Institutions: Some Key Approaches, Laws and Agreements Related to Biological Conservation

- Ranking and priority setting
- ESA
- CITES
- CBD
Ranking and priority setting

NatureServe
A Network Connecting Science With Conservation
Where is it?

An Element Occurrence (EO) is an area of land and/or water in which a species population or natural community is, or was present.

- Identity
- Date
- Location
How is it doing?
NatureServe Conservation Status Ranks

GX — Extinct
GH — Possibly extinct
G1 — Critically imperiled
G2 — Imperiled
G3 — Vulnerable
G4 — Apparently secure
G5 — Widespread, abundant and secure

➢ N-rank and S-rank equivalents are used at National and Sub-national levels
<table>
<thead>
<tr>
<th>Rank</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.</td>
</tr>
<tr>
<td>S2</td>
<td>Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.</td>
</tr>
<tr>
<td>S3</td>
<td>Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.</td>
</tr>
<tr>
<td>S4</td>
<td>Apparently secure in New York State.</td>
</tr>
<tr>
<td>S5</td>
<td>Demonstrably secure in New York State.</td>
</tr>
<tr>
<td>SH</td>
<td>Historically known from New York State, but not seen in the past 15 to 20 years.</td>
</tr>
<tr>
<td>SX</td>
<td>Apparently extirpated from New York State.</td>
</tr>
<tr>
<td>SE</td>
<td>Exotic, not native to New York State.</td>
</tr>
<tr>
<td>SR</td>
<td>State report only, no verified specimens known from New York State.</td>
</tr>
<tr>
<td>SU</td>
<td>Status unknown.</td>
</tr>
</tbody>
</table>
**Examples…**

<table>
<thead>
<tr>
<th>CLASS</th>
<th>SCIENTIFIC NAME</th>
<th>COMMON NAME</th>
<th>GLOBAL RANK</th>
<th>STATE RANK</th>
<th>STATE LISTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stylommatophora</td>
<td><em>Novisuccinea chittenangoensis</em></td>
<td>Chittenango Ovate Amber Snail</td>
<td>G1</td>
<td>S1</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td><em>Haliaeetus leucocephalus</em></td>
<td>Bald Eagle</td>
<td>G5</td>
<td></td>
<td>S2</td>
</tr>
<tr>
<td></td>
<td><em>Hemileuca sp. 1</em></td>
<td>Bogbean Buckmoth</td>
<td>G1Q</td>
<td>S1</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td><em>Alasmidonta heterodon</em></td>
<td>Dwarf Wedgemussel</td>
<td>G1G2</td>
<td>S1</td>
<td>E</td>
</tr>
</tbody>
</table>
Quiz: Combinations are very informative…more NYS ranks:

<table>
<thead>
<tr>
<th>Turtles</th>
<th>Loggerhead</th>
<th>Green Turtle</th>
<th>G3</th>
<th>S1N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caretta caretta</td>
<td>Chelonia mydas</td>
<td></td>
<td>G3</td>
<td>S1N</td>
</tr>
<tr>
<td>Eretmochelys imbricata</td>
<td>Hawksbill Sea Turtle</td>
<td>G3</td>
<td>SNA</td>
<td></td>
</tr>
<tr>
<td>Lepidochelys kempii</td>
<td>Kemp’s or Atlantic Ridley</td>
<td>G1</td>
<td>S1N</td>
<td></td>
</tr>
<tr>
<td>Dermochelys coriacea</td>
<td>Leatherback</td>
<td></td>
<td>G2</td>
<td>S1N</td>
</tr>
<tr>
<td>Emydoidea blandingii</td>
<td>Blanding’s Turtle</td>
<td>G4</td>
<td>S2S3</td>
<td></td>
</tr>
<tr>
<td>Glyptemys muenlenbergii</td>
<td>Bog Turtle</td>
<td></td>
<td>G3</td>
<td>S2</td>
</tr>
<tr>
<td>Kinosternon subrubrum</td>
<td>Eastern Mud Turtle</td>
<td>G5</td>
<td>S1</td>
<td></td>
</tr>
<tr>
<td>Apalone spinifera</td>
<td>Spiny Softshell</td>
<td></td>
<td>G5</td>
<td>S2S3</td>
</tr>
</tbody>
</table>

- Which species is very endangered in the state but no priority globally?
- For which species is New York State critical to global survival?
WANTED

SIGHTINGS OR STRANDINGS OF SEA TURTLES

ESPECIALLY

THE KEMP’S RIDLEY

THIS TURTLE IS IN DANGER OF EXTINCTION

NOTE: SEA TURTLES HAVE FLIPPERS, & RANGE FROM 9 TO 48 IN IN LENGTH

PLEASE CONTACT 24 HOUR HOTLINE 516-728-8013

WARNING: SEA TURTLES ARE PROTECTED BY THE ENDANGERED SPECIES ACT, AND UNAUTHORIZED REMOVAL OR HANDLING IS PUNISHABLE UNDER THIS LAW.

Kemp's Ridley Sea Turtle Range

Note: Map represents approximate range of species, islands, and offshore locations are approximate.
IUCN Red List Unit

• Management of the IUCN Red List (database, web site)
• Assessment review
• Petitions and enquiries
• Training workshops
• Assessment workshops
• Other projects and Red List tools
  – Red List Index
  – Global Species Assessments
  – Regional assessment initiatives
  – Climate change and extinction risk assessment
International Union for Conservation of Nature (IUCN)

IUCN Secretariat
1,100 staff in 62 countries, led by IUCN’s Director General

IUCN Members
- 80 States
- 112 Government agencies
- >800 NGOs

Commissions
(10,000 scientists & experts)
- Commission on Ecosystem Management
- CEC (Commissions on Education and Communication)
- WCPA (World Commission on Protected Areas)
- SSC (Species Survival Commission)
The IUCN Categories

- Extinct (EX)
- Extinct in the Wild (EW)
- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near Threatened (NT)
- Least Concern (LC)
- Data Deficient (DD)

Rabb’s Fringe-limbed Treefrog

*Ecnomiohyla rabborum*
By site, country, region, globe…
U.S. Endangered Species Act of 1973 (ESA)

- The most far-reaching wildlife statute ever adopted by any nation
- Recognizes that species are of "aesthetic, ecological, educational, historical, recreational and scientific value to the nation and its people."
- Purpose is to bring about the recovery of endangered and threatened species, *whatever the cost*
Delmarva Fox Squirrel No Longer Endangered

- Subspecies of fox squirrel
- Listed since 1967
- Harvesting, agriculture, development, and hunting
- 30,000 by 2016
  - 30% of peninsula
- Delisted!
The ESA (as amended in reauthorizations) requires:

- Secretary of the Interior (via U.S.F.W.S.)
  - National Marine Fisheries Service for marine species

- Identifies and publishes lists of species that are:
  - *endangered* (in imminent danger of going extinct) or
  - *threatened* (likely to become endangered in the foreseeable future).
Listing

- Starts with petitions to list, delist, or reclassify a species
- Includes invertebrates and plants
- Biological evidence only -- economic factors are not relevant
- Anybody who can provide adequate evidence can make a proposal for listing
  - USFWS decides if a proposed species is indeed a candidate for listing
  - Secretary Interior makes the final decision
“ESA”? What exactly can be protected?

- Originally only named species and subspecies.
- Now can list reproductively isolated “distinct population segments” or “evolutionarily significant units (ESUs)"
  - If they represent enough evolutionarily significant genetic diversity to make all of the segments worth preserving.
  - E.g., anadromous fish populations, each associated with a specific river to which they return to spawn
Endangered “species” clustered in subset of counties

Source: Precious Heritage: The Status of Biodiversity in the United States
Piping plover (Atlantic DPS) United States

Whooping crane Wild Birds

Center for Biological Diversity
Waiting to board the ark: a backlog of “candidates” = biologically warranted but unfunded
Issues of “Take”

- Listed species cannot be “taken.”
- "Take" means harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect.
- Take is illegal even on private land
- In the case of plants, the ESA prohibits taking of endangered species only if it is prohibited by state law, and it often is not -- a major weakness of the act.

There have been 6 eagle shootings in northeastern Washington reported to the Fish and Wildlife Service since January of 2002, with two resulting in fatal injuries.
Other aspects

- A recovery plan must be developed
- Recovery team appointed
- Recovery must be monitored
- Status reviewed - re-listed? De-listed?

Puerto Rican parrot recovery team composed of the U.S. Fish and Wildlife Service and the Puerto Rico Department of Natural and Environmental Resources
ESA “consultations”

- Federal agencies, through their own actions or actions funded or permitted by them, must not jeopardize the continued existence of an endangered species or its habitat.

- Required to consult with U.S. Fish and Wildlife or NMFS over ways to avoid jeopardizing endangered species affected
ESA & Private Lands

- Listing can be accompanied by the designation of critical habitat, which may not be destroyed.
- Can be private property
- Economic factors may be considered when designating critical habitat.
- A huge flashpoint!
- And can take years to designate:

“The highest level of assurance that a property owner will not face an E.S.A. issue is to maintain the property in a condition such that protected species cannot occupy the property.”
Critical habitat...
Problems with ESA: Narrow Focus

- The number of endangered species is too large for them to be successfully dealt with one at a time.
- Amount needed annually for recovery of all listed species about = 8x the amount that USFWS has in its entire budget
Taxonomic skew of ESA

- Act has been used primarily to protect the charismatic megafauna
  - And mostly populations or subspecies
- Over half of the dollars spent recently were used on 1% of listed taxa
  - all seven were subspecies or populations.
- 270 plants and 9 invertebrates together received 5% of total funding!

- Flawed, but still the best we have…
ESA has *International Dimensions*

- US *and* Foreign species!
- Foreign species included on list to prevent the importation to U.S. from contributing to the extinction of species outside our borders
- The species or its products cannot be exported or imported
- Implements CITES for US...
CITES is administered through the United Nations Environment Programme (UNEP). A Secretariat, located in Geneva, Switzerland, oversees the treaty. The Secretariat:

1. Provides Parties with trade information and technical support
2. Acts as a liaison among Parties
3. Contracts trade studies
4. Informs governments and the public about CITES wildlife trade developments
5. Investigates possible CITES violations and trade threats to wildlife
6. Organizes meetings of the Conference of the Parties

Convention on International Trade in Endangered Species of Wild Fauna and Flora
Animal smuggling has lighter penalties and bigger profits than drugs and weapons...often mixed together
Trade routes for large-scale (>500kg) seizures of ivory, 2000 - 2008 (ETIS, 03 November 2013). Note: The insert map of Asia is at a larger scale than the rest of the map; most trade from CG, CM, GH, KE, MZ, NG, TZ and ZA is by sea even if directional arrows cross landmasses.

Trade routes for large-scale (>500kg) seizures of ivory, 2009 - 2011 (ETIS, 03 November 2013). Note: The insert map of Asia is at a larger scale than the rest of the map; most trade from KE, NG, TZ and ZA is by sea even if directional arrows cross landmasses.

Trade routes for large-scale (>500kg) seizures of ivory, 2012 - 2013 (ETIS, 03 November 2013) Note: The insert map of Asia is at a larger scale than the rest of the map; most trade from CI, KE, MZ, NG, TG, TZ and ZA is by sea even if directional arrows cross landmasses.

Adapted from a recent CITES report (url: goo.gl/rg37au) by ScienceLink
Treaties are not laws...

- International treaties do not have enforcement powers
- Implemented when a signatory nation passes laws making it a criminal act to violate the treaty
- In U.S. the ESA allows the Secretary of the Interior, through the U.S.F.W.S., to exercise control over trade in wildlife
In 1975 the U.S. along with nine other countries, signed the CITES treaty

Now involves 183 countries

Three important appendices that are periodically revised:
Appendix I

- All species that are threatened with extinction.
- **All commercial trade is banned**
- Noncommercial trade allowed if it does not jeopardize the species' survival in the wild.
- Permits are required for the exportation and importation of Appendix I species.
- Examples: …great apes, great whales, African elephant, all rhinoceros species, all tiger subspecies, large cats, many parrots, all sea turtles, most crocodilians, several orchids, cacti and cycads
Please fill out the following form. You can save data typed into this form.

Department of the Interior
U.S. Fish and Wildlife Service

Federal Fish and Wildlife Permit Application Form

Return to: Division of Management Authority (DMA)
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive, Room 212
Arlington, VA 22203
1-800-358-2104 or 703-358-2104

Type of Activity:
Export of skins/products of 7 native species: bobcat, lynx, river otter, Alaskan brown bear, Alaskan black bear, Alaskan gray wolf, and American alligator (CITES)

Expires 11/30/2010
OMB No. 1018-0093

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details. See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual

<table>
<thead>
<tr>
<th>1.a. Last name</th>
<th>1.b. First name</th>
<th>1.c. Middle name or initial</th>
<th>1.d. Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Date of birth (mm/dd/yyyy)</td>
<td>3. Social Security No</td>
<td>4. Occupation</td>
<td>5. Affiliation/Doing business as (see instructions)</td>
</tr>
</tbody>
</table>
Appendix II

- A longer list of species, not now threatened with extinction, but for which uncontrolled commercial trade would be detrimental.

- *Trade strictly regulated through the use of export permits.*

- Examples: great white shark, the American black bear, Hartmann's mountain, green iguana, queen conch, Emperor scorpion, bigleaf mahogan, and lignum vitae "ironwood".
Appendix III

- Includes species where there is some question as to the potential negative impact of commercial trade.

- *Permits are used only to monitor trade in these species*

- Examples...two-toed sloth by Costa Rica, African civet by Botswana, and the alligator snapping turtle by the USA
Politics

- Any listing of a species in either Appendix I or II requires approval by two-thirds of the CITES party countries.

- Any Convention member may place a native species on Appendix III.
CITES 2013

1. Bangkok
2. A total of approximately 2,234 participants including Parties, observers, media and visitors.
3. 1,150 delegates from 170 Parties
4. 14 observers from non-Parties
5. 84 participants from 21 IGOs (FAO, INTERPOL, UNDP, UNEP, UNCTAD, WORLD BANK, etc.)
6. 201 participants from 44 international NGOs
7. 215 participants from 123 national NGOs
8. 53 participants from 37 organizations from the Private Sector
9. 438 media representatives.
10. Some landmark decisions …
Sharks and manta rays

- Hugely controversial
- Listed five commercially valuable shark species in Appendix II.
  - The oceanic whitetip (*Carcharhinus longimanus*), scalloped hammerhead (*Sphyrrma lewini*), great hammerhead shark (*Sphyrrna mokarran*), smooth hammerhead shark (*Sphyrrna zigaena*) and the porbeagle shark (*Lamna nasus*).
- Now traded with CITES permits and evidence will have to be provided that they are harvested sustainably and legally.
- Also manta rays
US petition

- Include spotted and Blandings turtle on Appendix II
- Adopted!
Bobcats

- A U.S. proposal to delist the bobcat (Appendix II)

Global concerns:
- World fur demand high – all wild cats listed to avoid confusion
- Delisting would affect critically endangered Iberian lynx and Eurasian lynx

US perspective:
- Bobcat leading felid in the skin trade
- Well-managed by state authorities.
- Does not meet the biological criteria for CITES listing
- CAN reliably distinguish bobcat skins from other species to prevent illegal trade

Still remains rejected (4th attempt)
Convention on Biological Diversity (CBD)
Objectives

- Conservation of biological diversity
- Sustainable use of the components of biological diversity
- Fair and equitable sharing of the benefits arising out of the utilization of genetic resources
- Est. 1992
Cross-Cutting Issues

- Access to genetic resources and benefit-sharing
- *Bio-safety as it relates to GMOs*
- Alien species
- Traditional knowledge, innovations and practices
- Biological diversity and tourism
- Climate change and biological diversity
- Indicators
- Public education and awareness
- Economics, trade and incentive measures
- Ecosystem approach
- Global taxonomy initiative
- Protected areas
- Sustainable use of biodiversity
- Technology transfer and cooperation

- *issues that US cannot abide by*
The governing body of the Convention is the Conference of the Parties (193 Parties)

USA is NOT a party (only UN member not to)

Meets every 2 years

Parties must generate reports and strategies for implementation

Keep under review the implementation of the Convention and to steer its development

Other important functions of the COP include:
- adoption of the budget,
- the consideration of national reports,
- the adoption of protocols or annexes
- guidance to the financial mechanism
CBD Financial Mechanism: The Global Environment Facility (GEF)

- Many countries (including US) contribute to GEF
- GEF guided by COP on priorities
- Projects of the GEF undertaken by Parties to the Convention
- Many undertaken NGOs via contracts.
  - arid and semi-arid ecosystems
  - coastal, marine, and freshwater ecosystems
  - forest ecosystems
  - mountain ecosystems
  - Conservation and Sustainable Use of Biological Diversity
    Important to Agriculture
EFB 413: Introduction to Conservation Biology

"The applied science of maintaining the earth's biological diversity"
**Figure 13**

World Population: Past and Projected

- **Past**
- **Projected**

Source: Data from UN Long-Range Projections, 1998.
Stay involved: join the Society for Conservation Biology

http://www.conbio.org/
Exam III

- Exam III during exam week:
- THUR 5/4 8:00am-10:00am 5 ILLICK
  - Chapters Chap 5 Processes that Diminish Genetic Diversity pg 99-105
  - Chaps 11-17
  - 150 pages of text
  - *Somewhat more emphasis on the text*
- Composite Quizzes 8, 9, 10:
  - Listen to Radiolab segment
  - Answer form on website
  - Assignment due last day of class or exam III