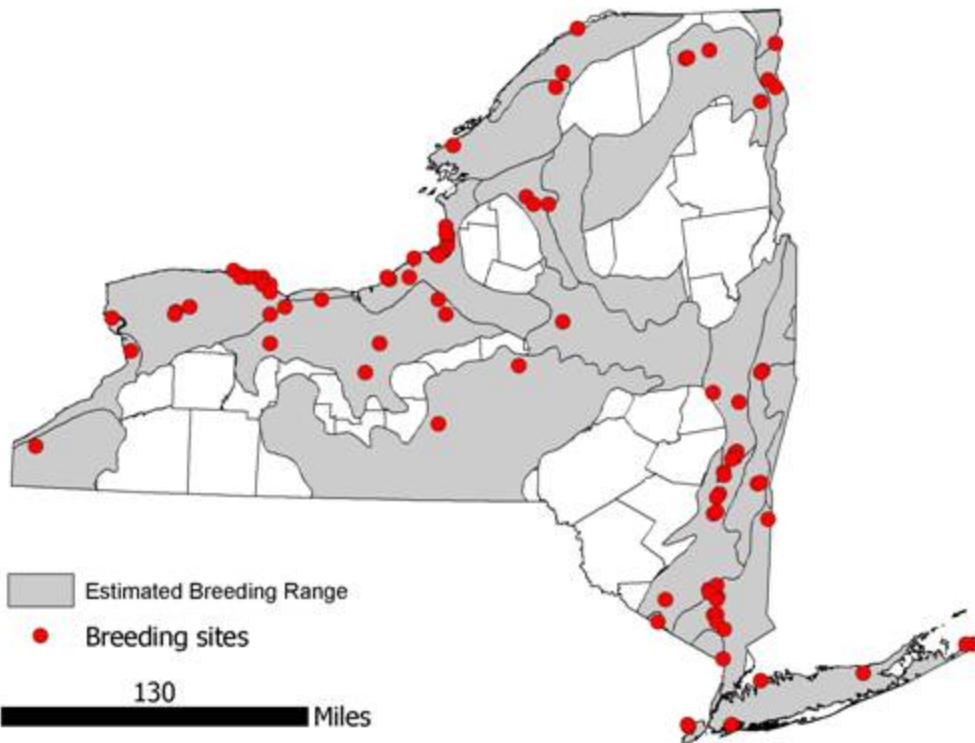common – only track the state's very best examples

Alvar Grassland
rare –track all examples b/c all are significant

New York Natural Heritage Program

The most comprehensive database on New York's imperiled biodiversity

Estimated Breeding Range
Breeding sites

130 Miles

New York Natural Heritage Program

Spatial Data – polygons
Currently: 11,500 records

Natural Heritage Program Element Occurences
- Animal Assemblage
- Community
- Invertebrate Animal
- Non-vascular Plant
- Vascular Plant
- Vertebrate Animal
- In Process

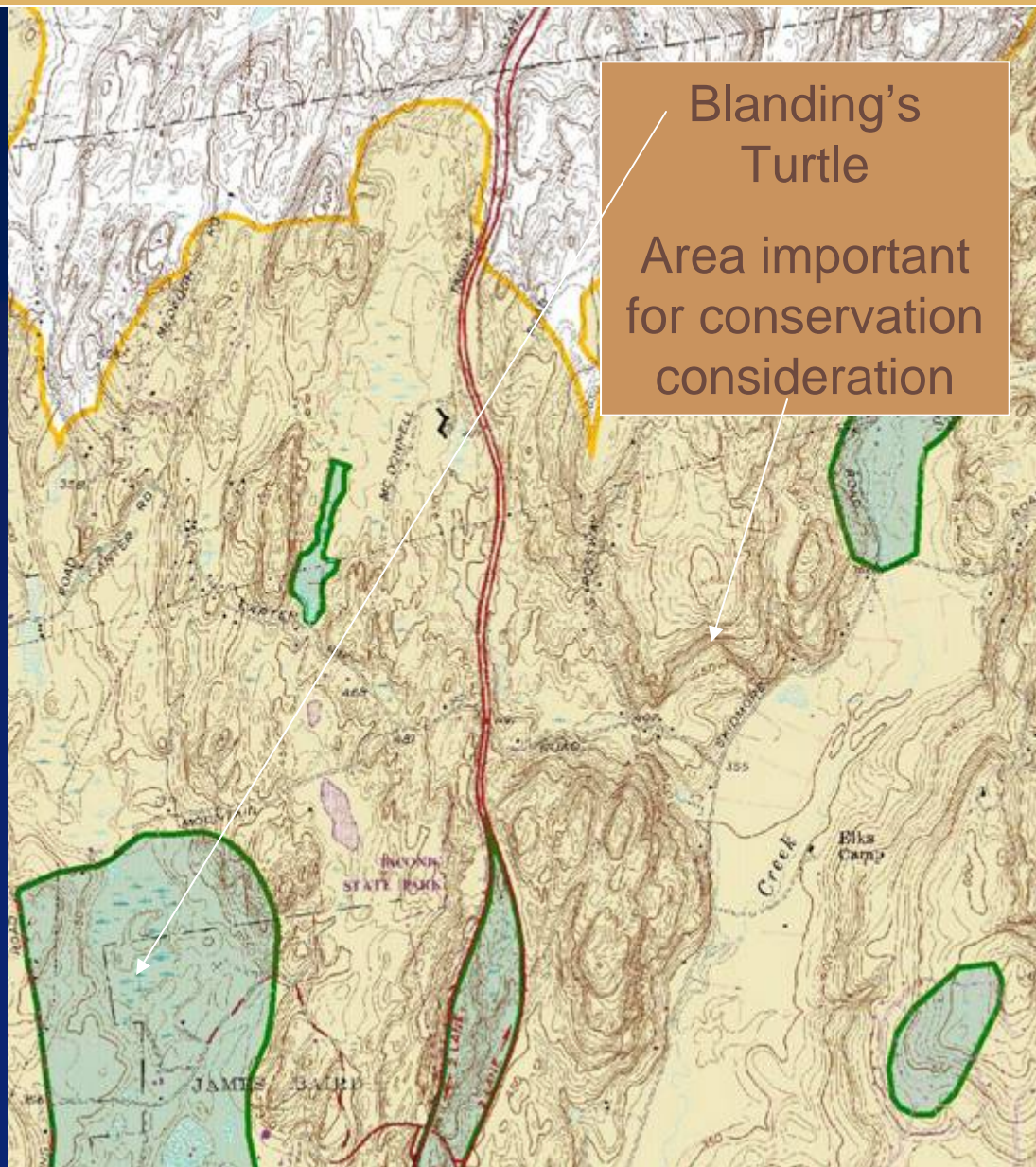0   100 Miles
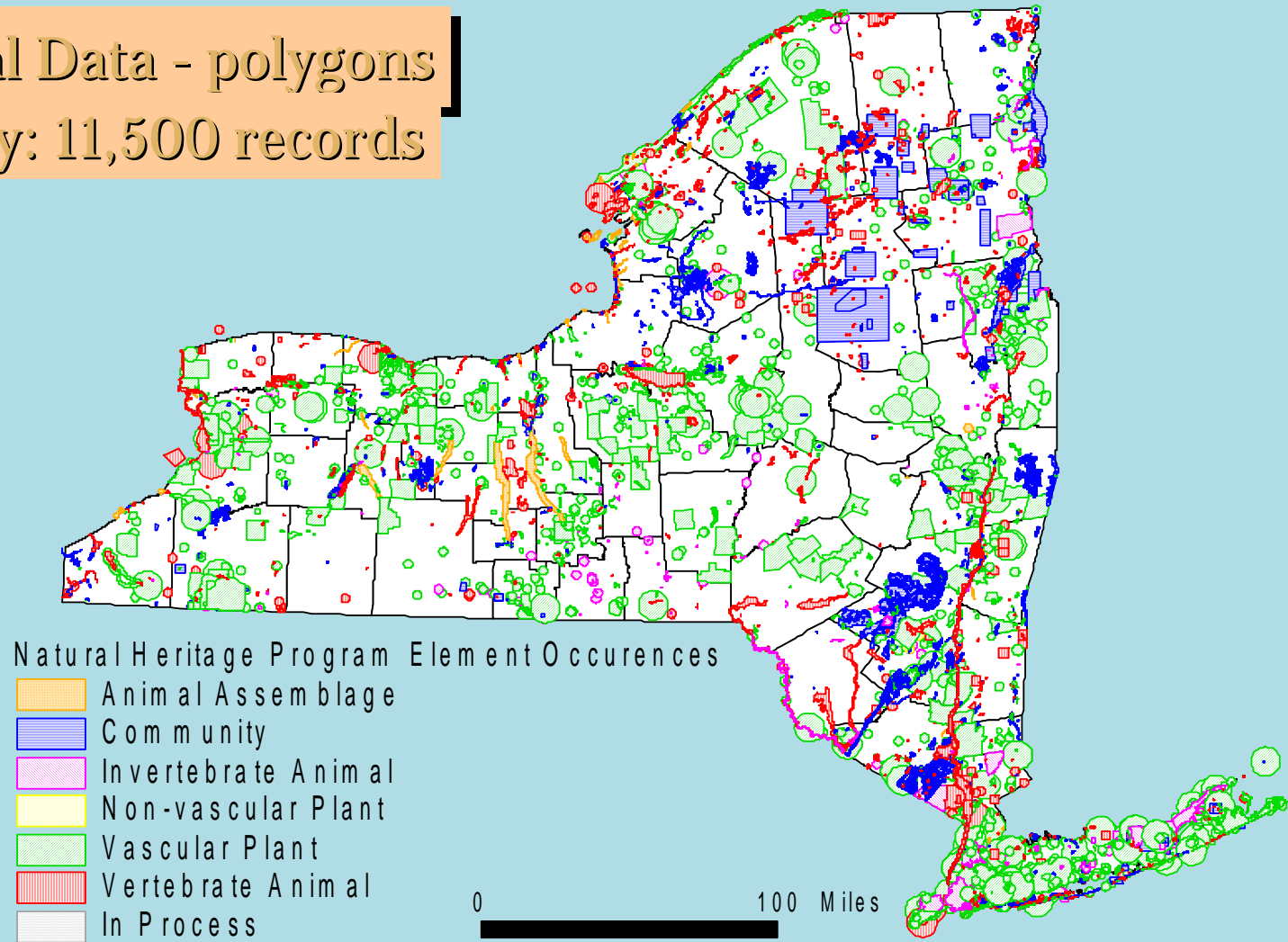
Interpreted Data Layers

Not just
"where is it?"

but also
"where do we need to work to protect it?"

"how is it doing"
(A-D viability/integrity)

"do we need to monitor it?"

Blanding's Turtle

Area important for conservation consideration

New York Natural Heritage Program

Environmental Review
(Done entirely with Core funds)

Mainly consulting firms, but DEC Regional Offices, NYS DOT, and the Adirondack Park Agency also incorporate our data into their project & site reviews

Approximately **2,000** Environmental Permit & SEQR Reviews
&
1,000 Other Requests Processed Annually

Overview: Status

New York Natural Heritage Program

Spreading Globeflower
Trollius laxus Salisb.

Family: Buttercup Family (Ranunculaceae)

State Protection: Rare
Federal Protection: Not Listed

Did you know?
The majority of the world's populations of spreading globeflower are found in central New York. Without these populations, this plant may be listed as a federally endangered/threatened species and at much greater risk to extirpation. Central New York is critical to the long-term protection of this species.

State Ranking Justification

Range:
Distribution Map, Best Places to See

Conservation Issues:
Threats, Management, Research Needs, Trends

Address http://128.213.30.24/guide.php?id=6949&part=3

New York Natural Heritage Program

HOME | ANIMAL GUIDES | PLANT GUIDES | COMMUNITY GUIDES | SEARCH GUIDES

Summary | Conservation Issues | Habitat | Range | Identification Comments | Taxonomy | Additional Resources

Short-eared Owl
Asio flammeus (Pontoppidan, 1763)   **Birds**   Printer Friendly Version

New York State Distribution

New York is the southern edge of the short-eared owl breeding range with the exception of some scattered breeding records as far south as Virginia (New York State Department of Environmental Conservation 2003). The breeding range in the state is generally limited to the St. Lawrence and Lake Champlain valleys, the Great Lakes Plains, and marshes along the south shore of Long Island. Between the fall and spring, the number of short-eared owl observations increase as northern populations migrate south (Clark 1975 cited in NatureServe 2003), possibly in search of food. Significant numbers of wintering owls are in the Finger Lakes and the Lake Ontario plains, especially in Jefferson County, at scattered locations in the Hudson Valley, and the south shore of Long Island.

Global Distribution

Breeding: In North America, short-eared owls are found from northern Alaska to northern Labrador, south to California, Utah, Colorado, Missouri, Illinois, Ohio, and Virginia. They are more numerous in western and central North America than in eastern North America. Breeding has been recorded in small numbers in every province and territory in Canada (NatureServe 2003). Currently, in the northeastern United States, nesting is known in Vermont, New York, Massachusetts, and Pennsylvania (Tate 1992 cited in NatureServe 2003). Breeding has also been documented in the Hawaiian Islands, Caroline Islands (Ponape), and Greater Antilles (Cuba, Hispaniola, Puerto Rico) (AOU 1983 cited in NatureServe 2003). In Eurasia, short-eared owls are found from Iceland, British Isles, Scandinavia, northern Russia, and northern Siberia south to southern Europe, Afghanistan, northern Mongolia, the northern Kurile Islands, and Kamchatka. Non-breeding: Outside of the breeding season, short-eared owls are more common from the southern parts of most of the Canadian provinces south to southern Baja California, southern Mexico, the Gulf Coast, and Florida. Short-eared owls reside on all the main islands of Hawaii and can be found in the Greater Antilles, but are uncommon in Puerto Rico, including Isla Culebra. In the Old World, non-breeding birds

State Distribution Map
click to enlarge

● Known Locations ■ Potential Range
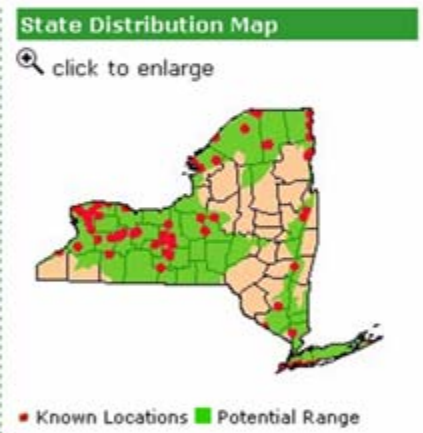
The map shows the known breeding locations for short-eared owl (red dots) based on the New York Natural Heritage Program database and the first and second New York Breeding Bird Atlas. A general approximation of the potential breeding range (shading) throughout the state is based on the US Forest Service Ecological Units (Keys et al. 1995).

Dataset Sources

Best Places to See

New York Natural Heritage Program

www.nynhp.org

Points for Discussion

How do you assess the biodiversity & conservation value of lands that a land trust may be interested in?

Identify the biodiversity elements
- at risk species and ecosystems
- high quality ecosystems
- ecosystem services

Identify who else has these elements, and how are they taking care of them
– threats
- land stewardship

Do you have time, staff, resources to sort these values out?

How can NatureServe and the Natural Heritage Network help?

Lunch time roundtable on an Encyclopedia of Biodiversity that can help meet these needs.