

2006 NEW HAMPSHIRE ENVIROTHON: FISH AND WILDLIFE TEST

SECTION I - Wildlife Identification [1 pt each]

Team #: _____

Calls

1. Cardinal
2. Mockingbird
3. Robin
4. Wood Frog
5. Barred Owl
6. Northern Leopard Frog

Fish (Key)

7. Redbreast Sunfish
8. Brook Trout
9. Longnose Sucker
10. Atlantic Salmon
11. Shad
12. Largemouth Bass

Small Mammals (Key)

13. Short-tailed Shrew
14. Redbacked Vole
15. White-footed Mouse
16. Little Brown Bat
17. Star-nosed Mole

Larger Mammals

18. Bear (Track)
19. Raccoon (Track)
20. Bobcat (Pelt)
21. Lynx (Pelt)
22. Beaver (Pelt)
23. Virginia Opossum (Pelt)
24. Pine Martin (Pelt)

Amphibians/Reptiles

25. Fisher (Mount)
26. Musk Turtle (P)
27. Red Eft (P)
28. Northern Water Snake (P)

Birds

29. Green Heron (P)
30. Black Duck (Mount)
31. female
32. Ruffed Grouse (Mount)
33. Woodcock (Mount)
34. Osprey (P)
35. Killdeer (P)

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

Team #: _____

1: As the effects of climate change become more pronounced, biologists predict that many wildlife species will undergo shifts in the ranges they occupy. Considering the following ten wildlife species currently found in New Hampshire, indicate whether climate change could be expected to increase or decrease their range in the state and in each case give one reason to support your answer (20 pts).

Species	Increase/Decrease?	Why?
Canada Lynx	<u>decrease</u>	<u>loss of boreal habitat</u> <u>loss of primary prey (snowshoe hare)</u> <u>increased competition with bobcat</u>
Virginia opossum	<u>increase</u>	<u>warmer winter temperatures allow them</u> <u>to survive over the winter</u>
Great Blue Heron	<u>increase</u>	<u>increase – generalist, does not rely on</u> <u>boreal species, has shown range</u> <u>expansion north</u>
Bobcat	<u>increase</u>	<u>as snowfall decreases during the winter</u> <u>bobcats will have increased winter</u> <u>survival</u>
Moose	<u>decrease</u>	<u>less tolerant of increases in summer</u> <u>heat. Already showing signs of heat</u> <u>stress in summer in NH</u>

Section III

Team #: _____

Species	Increase/Decrease?	Why?
White-tailed Deer	<u>increase</u>	<u>greater winter survival as snow depths</u> <u>decrease</u>
Eastern Cottontail	<u>increase</u>	<u>displace snowshoe hare</u> <u>change in habitat favors cottontails</u> <u>generalist</u>
Northern Mockingbird	<u>increase</u>	<u>warmer winters</u>
Boreal Chickadee	<u>decrease</u>	<u>loss of habitat</u>
Northern Cardinal	<u>increase</u>	<u>warmer winters</u>

Section III

Team #: _____

2a: Name two anadromous fish found in New Hampshire. Identify two different climate change related factors and explain how they might impact the populations of anadromous fish that you identified (6 pts).

Fish Species: alewife, herring, shad, Atlantic salmon

Factors: less well-defined spring peak due to reduced extent and duration of snowpack could change the patterns of migration (outmigration timing shift, upstream migration too late or weak), increased summer stream temperatures make some rivers too warm to support species, salt water intrusion as sea levels rise.

Impacts: All impacts noted above will decrease survival of anadromous fish.

2b: Trout have specific water temperature requirements. For each species listed below, determine 1) whether the species is a native of NH and 2) can they survive in water over 75° F (4 pts).

	Native? (Y/N)	Survival over 75° F? (Y/N)
Brown Trout	___N___	___Y___
Brook Trout	___Y___	___N___

2c: Wetlands provide valuable functions. List three functions of wetlands (6 pts).

- a) ___ flood storage, wildlife habitat, pollution attenuation, groundwater recharge,
- b) ___ nutrient removal, streambank stabilization, recreation
- c) _____

2d: How are vernal pools different than wetlands and why do they provide critical breeding habitat for many species of amphibians (4 pts)?

___vernal pools are ephemeral and wetlands are permanent

___vps have no fish

Section III

Team #: _____

3: Sea levels are expected to rise as the climate continues to change. Name five positive or negative changes that may occur to coastal wildlife habitat and explain how each change will affect at least one type of wildlife (10 pts).

The increase in sea level will likely increase armoring of barrier beaches. Revetments, groins, and similar structures interfere with the natural migration of sand along the coast

Loss of salt marshes and tidal flats (loss of important salt marsh nesting areas due to sea level rise)

Increasing sea levels will likely change the balance between different habitats within the salt marsh (less high marsh and more low marsh and salt pans)

The balance between salt and fresh water could change

correlation between warmer seawater temperatures and the decline in the intensity of the spring phytoplankton bloom

The migration patterns, spawning success, and juvenile survival of many fish and marine invertebrates are sensitive to changes in water temperatures.

4a: Name one effect that climate change might have on the timing of certain life stages of insects (2 pts).

insects emerge earlier in the spring _____

4b: How would that effect mentioned above affect bird and fish populations (4 pts)?

timing of migration becomes out of synch, birds arrive after peak of emergence, fish

energetic needs not met – less fit individuals, less young, decreasing population.

4c: What process allows animal/plant populations to survive in a changing environment (2 pts)?

adaptation, evolution, natural selection, acclimation _____

4d: What critical factor determines whether an animal/plant can adapt to a changing environment (2 pts)?

change has to happen slowly enough so that species can adapt _____