Welcome to SCB!

Wednesday, February 10th, 2016

Today's Meeting Outline

- **Creature Feature**
- **Issue of the Week**
- **Committee Updates**
- **Membership Fee Collection**
- **T-Shirt Sales**
- **Committee Meetings**
- **External Initiatives**

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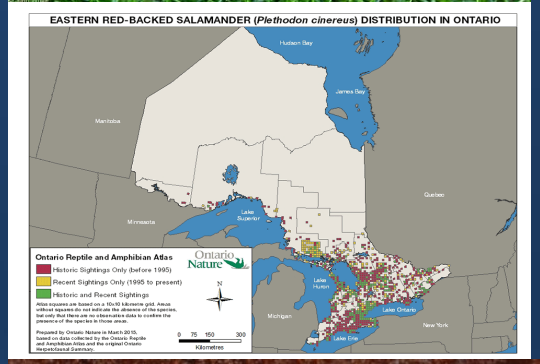
Creature Feature!

- **The Eastern Red-backed Salamander (Plethodon cinereus)**
- **Is one of 55 species in the genus Plethodon, the Lungless Salamanders**
- **Breathes entirely through its permeable skin**
- **Thus is highly sensitive to changes in moisture level, acidity**

Creature Feature!

- Small (5-10 cm) terrestrial salamander found in wooded areas in most of NE N. America
- There are 2 morphs, the red-backed morph and the lead-backed morph
- Unlike most other salamanders, they have no aquatic life stage
- Eggs are laid inside moist logs and guarded by the mother until they hatch!



Biomass of these salamanders compared to all other forms of life boggles the mind!

Salamander Populations and Biomass in the Hubbard Brook Experimental Forest, New Hampshire

THOMAS M. BURTON AND GENE E. LIKENS

There were about 2,950 salamanders per ha (1,770 g/ha wet wt.) in the Hubbard Brook Experimental Forest in New Hampshire. The terrestrial species, *Plethodon cinereus*, accounted for about 93.5% of the total biomass while the streamside species, *Desmognathus fuscus*, *Eurycea bislineata* and *Gyrinophilus porphyriticus*, accounted for the remaining 6.5%. *Notophthalmus viridescens* was present, but was rare and insignificant in the biomass calculations. The population size of salamanders at Hubbard Brook appears to be stable. The biomass of salamanders is about twice that of birds during the bird's peak (breeding) season and is about equal to the biomass of small mammals.

THE Hubbard Brook Ecosystem Study is an interdisciplinary attempt to study in detail an ecological system within the northern hardwood forest. The general ecology, hydrologic and nutrient relationships, productivity and vegetation of these mountainous, forested ecosystems have been described in detail (Bormann

mates for *D. fuscus* varied between 0.43 and 1.42 per m^2 based on relative collecting success. Published values for *P. cinereus* are summarized in Table 1. We know of no published values for *E. bislineata*, *G. porphyriticus*, or the land stage of *N. viridescens*. In favorable areas, pond-dwelling species can attain high densities. Ben-

Batrachochytrium salamandrivorans is public enemy #1 for susceptible salamanders across the world right now.

WILDLIFE DISEASE

Recent introduction of a chytrid fungus endangers Western Palearctic salamanders

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Emerging infectious diseases are reducing biodiversity on a global scale. Recently, the emergence of the chytrid fungus *Batrachochytrium salamandrivorans* resulted in rapid declines in populations of European fire salamanders. Here, we screened more than 5000 amphibians from across four continents and combined experimental assessment of pathogenicity with phylogenetic methods to estimate the threat that this infection poses to amphibian diversity. Results show that *B. salamandrivorans* is restricted to, but highly pathogenic for, salamanders and newts (Urodela). The pathogen likely originated and remained in coexistence with a clade of salamander hosts for millions of years in Asia. As a result of globalization and lack of biosecurity, it has recently been introduced into naïve European amphibian populations, where it is currently causing biodiversity loss.

Emerging infectious diseases play an important role in the ongoing sixth mass extinction

41 out of 44 of the Western Palearctic salamanders (Salamandridae and Plethodontidae) rapidly died

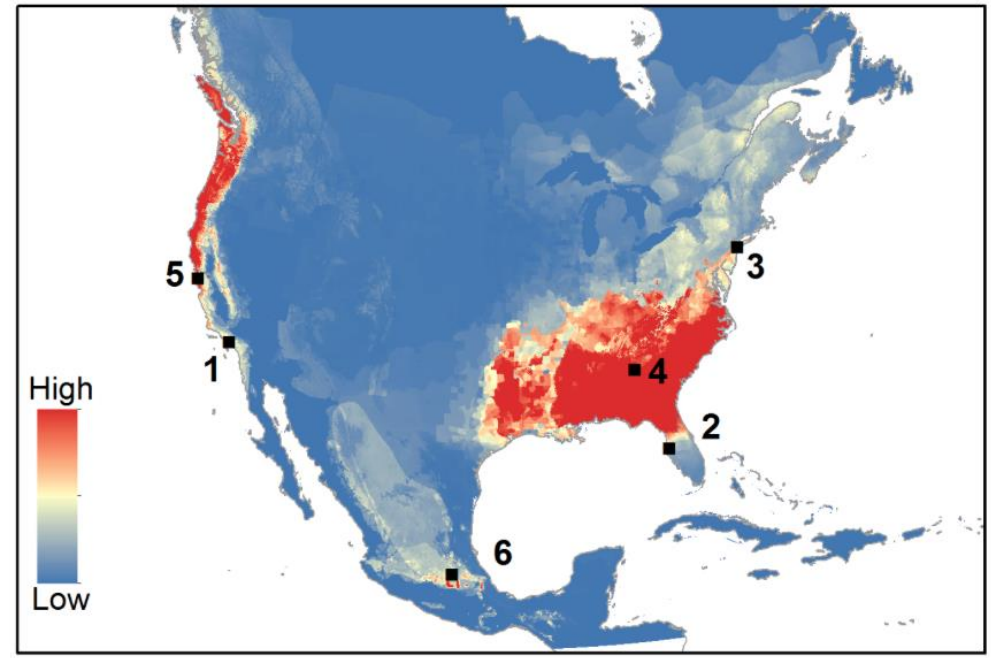
and wild (2 of 5 taxa) urodelans. Our infection experiments indicated three Asian salamanders (*Cynops pyrrhogaster*, *Cynops cyanurus*, and *Paramesotriton deloustali*) as potential reservoirs. Seven specimens of these species were capable of limiting clinical disease and either persisted with infection for up to at least 5 months with recurring episodes of clinical disease, or even totally cleared the infection (table S1 and fig. S2). The combined evidence of natural occurrence and experimental maintenance of *B. salamandrivorans* infections indicates that at least these three species may function as a reservoir in Asia.

To investigate whether these amphibian communities may have constituted a reservoir of infection in the past, we estimated when *B. salamandrivorans* diverged from *B. dendrobatidis* and used present-day patterns of susceptibility to reconstruct amphibian susceptibility through time. Our Bayesian estimates of divergence time with a broad prior calibration range resulted in a mean estimate of 67.3 million years ago (Ma) (fig. S3) and a 95% highest posterior density interval of 115.3 to 30.3 Ma, indicating that *B. salamandrivorans* diverged from *B. dendrobatidis* in the Late Cretaceous or early Paleogene (Fig. 1, gray bar). Maximum parsimony and maximum likelihood ancestral reconstructions (Fig. 1) of amphibian susceptibility suggest that the potential of being a reservoir evolved in the

February 9, 2016

Creature Feature!

Canada is home to many susceptible species, but has a non-ideal environment for the spread of chytrid fungus with our current climate.



Bsal Vulnerability Model for North America (Yap et al. 2015)

Numbers denote "high vulnerability zones based on potential Bsal habitat suitability, species richness, species endemism, and potential ports of entry."

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Creature Feature!

- **What can you do?**
  - **DO NOT EVER** release captive salamanders into the wild!
  - Report salamander sightings to the Ontario Nature Reptile and Amphibian Atlas.
  - Voice your support for conservation projects that protect amphibian habitat like moist woodlands, wetlands and **fishless lakes.**
  - Ontario Nature has a great Reptile and Amphibian Atlas App – check it out!

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THE QUEEN'S UNIVERSITY – SINCE 1873
JOURNAL

Queen's: rethink divestment decision

Queen's stance on fossil fuel divestment misses the point

FEBRUARY 9, 2016 | COURTENAY JACKLIN

Courtenay Jacklin asks Queen's to act on its pledge to "walk the talk" on fossil fuels.

Photo: Stephanie Nijhuis

Issue of the Week

Committee Updates

- **Do we have any updates from…**
  - **Advertising/Social?**
    - **Flyers and Slide looked AMAZING!**
    - **Other updates?**
  - **Education**
    - **Schoolyard Naturalization update**
    - **Other updates?**
  - **Photo Contest**
    - **Canvasing? Bateman print?**
    - **Other updates?**
  - **Sustainability/Issues**
    - **Bake sale update**
    - **“This Changes Everything” update**
    - **Other updates?**

Membership Fee Collection

- **We will be passing around a cash box and member list**
- **If you wish to be an official member of SCB, place $5 in the box and sign your name**
- **If you aren't able to give $5, just sign your name**

T-Shirts!

- **We will be selling SCB t-shirts for $12**
- **They come in S, M, L, and XL**

External Initiatives

- EEB Seminar: “A Student Perspective on PhD Training in Biology at Queen’s” on February 11th (Tomorrow!)
  - https://eebseminar.wordpress.com/
- CRCA’s Valentine’s Day Evening Skate on February 14th
  - http://www.queensevents.ca/event/crca-valentines-evening-skate-weather-permitting/

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