Welcome to:
CONSERVATION BIOLOGY

Details
Fall Semester, 2007, ENWC 467/667
Meeting: Lectures MWF 8-8:50
Instructor: Greg Shriver
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What is Conservation Biology?

“Conservation biology is a synthetic discipline that focuses on the application of biological principles to the preservation of biodiversity; it represents a fusion of relevant ideas from ecology, genetics, biogeography, behavior, reproductive biology, and a number of applied disciplines such as wildlife management and forestry.” Brussard 1988

Three strains:

1. Conserving endangered species
   - Demographic and genetic consequences of small population size
   - Population viability analysis and the biology of small populations
   - Manipulative techniques that enhance survival probability
   - Design of nature reserves for particular species

2. Conserving functional and structural aspects of important ecosystems
   - Diversity and stability of ecological communities
   - Habitat fragmentation
   - Landscape ecology
   - Island biogeography
   - Restoration ecology

The second strain:
The third strain:

3. Working within political and social realities
   - Seek flexible, practical, broad-minded problem solvers

A “fuzzy” science
- A multidisciplinary science -- hence suffering the trials and tribulations of trying to marry varying perspectives;
- A crisis discipline -- reactive rather than proactive, and typically working in triage mode;
- An inexact science -- often data-limited and plagued by uncertainty;
- A value-laden science -- conservation is not necessarily objective;
- A science with an evolutionary time-scale -- “extinction is forever” and so is conservation;
- A science of eternal vigilance -- problems that are solved once don't necessarily stay solved.

New wine? Or just old wine in a new bottle?
- Wildlife biology/management
  - Since the 1930's
  - Focus on maintaining populations of large-bodied birds and mammals for consumptive use
  - Huge, well-defined constituency possibly in decline
- Conservation biology
  - Since the 1980's
  - Focus on intrinsic valuation of all forms of life
  - Modest, diffuse and growing constituency

Course overview
- This course addresses a full range of issues related to the conservation of biodiversity:
  - Genetic diversity,
  - Population biology,
  - Ecosystem management,
  - Conservation policy process and more.
- Lectures and in-class discussions
- Intended as a broad introductory experience to the field of conservation biology

Text
**Grading**

- 4, 1-hour exams (last one cumulative)
- Readings will be ½ of content
- Lecture material will be other ½
- 9, discussion sections (Fridays)
- 3, problem based home work assignments

- Lecture notes and readings will be on web
  - [http://copland.udel.edu/~gshriver/teaching/consvbiology.html](http://copland.udel.edu/~gshriver/teaching/consvbiology.html)

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**Conservation Biology**

Course topic sequence…

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**Part 1. Biodiversity and its Importance**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is conservation biology?</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>What is biodiversity?</td>
<td>Chapters 1-2</td>
</tr>
<tr>
<td>How many species are there?</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>Macroevolution: the source of species diversity</td>
<td>Chapters 4 &amp; 5</td>
</tr>
<tr>
<td>What is biodiversity worth? Social factors</td>
<td>Chapter 15</td>
</tr>
<tr>
<td>What is biodiversity worth? Economics</td>
<td>Chapter 16</td>
</tr>
</tbody>
</table>

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**What is “biodiversity”?**

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**Part 2. Threats to Biodiversity**

<table>
<thead>
<tr>
<th>Threat</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extinctions</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>Population and consumption</td>
<td>Chapters 8-9</td>
</tr>
<tr>
<td>Habitat loss and fragmentation</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>Pollution / Exotic species</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>Exotic species control</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>Climate change</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>Overharvest</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>Small population phenomena</td>
<td>Chapter 7</td>
</tr>
</tbody>
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**Who cares?**

- Biodiversity contributes about 2.9 trillion $ in goods and services to global human welfare each year
- There are also intrinsic, moral, and other reasons to care.
Have there not been extinctions before?
- Sure -- mass extinctions have unfolded about every 26 million years, during which 15-90% of animals have disappeared.
- But extinction rates are now totally askew.
- The background rate of extinction is 1-10 species of all forms have gone extinct each year over geological time.
- During the past decade, this rate has been 100-1,000 species per year, or 100-1,000 times the normal background rate.

This all means that we…
- “...have become the central organizing reality around which non-human life will evolve.”
- Cincotta and Engelman.

Part 3. Maintaining Biodiversity

| Population viability analysis | Chapter 7 |
| Zoons & Gardens | Chapter 14 |
| Species reintroductions | Chapter 13 |
| Managing Ecosystems | Chapter 12 |
| Establishing and designing protected areas | Chapter 11 |

Part 4. The Human Factors

| Conservation organizations | Chapters 15, 16, & 17 |
| International and US-specific laws | Chapters 15, 16, & 17 |
| Envisioning the future: depicting alternative scenarios | Chapters 15, 16, & 17 |
Questions?