

2009 NEW HAMPSHIRE ENVIROTHON: FISH AND WILDLIFE TEST

SECTION I - Wildlife Identification [1 pt each]

Team #: _____

Calls

- 1: *Green Frog*
- 2: *American Robin*
- 3: *Wild Turkey*
- 4: *Barred Owl*

Fish

- 5: *Smallmouth Bass*
- 6: *Pumpkinseed Sunfish*
- 7: *Yellow Perch*
- 8: *Brook Trout*
- 9: *Chain Pickerel*
- 10: *White Sucker*

Amphibians/Reptiles

- 11: *Wood Frog*
- 12: *Red-Backed Salamander*
- 13: *Common Garter Snake*

Mammals

- 14: *Bobcat (track/scat)*
- 15: *Grey Fox (pelt)*
- 16: *Coyote (pelt)*
- 17: *Fisher (pelt)*
- 18: *Raccoon (track/scat)*
- 19: *Striped Skunk (pelt)*

Birds

- 20: *Upland Sandpiper*
- 21: *American Woodcock*
- 22: *American Bittern*
- 23: *Osprey*
- 24: *Scarlet Tanager*
- 25: *Mute Swan*

SECTION II**TEAM #:** _____

Write the letter of the matching definition in the blank provided. There are more definitions than terms, so read them carefully! (2 points each)

Phenology	<u>F</u>	A. Animals that are most active during the day.
Natural Selection	<u>S</u>	B. Maintenance of constant internal physiological conditions in the face of a varying external environment
Fecundity	<u>E</u>	C. Seasonal depressional wetlands – important for amphibian breeding
Photoperiod	<u>O</u>	D. The localized elimination of a species from a region
Homeostasis	<u>B</u>	E. The rate at which an individual produces offspring
Boreal	<u>G</u>	F. The study of the response of living organisms to seasonal and climatic changes to the environment in which they live
Sexual Dimorphism	<u>Q</u>	G. A forest region in North America where the plants and animals are adapted to cold temperatures and the dominant tree species are conifers.
Nocturnal	<u>K</u>	H. A reversible change in the morphology or physiology of an organism in response to environmental change
Extirpation	<u>D</u>	I. A condition present in an environment in such short supply that it restricts growth, reproduction, or other life processes
Acclimation	<u>H</u>	J. A region on mountaintops where extreme weather conditions make survival impossible for tall trees
Limiting factor	<u>I</u>	K. Animals that are most active during the night
Herbivore	<u>L</u>	L. Organisms whose diet is dominated by plant material
Detritus	<u>P</u>	M. Organisms whose diet is dominated by animal material
Vernal Pool	<u>C</u>	N. The rate at which fetuses develop
Niche	<u>R</u>	O. Length of daylight
		P. Fine organic and inorganic particles made from decomposing plants, animals, & minerals
		Q. The difference of physical form between males and females of the same species
		R. The specific role occupied by an organism within its community
		S. The process that allows for individuals with inherited characteristics most suited to their environment to pass on those characteristics to their descendants
		T. Permanent wetlands found in forests – important areas for fish breeding

Section III – Concepts

Team #: _____

Question 1 (10 pts): There are three species of lagomorphs occurring in New Hampshire - the eastern cottontail, New England cottontail and snowshoe hare. Although the ranges of the three species overlap, only one species, the native New England cottontail, has been experiencing a serious decline in population, to the point that it has just been classified as endangered by the state of New Hampshire.

a. What are two likely reasons for its decline? (2 pts. each)

Decline in early successional habitat; and competition with expanding populations of eastern cottontails

b. Describe two management techniques the manager of Bear Brook State Park could employ that would enhance the habitat for all three species. (2 pts. each)

Controlled burns; clearing of forest patches; mowing or burning of open areas to keep open as old field or early successional forest; maintain class 1 and 2 forest road edges as dense, shrubby corridors.

c. Name a mammalian predator that has a physical adaptation that allows it to be especially good at catching snowshoe hare and name that adaptation. (1 pt each)

- *Canada lynx*
- *Long back legs and extra large feet that allow them to travel well on snow*

Section III – Concepts

Team #: _____

Question 2 (15 pts.): Winter is the most stressful time of year for most forms of NH wildlife. The key hardships are a lack of food and cold temperatures.

a. Name five (5) physical/behavioral adaptations that wildlife uses to deal with winter in New Hampshire. (1 pt each)

1. Migration

2. Hibernation (torpor)

3. Grow a winter coat/change coat color

4. Store food for the winter

5. temporary habitat changes (yarding, subnivalian space, softwood cover, etc.)

b. For each adaptation listed above, name one species that uses that adaptation and tell us if the range of that particular species in NH is expected to increase, decrease, or remain constant within the next 50 years¹. (1 pt each)

¹ Assume the rate of climate change, increasing numbers of people living in NH, and conversion of open space into housing lots continues at their current rate.

	Species	Increase, Decrease, or Constant
Adaptation 1.	<i>Birds</i>	<i>Note 1</i>
Adaptation 2.	<i>chipmunk, bat, woodchuck, opossum, frog, turtle, bear</i>	<i>Note 1</i>
Adaptation 3.	<i>color change (hare, ermine) winter coat (mammals)</i>	<i>Note 1</i>
Adaptation 4.	<i>squirrel, beaver, muskrat</i>	<i>Note 1</i>
Adaptation 5.	<i>deer (yarding), small mammals and weasels (subnivalian space), grouse and turkeys (softwood cover)</i>	<i>Note 1</i>

Note 1: Species specific - northern species, coastal species, most herps, and interior bird species will decrease, those that thrive in the presence of humans will increase, others will remain constant

Section III – Concepts

Team #: _____

Question 3 (10 pts): Name the habitat type where you would expect to find the following pairs of bird species:

- a. Bicknell's Thrush and Spruce Grouse *Boreal (Northern) Forest*
- b. Bobolink and Eastern Meadowlark *Grassland*
- c. Piping plover and Spotted Sandpiper *Coastal*
- d. Common Loon and Hooded Merganser¹ *Lakes and ponds with clear water and FISH*
- e. Common Goldeneye and Wood Duck¹ *wetlands with forest edges and availability of NEST CAVITIES*

¹Hint - make sure that you mention the critical limiting factor within the habitat.

Section III – Concepts

Team #: _____

Question 4 (10 pts): An oxbow of the Merrimack River is surrounded by a road, parking lots and agricultural fields and is beginning to experience amphibian and fish mortality as well as increased submerged aquatic vegetation leading to gradual filling in of the pond.

a. Name three point or non-point discharges that may be negatively impacting the species abundance or biodiversity in the pond. (1 pt each)

pesticides/herbicides, fertilizer/nutrient loading, petroleum products, road salt, road sand/erosion

b. Name three management techniques that could help to alleviate or avoid those impacts. (1 pt each)

- 1. work with the farmer to reduce pesticide/herbicide use/ensure proper application rates; crop rotation; switch to IPM practices, etc.*
- 2. have farmer leave a buffer strip of vegetation at least 50' width from pond; application timing management; ensure proper application rates; fertilizer stabilizers, etc.*
- 3. have parking lots discharge to sed basins and not directly into pond or install oil collection-separator basins*
- 4. have city increase maintainence of roadway to remove sand/debris/oil residues early in the spring and avoid spring rain flushing of roads into the pond; make area salt free road zone; have energy dissipators/sed basins or concentrated wetland plantings at water discharge locations in the pond*
- 5. ensure that all embankments are well-vegetated with non-invasive species to avoid/minimize bank erosion*

c. Name two (2) wetland-dependent species that would be benefited by these techniques and how they would be benefited. (1 pt each)

Species

Benefit

- 1. green/bull/no.leopard/other amphibs increase/ensure habitat quantity by avoiding filling, increase water quality for egg/larval survival; decrease parasite loads with decreased nutrients*
- 2. all turtles - increase habitat quantity, increase soil quality for egg laying, increase sediment quality for brumation*
- 3. wetland dependent bird species - scrub/shrub border barriers will provide nesting, resting, food habitat, decrease predation, increase cover, etc.*