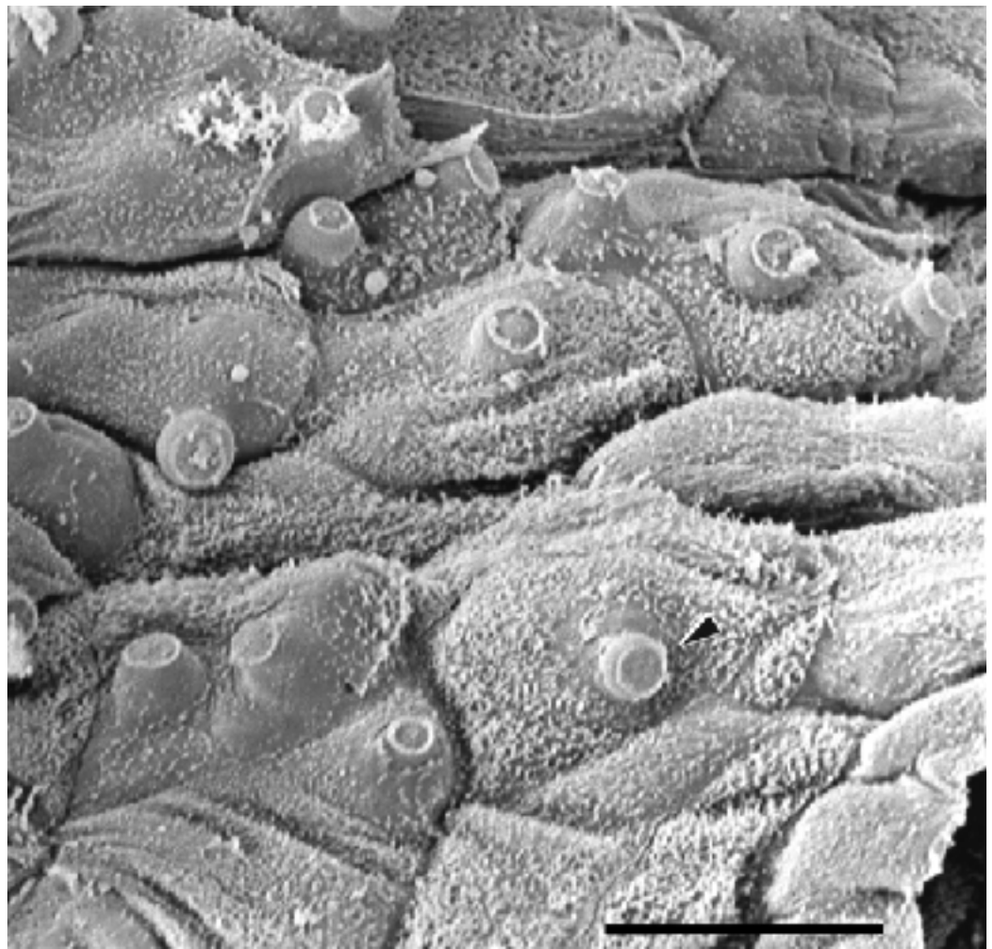
Presentation Guidelines

- 12 minute PowerPoint, leaving 3 minutes to answer questions
- Between 8-15 slides, but there is no slide requirement
- Presentations will be graded by….
    - Content
        - Follow the format: introduction, methods, results, discussion
        - Did you ensure to include all the important results from your research paper?
    - Quality
        - Did you clearly spend time formatting your presentation in a compelling way?
            - No “walls of text”
            - Abundance of visual aides
            - Effective use of pictures
    - Clarity
        - Did you present your project in a way that was easy to follow and compelling?
        - Did you (and your partner) speak clearly and communicate effectively?

Conservation



Conservation

- Species conservation is not that simple
  - What is a species?
  - Do we know what the causes of decline are?
  - What is the appropriate approach?
  - Do we prioritize who we try to save?
  - Is it even feasible?

Levels of Protection

- International
  - International Union for Conservation of Nature
    - IUCN
  - Conservation on International Trade in Endangered Species
- CITES
  - CITES I: No trade of any kind
  - CITES II: Captive bred specimens may be traded. Individuals already in a country may be traded.
  - CITES III: Some regulation of trade.

Levels of Protection

- Federal
  - US Fish and Wildlife and NOAA
    - Endangered Species Act (1973)
      - Set the language we use today.
- Lacey Act
  - Initially regulated hunting activity
  - Now mostly used to prevent invasions by non-native species

Levels of Protection

- State
  - Many states have their own protection rules, usually operating under the guidance of federal policies
  - CT: Department of Energy and Environmental Protection (DEEP) is primarily responsible for conservation

Levels of Protection

- Non-governmental Organizations
  - NGOs
  - Many you know by name
  - Act through lobbying, fundraising, buying land

WWF®

GREENPEACE

Audubon

SIERRA CLUB
FOUNDED 1892

How do species become imperiled?

- Overharvest
- Habitat Loss
- Resource Loss
- Collateral Damage

Overharvesting

- Overharvesting refers to any type of “take”.
  - Food
  - Pet trade
  - Byproducts
- Fisheries are the classic example

Overharvested Herps

- Turtles
  - Food in many cultures, both the eggs and adults
  - Pet Trade
- Rattlesnakes
  - “Rattlesnake Roundups”
  - Food
- Alligators
  - Food
  - Nuisance

Habitat Loss

- Habitat loss is likely the single biggest contributor to the decline of reptiles and amphibians

- As we have seen, many reptiles and amphibians are very specialized when it comes to where they live, eat, and breed

Habitat Loss

- In CT, ***Crotalus***, ***Agkistrodon***, ***Heterodon***, ***Glyptemys***, ***Terrapene*** have all been strongly affected by habitat loss

- Typically, these environments are also particularly good building sites or contain some resource of value to people.

Habitat Loss

- In addition to particular habitat type, size of habitat is important
  - Many reptiles have large home ranges

- Connections between living and breeding sites can also be ruined
  - Turtles especially

Resource Loss

- Typically food
- Some of our species are pretty specialized on food types
- *Nerodia*, *Heterodon*

Collateral Damage

- Interdependence of species isn't often realized until you start to lose one
- These are known as "keystone species"
- Example: Gopher tortoises and the indigo snake

Enough with the problems

- What are potential solutions?
  - Each problem has a different solution.
- Some problems seem obvious
  - Overharvesting? Stop f!@#ing killing it!

Overharvesting

- If it's commercially viable, how do you shut down an entire industry?
  - Raise the species on farm / in captivity
  - Regulate harvesting

Captive Breeding Programs

- Many zoos and facilities are interested in the captive breeding of endangered organisms
    - Panamanian Golden Frogs
    - Komodo Dragons
    - Hellbenders

Habitat Loss

- Can you restore the habitat to its prior condition?
  - Is this necessary?
- Are there ways to allow for the species to coexist with people?

Habitat Loss

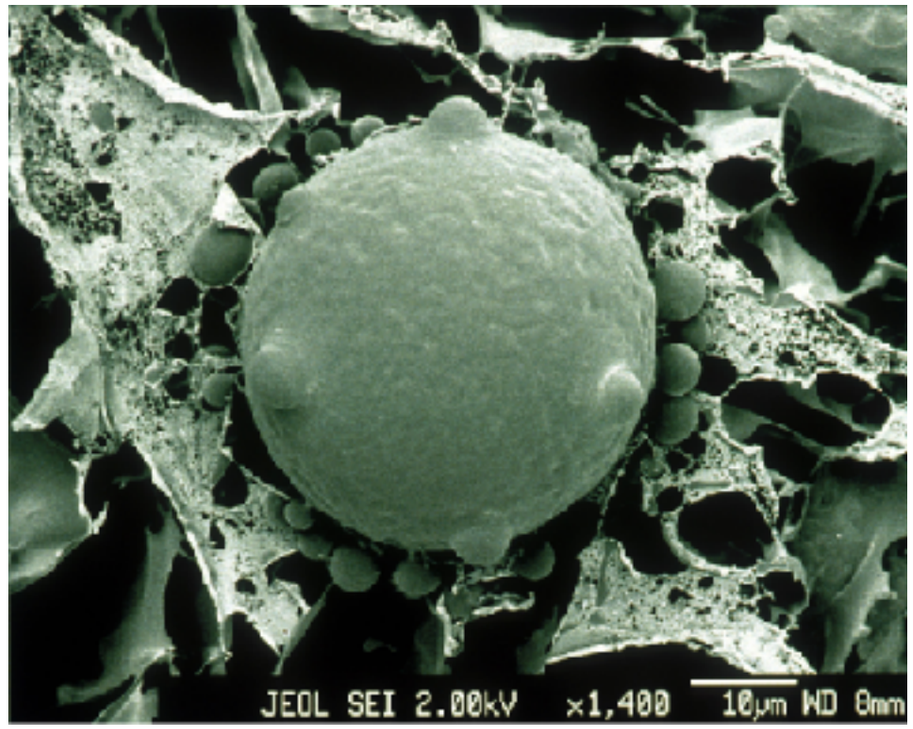
- Wildlife Sanctuaries
- National Parks
- Arboretums
- Wildlife bridges

Resource Loss

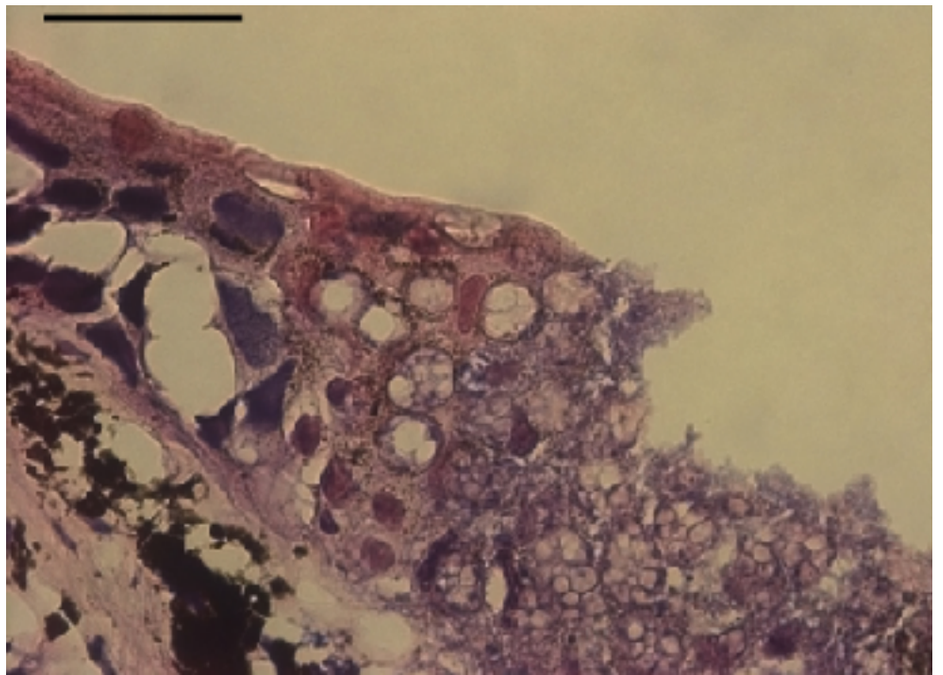
- Often, this is byproduct of not knowing enough
  - When we drain a pond for a building, how many species (especially those not actually in the pond) rely on that water source?
  - Mitigating these effects can be difficult at best

Special Topic: Amphibian Chytrid Fungi

- *Batrachochytrium dendrobatidis* or “Bd”
- *Batrachochytrium salamandrivorans* or “Bsal”

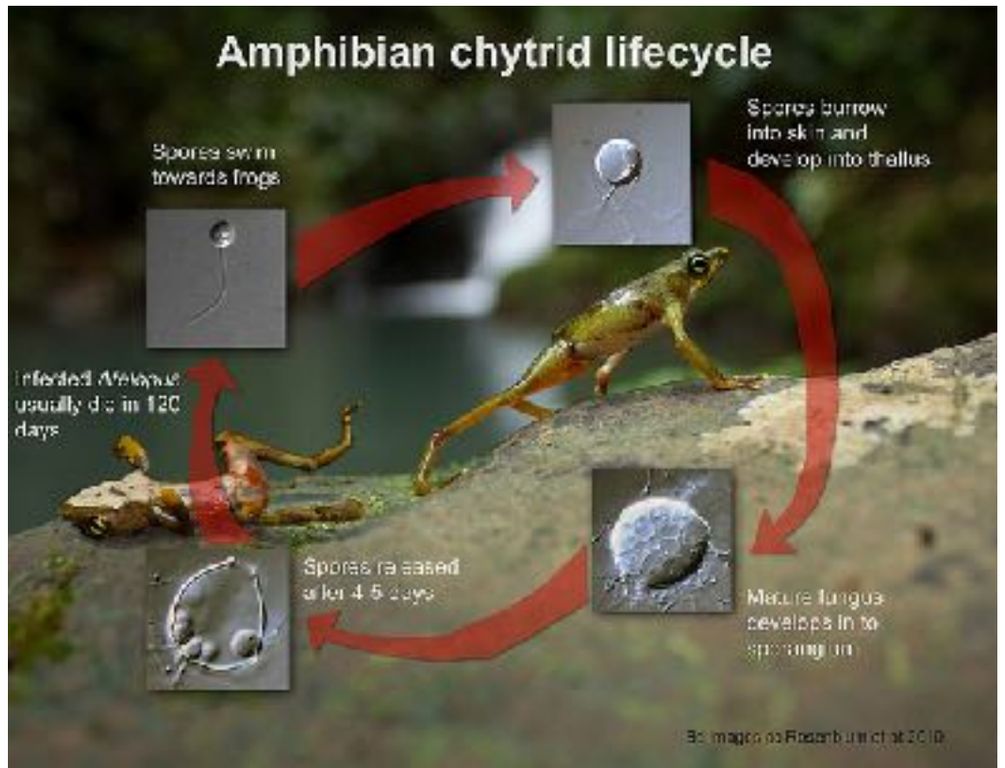


- The ONLY TWO chytrid fungus that affects vertebrates
- Unusual and very primitive fungus type
- First identified in Australia and South American in 1998 after massive die offs
- Probably originated in Africa, and spread via pet shop and lab *Xenopus* shipments



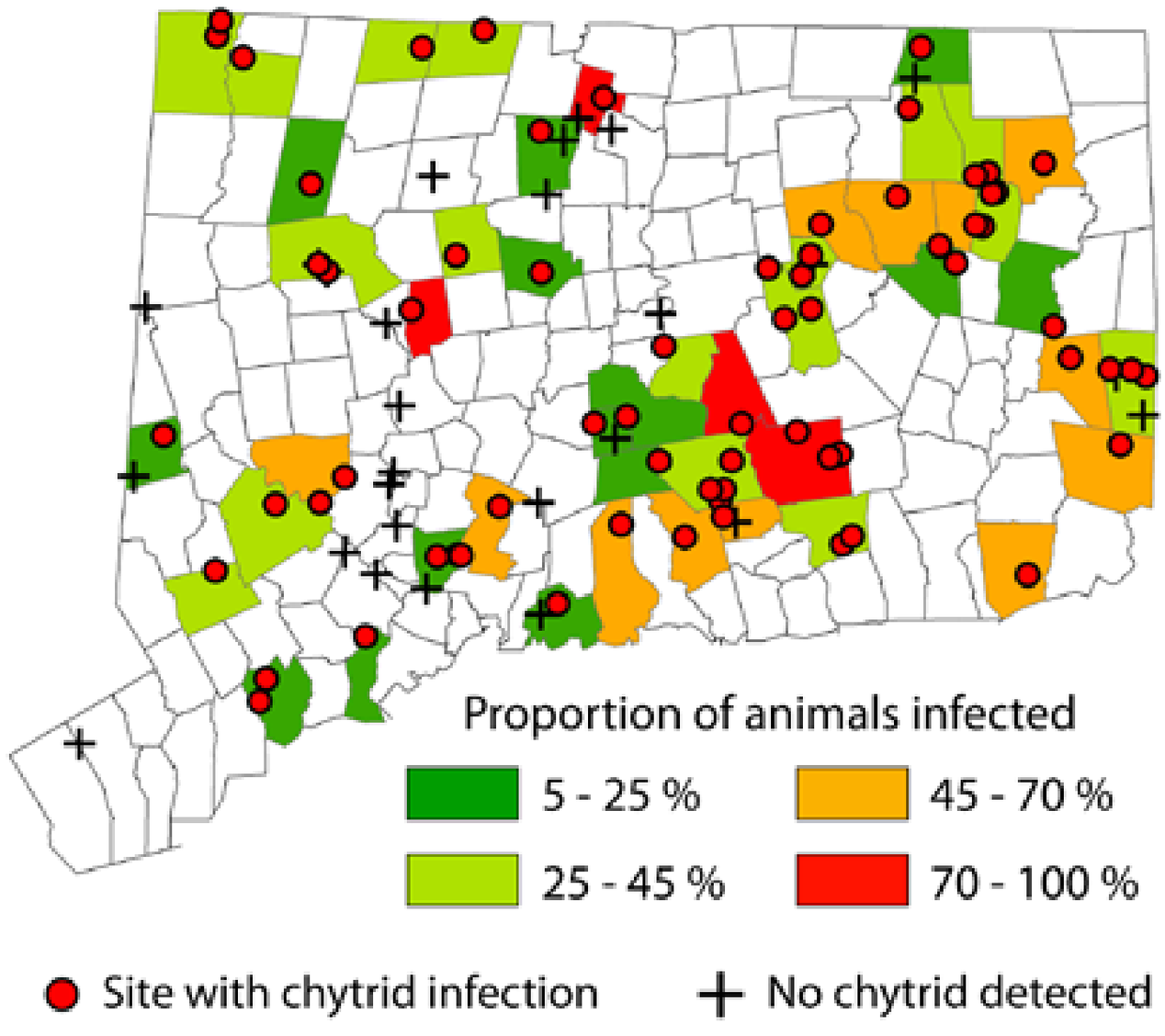
Special Topic: Amphibian Chytrid Fungi

- Chytridiomycosis
  - The infection of Bd in amphibian skin, causing electrolyte imbalances associated with cutaneous water absorption
  - Growth rate highest in cool, damp temperatures, wrecking havoc on endemic cloud forest frogs in the tropics



Special Topic: Amphibian Chytrid Fungi

- Connecticut - a strange Bd case
  - High infection rate across CT (65% of amphibians sampled)
  - …but pathogen loads were order of magnitude lower than in tropic outbreak areas
  - Ranid frogs appear to be unaffected carriers (esp. *R. catesbeiana*)



Special Topic: Amphibian Chytrid Fungi

- New legislation attempting to prevent the spread of Bsal
    - January: US Fish and Wildlife, in an effort to prevent Bsal from entering American, banned import and interstate trade of many native salamanders
- CT salamanders included:
    - *N. viridescent* (lethal)
    - *P. cinereus* (potential carrier)
    - *P. glutinosus* (potential carrier)