Housekeeping, 19 September 2006

Upcoming Readings

today: Text Ch.2, ESA, NEPA, SDCP on website

Thurs 21 Sept: See website (David Hall, guest)
Tues 26 Sept: Text Ch. 5
Thurs 28 Sept: Exam 1

Short oral presentations
19 Sept Grant Rogers and Jeremy Daniel
21 Sept Tara Luckau and Allison Buchanan
26 Sept Jacklyn Hendrickson & Larissa Gronenberg
28 Sept Exam 1

3) Is the endangered species act (ESA) the correct approach for US conservation efforts? Why or why not?

-OR-

Why is biodiversity important? How would you defend any one species to a non-conservationist? (due 19 Sept)

Suggestions: Define terms, include examples, avoid pronouns, etc.

1872 Yellowstone NP
1891 Forest Reserve Act
1916 NPS

1964 Wilderness Act
1965 Land and Water Conservation Fund Act
- acquire lands, use resource revenues
1969/1970 NEPA (EIS)
- think about environment up front
1970 Clean Air Act
1972 Clean Water Act
1973 ESA (species focus)
-endangered, threatened, critical habitat, recovery plan

Successful Laws:
- Inspirational and radical?
- Growth in influence?
- Science and Monitoring?

Does law create social values?
Litigation
e.g., polluters liable, citizen involvement, NGOs,
  public comment, transparency
EDF 1968
  people have right to clean environment
1978 TVA vs. Hill (Snail darter)
  God Squad (economic impact vs. habitat)
  Endangered Species Committee

Conservation Easements
  remove development rights -->
  value decreases so less in taxes
  reversible?

National Environmental Policy Act of 1969
(NEPA)

Requires that all Federal Agencies prepare
detailed environmental impact statements for
“every recommendation or report on
proposals for legislation and other major
Federal actions that significantly affect the
quality of the human environment.”

Federal Hook or Nexus? (land, funds, permits)

The Story of NEPA
(through the eyes of Dave Prival,
  Brooke Gebow, and Cori Dolan,
  March 2004)

“…man and nature can exist in productive harmony…”
- National Environmental Policy Act (1969)
Under NEPA, if a government agency is planning to do something that will significantly affect the quality of the environment, that agency has to write an…

Environmental Impact Statement

National Environmental Policy Act of 1969 (NEPA)

• Environmental Assessment (EA)
• FONSI
• Environmental Impact Statement (EIS)

An EIS includes…

• Project goals and objectives
• Resources that might be affected
• Alternative ways to try to achieve the goals
• Environmental impacts that are likely to occur under each alternative
• Potential mitigation

The public gets to review the EIS and make comments. The agency has to take these comments into account before deciding upon an alternative.
Summary

- The EIS is supposed to help agencies decide how they can achieve their goals, taking all environmental impacts into account, with input from the people who are going to be affected (the public).

EIS drawbacks?

- The EIS is supposed to help agencies decide how they can achieve their goals, taking all environmental impacts into account, with input from the people who are going to be affected (the public).

Pre-Endangered Species Act of 1973 Legislation

- Lacey Act - 1900. Authorized Federal enforcement of state wildlife laws and based on Federal power to regulate interstate commerce.

- Committee on Rare and Endangered Wildlife Species 1964 - consists of 9 biologist - published the first “Redbook” - first Federal list of fish and wildlife considered threatened with extinction.

Pre-Endangered Species Act of 1973 Legislation

- Lacey Act - 1900.

- Committee on Rare and Endangered Wildlife Species 1964

- 1966 Endangered Species Preservation Act - Federal agencies must conserve habitats of native vertebrate species found by the Secretary of the Interior to be in danger of Extinction to the extent “Practicable and consistent” with the primary purposes of the Federal agencies.

ESA

The endangered species program

http://www.fws.gov/endangered/

“Taking”
Shoot, Shovel, Shut Up

Led to Habitat Conservation Planning (HCP)
Incidental Take Permits (e.g., SDCP with mitigation)

San Bruno Mtns
- negotiate, compromise, all parties involved

“No Surprises”
MOAs
Safe Harbor Agreements

Need to include and motivate private landowners
Pre-Endangered Species Act of 1973 Legislation

- 1969 Endangered Species Conservation Act - extended protection to invertebrates, and extended the Lacey Act’s prohibitions to cover interstate commerce in illegally taken reptiles, amphibians, and certain invertebrates. Also took Global View - authorized Secretary to make a list of species threatened with worldwide extinction and with limited exceptions permitted the Secretary to prohibit imports of such species or their products into the U.S.

Endangered Species Act of 1973, as Amended

- Largest controversy involved whether protection should be extended to plants.
- Not seen as a large economic issue. Passed Senate unanimously, passed House overwhelmingly
- Signed into law on December 28, 1973

Endangered Species Act of 1973, as Amended

- Jointly administered by Secretaries of Interior and Commerce (Fish and Wildlife Service and National Marine Fisheries Service)
- Amended many times.

Endangered Species Act of 1973, as Amended

- Section 3. Definitions
- Section 4. Determination of endangered species and threatened species (Listing)
- Section 5. Land acquisition
- Section 6. Cooperation with States
- Section 7. Interagency cooperation
- Section 8. International cooperation
- Section 8A. Convention implementation
- Section 9. Prohibited Acts
- Section 10. Exceptions
- Section 11. Penalties and enforcement
- Section 12. Endangered Plants

Section 4, ESA

Listing Species Pursuant to the Endangered Species Act of 1973, As Amended

Thanks to Paul Barrett and Sherry Barrett
5 Listing Factors

1. The present or threatened destruction, modification, or curtailment of its habitat or range;
2. Overutilization for commercial, recreational, scientific, or educational purposes;
3. Disease or predation;
4. The inadequacy of existing regulatory mechanisms;
5. Other natural or manmade factors affecting its continued existence.

Section 7, ESA
Interagency cooperation

Section 10, ESA

Exceptions
10(a)(1)(A) – Recovery Permits
10(a)(1)(B) - HCP

Recovery Planning

Mount Graham Red Squirrel
*Tamiasciurus hudsonicus grahamensis*

- Listed as endangered in 1987
Mount Graham Red Squirrel
* Tamiasciurus hudsonicus grahamensis

- Restricted to:
  - Spruce-Fir
  - Transition
  - Mixed Conifer
  - Above 8000 ft

Revised Mount Graham Red Squirrel
(Tamiasciurus hudsonicus grahamensis) Recovery Plan

- Technical Subteam
  - Squirrel biologists
  - Silviculturalist
  - Fire Ecologist
  - Forest health specialist
  - Conservation biologists
  - Population biologists
  - Entomologists

Revised Mount Graham Red Squirrel
(Tamiasciurus hudsonicus grahamensis) Recovery Plan

- Implementation Subteam
  - Forest Service
  - AGFD
  - Local Governments
  - Steward Observatory
  - Local Interests (Summerhome Associations)
  - Nongovernmental Organizations
  - Native American Tribes

ESA

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Shoot, Shovel, Shut Up

Led to Habitat Conservation Planning (HCP)
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San Bruno Mtns
- negotiate, compromise, all parties involved

"No Surprises"
MOAs
Safe Harbor Agreements

Need to include and motivate private landowners
The U.S. Fish and Wildlife Service has completed a final rule designating 32 units of critical habitat along the coast of California, Oregon, and Washington for the Pacific coast population of the western snowy plover, a Federally threatened species. The critical habitat units total 12,145 acres, nearly 40 percent less acreage than an earlier critical habitat plan the Service adopted in 1999.

Of the designated units, 24 are in California (7,472 acres), five are in Oregon (2,147 acres), and three are in Washington (2,526 acres). Of the total acreage, 2,479 acres (20 percent) are on Federal lands; 6,474 acres (53 percent) are owned by states or local agencies; and 3,191 acres (26 percent) are private.

Compared to the 1999 plan, today’s action designates more critical habitat units but generally smaller ones, based on increased knowledge of the species’ needs and better mapping. This new rule designates 32 units covering 12,145 acres, compared to 28 units covering 19,474 acres in the 1999 plan.

The rule will take effect 30 days after publication. Some 2,859 acres of proposed critical habitat in six units were deleted based on the projected cost of designating critical habitat. An economic analysis prepared by Industrial Economics Inc. projected that critical habitat could cost between $273 million and $645 million, with the biggest costs due to beach recreation losses. More than three-quarters of the loss was found to occur in five proposed California critical habitat units, located on Coronado’s Silver Strand, Morro Bay, Pismo Beach, and two on Monterey Bay.

In addition, 615 acres were deleted because of management plans and commitments — such as Habitat Conservation Plans — and 1,621 acres were deleted because they are covered by military land management plans or national security needs.


International Conservation Laws and Treaties

Implementation, Compliance, Effectiveness
Fewer people and larger industry = easier

Intent and Capacity to comply
-incentives vs. coercion

CITES:

1937 Whaling
1950 Birds
1958 Benelux (birds)
1973 Baltic Sea
1973 CITES (trade or species?)
Appendix I, II, III
1982 Antarctic Marine Resources

Habitats and Ecosystems...

1971 Ramsar Wetlands (Iran)
119 countries
500 listed wetlands

1972 UN (UNEP)
United Nations Environmental Program
-include social issues
1992 Earth Summit (aka Rio Summit)
- Agenda 21
  (environment, social issues, poverty, technology transfer, sustainability, water, pollution)
- 178 Governments
- Developed countries aid developing
- Sustainable Development
- Polluter Pays
- Convention on Global Warming
- Convention on Biodiversity

1972 US Marine Mammal Protection Act
dolphins
tuna
international trade

1989 US Sea Turtle Act
shrimp
TED's
international trade
GATT (general agreement on tariffs and free trade)
-WTO - trade over environment
-Leadership vs. Imperialism

Conservation Imperialism?

http://www.pima.gov/cmo/sdcp/
Biological Basis of the Sonoran Desert Conservation Plan

Thanks to Bob Steidl and others...

SDCP Biological Goal

Ensure the long-term survival of the full spectrum of plants and animals that are indigenous to Pima County...

Approach

• Select elements for planning
• Establish quantifiable goals
• Develop explicit rules for reserve design process
• Organize, synthesize, and acquire information
• Evaluate
• Establish, Monitor, Manage

Planning Alternatives

• Biotic elements
  – Vertebrates
  – Vegetation communities
• Abiotic elements
  – Land cover, land form, elevation, aspect, etc.
• Unique elements

Select Species

• Regionally “vulnerable” species
• Short-list of 55 species

Species chosen should have little influence on ultimate reserve design
Species List

- 9 mammals
- 8 birds
- 7 reptiles
- 2 frogs
- 6 fish
- 16 invertebrates
- 7 plants

>60% of plants and vertebrates associated with riparian environments

Species Information

- Natural history accounts
- Species-environment matrix
- Decide best method by which to achieve goals for each species
- Less helpful if:
  - either rare or common
  - on lands that are protected or off-limits
  - limited natural-history information
- Reduced from 55 to 44 species

Land Cover

- Vegetation communities
- Abiotic / physical
- Urban, suburban, rural land-uses
- Ownership and level of protection
- Threats

Species-Environment Matrix

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<thead>
<tr>
<th>Variable</th>
<th>No. Attributes</th>
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<td>Vegetation</td>
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<td>Urban</td>
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<tr>
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<td>Streams</td>
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<tr>
<td>Landform</td>
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<td>Carbonates</td>
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<td>Geology</td>
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Species Distributions

- Based on models rather than known locations or published distributions
- Developed to predict species distributions based on potential habitat
- Input and evaluation by experts
  - Habitat associations, known distribution
- Iterate
- Combine to identify areas of high species richness
Matrix Rank Scores

Western Yellow Bat (Lasius ega)

<table>
<thead>
<tr>
<th>Elevation (m)</th>
<th>Score</th>
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<tbody>
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<td>195 - 600</td>
<td>2</td>
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<tr>
<td>600 - 800</td>
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<td>800 - 1200</td>
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<td>1200 - 1400</td>
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<td>** mask **</td>
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<td>2000 - 2800</td>
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Elevation Scores

Hydrology Scores

Vegetation Scores

Generate Distribution

Habitat Model
Iterative Process

Baseline Species Data
Fill Species-Environmental Matrix
Refine Model Parameters
Expert Input and Adjustments
Species Potential Distribution

Initial Model

Intermediate Model

Final Model + known locations

Initial Model

Intermediate Model
Design Principles

- Comprehensive conservation
- Species richness as foundation
- Contiguosness and Connectivity
- Intactness
- Opportunity and Realism

Other Considerations

- Special elements
- Areas needed to meet species goals
- Landscape linkages
- Recovery areas for endangered species
- Areas identified by The Nature Conservancy as significant for conservation

Special Elements

Pygmy Owl Habitat
Saguaro and Ironwood communities

Reserve Building

Initial Reserve Boundary

Conservation Lands System

- Biological Core
- Multiple Use
- Scientific Research
- Recovery Areas
- Agriculture Within Recovery Areas
- Existing Development
Species Richness, 5 or more

Biological Core

Species Richness – Expert Opinion

Biologically Preferred

Riparian as Foundation for Linkages

Only Listed Species
Monitoring and Adaptive Management

- **Assess** status and trends of representative organisms
- Information to assess land-management practices
- Careful and efficient design
- **Long-term** financial commitment