N = 27 @ 12:30



Conservation Biology, EXAM I (100 points) NAME: KEY [1 point]
28 September 2006

Your exam will take place in two parts. The first will be a typical individual exam which should take you about 50 minutes. The second part will be about 25 minutes in groups of four students on a short set of additional questions. The score for your group exam will earn you additional points on your individual exam. See your syllabus for grading details.

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1. When did the Endangered Species Act become law? [2 points]
   A. 1970
   B. 1973
   C. 1872
   D. 1986
   E. none of the above

2. Who wrote *Silent Spring*? [2 points]
   a. Rachel Carson
   b. Aldo Leopold
   c. Ralph Waldo Emerson
   d. John Muir
   e. none of the above

3. The estimated value of ecosystem services, according to Costanza 1997, is: [2 points]
   a. 1/3 global GNP
   b. ½ global GNP
   c. ¼ global GNP
   d. 1x global GNP
   e. 2x global GNP

4. What is currently the greatest threat to biodiversity? [2 points]
   a) hunting and trapping
   b) exotic species
   c) spread of disease and pathogens
   d) habitat modification
   e) asteroids

5. Approximately what proportion of valley-bottom wetlands are intact in Arizona? [2 points]

   ~ 5%

6. Distinguish among: [6 points]

   Umbrella species -- protection of umbrella species should also protect other spp/ecosystems

   Indicator species -- species whose status should reflect habitat integrity/quality

   Keystone species – species whose role in ecosystem dynamics is greater than would be predicted based on the number of individuals of that species in the ecosystem

16

KEY



7. Imagine you were able to have Henry David Thoreau and Teddy Roosevelt over for dinner. If you asked them about their environmental ethic, what would each of them say? Hint: use information presented in class and your readings. [6 points]

Romantic-transcendentalist
intrinsic and aesthetic/spiritual value of nature

Resource Conservation
Gifford Pinchot
"greatest good for greatest # for longest time"

8. What are the two most consistent abiotic predictors of vegetative communities across the globe? [3 points]

temperature + precipitation

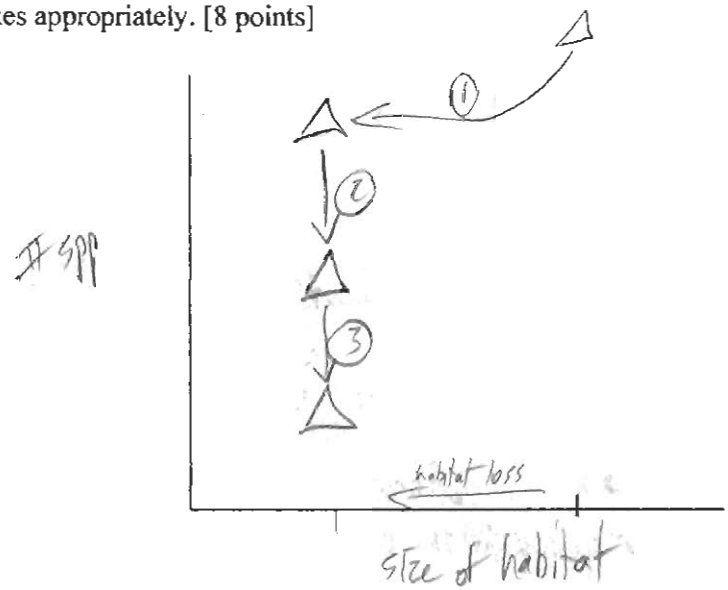
9. What does the acronym HCP stand for and under what section of the ESA does it fall? [4 points]

habitat conservation plan 10

10. Define biodiversity and justify your definition. [6 points]

fairly open, but should encompass biology @ multiple scales from genetic variation to biome variation

11. Diagram and explain Rosenzweig's 3-step loss of biodiversity using the axes below. Be sure to label your axes appropriately. [8 points]




① loss of endemics

② loss of species represented by small populations

③ loss of spp b/c stochastic environmental/genetic processes

/27

KEY



12. Explain how beta diversity and gamma diversity measure different things. [5 points]

↳ change in species/community composition as an environmental variable (soil pH, salinity, precipitation, elevation) changes

gamma measures species/community replacement across geographical distance with an attempt @ comparing habitats that do not differ in other variables besides geographic location

13. What conservation lesson should we take from David Hall's lecture? Why? [5 points]

fairly open but likely answer involves fallacy of single species approach as opposed to community conservation approach.

He talked about native riparian amphibians and macroinvertebrates; introduced fish, and stream gradients

14. A common measure of alpha diversity is the Shannon Index. This index incorporates two main concepts. Explain what the two concepts are and how changing one of them can alter the Shannon Index value. [6 points]

1 species richness (# of spp)

2 species evenness (what proportion of all individuals comprises species x or y or z)

↑ either is ↑ Shannon Index

15. Explain the merits and pitfalls of using instrumental values as a justification for preserving biodiversity. [6 points]

rather open, but be intelligent + justify your answer

examples always helpful

pros – easily incorporated into traditional economic framework

cons – ignores moral basis for conservation or intrinsic value

16. How are externalities and conservation biology related? [5 points]

↳ costs or benefits not typically included in economic decision-making process of companies/governments/individuals

- examples include pollution, negative human health consequences, causes of erosion or flooding etc.
- important for conservation b/c many environmentally harmful activities would cease if their true costs were borne by perpetrators

17

17. Under what conditions is an EIS typically warranted (please also define the acronym)? [6 points]

1 – federal land, funds, or permits (=federal hook or nexus)

2 - EA did not result in FONSI

(3 - agencies have to think up front about environmental impact of actions)

Environmental Impact Statement

NEPA & ESA

18. Choose one of the readings by Leopold assigned in this class and summarize the important point as it relates to conversation biology. [6 points]

open; again, be intelligent + relevant + give examples where possible

everyone (except 1 person) chose "Thinking Like a Mountain"

19. List three very important contributors to an individual's ecological footprint. Justify your answer. [6 points]

reproduction
transportation
food
housing
~~recycling~~

+ justify

20. Explain the difference between specialist and generalist species using the concepts of habitat and niche. [6 points]

habitat ~ place
niche ~ "job/role"

define terms

→ broad habitat requirements + niche; tolerate variety of foods + environmental conditions

→ specialized diet or role or habitat requirements

21. Choose one of the short class presentations by your peers. Summarize the main lesson for conservation biology using their examples. Be as specific as you can. [5 points]

open; but be intelligent + pertinent