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Zoology 468 Wildlife Biology Principles
First Hour Exam 100 points total September 24, 2007
Read the questions and answers carefully and thoroughly.

All questions can be answered in 2 sentences or less.

- 1) (4 pts) What component of adaptive management is missing from the following wildlife management plan?

"Our goal is to increase the abundance of the spectacled gnatcatcher, a cavity-nesting bird. Spectacled gnatcatcher abundance could be increased by releasing captive-bred birds, translocating individuals from other populations, reducing predators, or increasing nest sites (hollow trees). Nest sites appear to be limiting, so we will girdle trees to create new nesting sites. We will monitor gnatcatcher abundance by counting the number of singing males each year. If adding nest sites does not work, we will attempt to reduce predators."

NEED TO ESTABLISH CLEAR CRITERIA FOR SUCCESS

- 2) (3 pts) Which of the following did **NOT** contribute to the extinction of the passenger pigeon? (choose one)
- a) Invention of the telegraph
 - b) DDT pollution**
 - c) Low reproductive rate
 - d) Unregulated market hunting
 - e) Development of railroad networks
- 3) (3 pts) The idea that wild animals are common property of all citizens of each state (rather than the owner of the particular property they occupy) is called the: (choose one)
- a) Dingell-Johnson Act
 - b) Public Trust Doctrine**
 - c) Wise Use Doctrine
 - d) National Environmental Policy
- 4) (4 pts) Which strategy below best describes the main form of wildlife management in the U.S in the early 1900's, in response to wildlife depletion in the 1800's? (choose one)
- a) improve habitat quality and maintain ecological interactions
 - b) let nature take its course
 - c) greatly restrict hunting, eliminate predators, and repopulate through captive breeding**
 - d) allow unrestricted market hunting

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5) (8 pts) Match each legislation (letters) with the appropriate description (Roman numerals)

- III a) Lacey Act 1900
- I b) Migratory Bird Hunting Stamp Act 1934
- IV c) Federal Aid in Wildlife Restoration Act 1937
- II d) National Forest Management Act 1976

- I) Required purchase of a stamp to hunt waterfowl; money for National Wildlife Refuges
- II) Required management for sustainable yield and multiple uses
- III) Federal law against transporting illegally taken wildlife across state lines
- IV) Established excise tax on hunting equipment, money spent on wildlife research and habitat

6) (3 pts) In "A Sand County Almanac," who wrote "To keep every cog and wheel is the first precaution of intelligent tinkering"?

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7) (3 pts) Each spring, people in Amherst, Massachusetts, gather on a back road to observe spotted salamanders crossing the road their way to breeding ponds. Some people travel from other states (**requiring food and gasoline**) to view the salamanders, and many of the people have so much **fun** watching the **handsome** salamanders that they return year after year, forming a sort of "**salamander club.**"

Which of the following values is/are **NOT** evident from the paragraph above? (Circle all that apply)

- a) commercial
- b) biological**
- c) aesthetic
- d) social
- e) recreation
- f) existence (OK IF NOT CHECKED)**

8) (3 pts) A recent survey from Massachusetts found that some people were willing to pay an average of \$5.00 to preserve coyotes. What is this method of measuring the value of wildlife called? (choose one)

- g) commercial
- h) travel cost method
- i) gross expenditure method
- j) contingent valuation method**
- k) kernel method

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- 9) (3 pts) Suppose two species of sandpipers forage along a shoreline, one has a long beak (can reach invertebrates deep in the sand) and the other has a short beak (eats invertebrates on the surface). On this particular beach, most invertebrates are deep, so the long-beaked species gets more food. This is best described as an example of: (choose one)
- a) **scramble competition**
 - b) interference competition
 - c) dominance hierarchy
 - d) **resource partitioning**
- 10) (4 pts) Suppose that a group of hedgehogs happens to colonize an island where temperatures are consistently hotter than the place they left. What changes over time would you expect to see in this new population as it adapts to the hot island environment (choose all that apply)?
- a) smaller nose (relative to the body)
 - b) **more nocturnal behavior**
 - c) **smaller body size**
 - d) thicker fur
 - e) no consistent difference
- 11) (3 pts) What form of natural selection is described in question 9 (choose one)?
- a) Stabilizing
 - b) Disruptive
 - c) Cantankerous
 - d) **Directional**
- 12) (3 pt) The range of temperatures where an animal's resting metabolism is lowest is called its: (choose one)
- a) comfort zone
 - b) sleep number
 - c) ecotone
 - d) range of tolerance
 - e) **thermal neutral zone**
- 13) (3 pts) According to Bergmann's Rule, animals living in polar areas tend to be which (compared to related animals near the equator)?
- a) Darker
 - b) Smaller
 - c) Tougher
 - d) **Larger**

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14) (3 pts) What biological process produces metabolic water? (choose one)

- a) digestion of proteins
- b) excretion
- c) countercurrent exchange
- d) oxidation of glucose**

15) (3 pts) Which of the following is an example of **dispersal**? (choose one)

- a) maintaining a territory separate from neighboring territories
- b) establishing a home range away from the animal's birth site**
- c) establishing a home range that includes the animal's birth site
- d) moving between winter and summer home ranges
- e) feeding and resting within a core area

16) (3 pts) Which of the following is a disadvantage of the kernel method of describing a home range (compared with the minimum convex polygon method)? (choose one)

- a) it only works for males
- b) it requires global positioning systems
- c) it provides no information about space use within the home range
- d) it is mathematically complicated**

17) (5 pts) Match each term with the **one** most appropriate description

- | | | |
|---|---------------|---|
| 4 | a) home range | 1) movement between winter and summer home ranges |
| 3 | b) territory | 2) tendency to stay in an individual's natal home range |
| 5 | c) core area | 3) area defended against other individuals |
| 1 | d) migration | 4) an area <u>repeatedly</u> traveled by an individual in its normal activities |
| 2 | e) philopatry | 5) portion of the home range where an individual spends most of its time |

18) (3 pts) Is a food containing lots of energy and protein necessarily a **high quality** food? Why or why not? (1-2 sentences)

NO, COULD BE TOXIC OR DIFFICULT TO DIGEST
ALSO ACCEPTED NEED FOR OTHER NUTRIENTS (E.G., MINERALS) THAT
COULD BE LIMITING

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19) (4 pts) Match each description with the appropriate type of diet (**1 to 1 match**):

- | | |
|--|----------------|
| <u>B</u> food is undefended, but varies in time & space | a) granivory |
| <u>D</u> food requires a complex digestive tract to digest | b) nectarivory |
| <u>C</u> food has low C:N ratio, but is often scarce | c) carnivory |
| <u>A</u> food can often be cached for long periods | d) herbivory |

20) (4 pts) All else being equal, which of the following statements about body size and diet is correct (**choose all that apply**)?

- a) Smaller animals must eat more total food than larger animals
- b) **Smaller animals must eat more food relative to their size**
- c) **With the same amount of food, larger animals can eat a lower quality diet (OK if C is not checked)**
- d) Metabolic rate is not related to body size
- e) None of the above

21) (3 pts) Based on what you know about efficiency of the two species' digestive systems, why would caribou choose to eat goose feces? (**1-2 sentences**)

GEESE SELECT NUTRIENT RICH FOOD BUT HAVE HIGH-THROUGHPUT, LOW-EFFICIENCY DIGESTION. THEIR FECES CONTAIN UNDIGESTED NUTRIENTS THAT THE SLOWER, MORE EFFICIENT RUMINANT DIGESTION OF CARIBOU CAN EXTRACT

22) (5 pts) Which of the following are characteristics of a cecalid digestive system (**circle all that apply**)

- a) fermentation occurs before protein digestion
- b) **coprophagy is common**
- c) microbes (not the cecalid) get first access to simple sugars in food
- d) **fermentation occurs after protein digestion**
- e) **single-chambered stomach**

23) (3 pts) As high-quality food becomes more abundant, would you expect the optimal diet of an animal to become more **stenophagous** or euryphagous ? (choose one)

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24) (3 pts) The marginal value theorem predicts that an optimal forager should leave a patch when its energy intake rate in that patch equals the average intake in other patches. What is one condition that could make this prediction fail?

DOES NOT KNOW AVERAGE OF OTHER PATCHES, CANNOT ASSESS YIELD IN CURRENT PATCH, MOVING BETWEEN PATCHES REQUIRES ENERGY OR TIME, PREDATION RISK DIFFERS AMONG PATCHES, FORAGER DOES NOT HAVE ACCESS TO ALL PATCHES, ENERGY IS NOT THE LIMITING NUTRIENT FOR THIS FORAGER

25) (3 pts) Suppose that you study wildlife in a grassland and find a purple-spotted toadsucker (not a real species). Suppose you investigate other grasslands and continue to find purple-spotted toadsuckers living and nesting there. Which is the best term to describe these findings? (choose one)

- a) purple-spotted toadsuckers *select* grasslands (**PARTIAL CREDIT**)
- b) purple-spotted toadsuckers *prefer* grasslands
- c) **purple-spotted toadsuckers are associated with grasslands**
- d) purple-spotted toadsuckers *require* grasslands

26) (5 pts) Suppose you monitor the movements of a black rat snake, and collect the following data on its habitat use.

Habitat Type	# Times Snake Was Located	% Times (di)	Amount of Habitat (ha)	% Habitat (ai)
Wetland	4	5	25	16.67
Forest/Field Edge	21	26.25	10	6.67
Field Interior	20	25	80	53.33
Forest	35	43.75	35	23.33

a. What is Ivlev's electivity index for Forest?

$$\underline{E_i = (43.75 - 23.33) / (43.75 + 23.33) = 20.42 / 67.08 = 0.304}$$

b. What habitat type is used the most in relation to its availability? **Forest/Field Edge**

c. What habitat type is used least in relation to its availability **Wetland**

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27) (3 pts) Suppose you find that survival and reproductive rates of purple-spotted toadsuckers in several different grassland patches are approximately equal for all patches. Which hypothesis is most consistent with these findings? (choose one)

- a) toadsuckers cannot assess habitat quality
- b) toadsuckers have an ideal despotic distribution
- c) toadsuckers have an ideal free distribution**
- d) toadsuckers are crepuscular

28) (3 pts) A landowner with 300 acres of forest wants to improve wildlife habitat by creating small clearings (planted with grasses and forbs) in the forest. Which of the following statements about this strategy is likely **true** (circle all that apply)?

- a) Amount of ecotone will increase**
- b) Area-sensitive species will benefit
- c) Wildlife diversity will increase**
- d) Clearings will remain open unless he plants trees in them
- e) All wildlife species will benefit