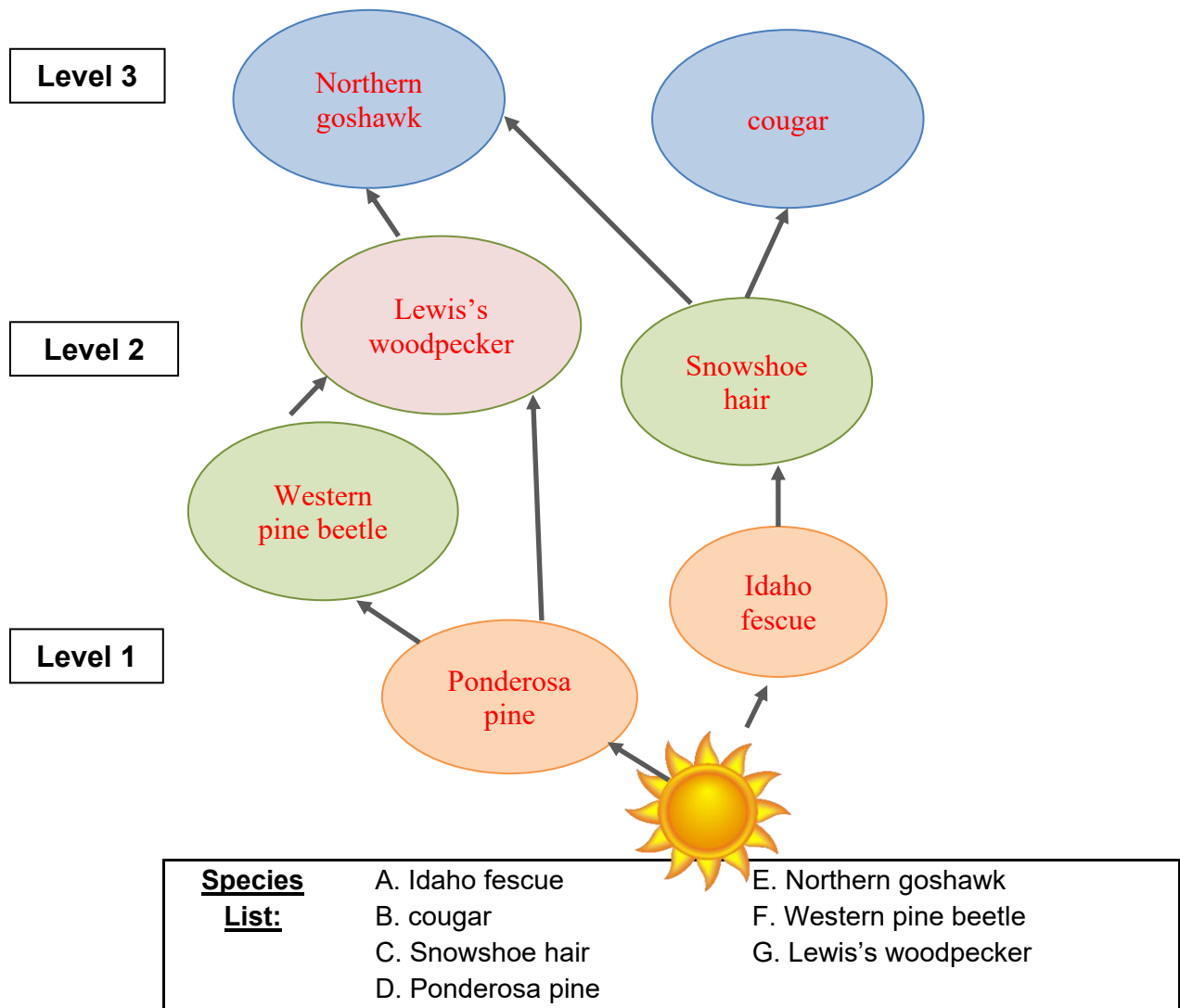


Part 1: Wildlife Ecology Concepts

1-7. Energy flows in a food web. In the diagram below, place each listed species into a circle to form a logical food web for a **Ponderosa Pine Woodlands Ecosystem**. Please note that the diagram represents three trophic levels with sunlight captured at Level 1, and that the arrows point in the direction of energy flow (the direction of the consumer). [7 points]



8. Which trophic level is most likely to be affected by bioaccumulation? [1 point]

___ Level 3 ___

9. Which trophic level of this food web has autotrophic organisms? [1 point]

___ Level 1 ___

___ / 9 points

Part 2: Wildlife Management Issue – Monarch Butterflies in the West

Refer to this article to answer questions 10-17: “Monarch Butterflies in Western North America” by David G. James.

10. Studies on the sub-lethal impacts of neonicotinoids (such as Clothianidin) on butterfly larvae have reported which of the following? [1 point]

- a. Reduced weight and body length of first instar larvae
- b. Increased period spent as first instar larvae, resulting in 50% mortality
- c. Early instar larvae gradually turned gray
- d. **a and b**

11. What is the likely source of high levels of neonicotinoid contamination due to application rates that are 40 times greater than recommended? [1 point]

Home garden plants

12. Neonicotinoids are highly systemic compounds that are readily transported through the vascular system of plants. What four parts of plants contaminated with neonicotinoids can poison herbivores feeding on them? [2 points, 0.5 each]

Stems, leaves, flowers, or seeds

13. What are two likely dissemination routes of neonicotinoid exposure to pollinators like butterflies? [2 points, 1 each]

Nectar and pollen

14. Neonicotinoids have the ability to move away from sites of application through water, _____ **air** _____, and _____ **soil** _____, which provide the potential for widespread landscape contamination. [2 points]

15. Table 1 in the article displays monarch butterfly counts at overwintering sites in California. Figure 3 depicts mean daily maximum temperatures. In what year were temperatures high and the total reported monarchs low? [1 point]

2020

____/ 9 points

16. In December of the year in Question 15, at what coastal location did citizen scientists find large numbers of monarch eggs and larvae? [1 point]

San Francisco Bay Area (or just San Francisco is okay)

17. What shift for western monarchs might be indicated by the absence of butterflies at overwintering sites and the presence of novel breeding populations in urban areas? [2 points]

Possible shift in overwintering strategy (or just overwintering strategy)

Part 3: Wildlife Interaction

Refer to the book The Sibley Field Guide to Birds of Western North America.



Both birds (Species A and Species B) are found in Oregon. Only one of them is a native species in Oregon. The other is a non-native species that was introduced from Europe.

18. Give the common name of Species A [1 point]. European starling
19. Give the scientific name of Species B [1 point]. *Progne subis*
20. What season is Species B observed in Oregon? [1 point] Summer
21. Species B is part of a family of aerial songbirds with long pointed wings and that feed almost exclusively on flying insects (or insects). [1 point]
22. These two species are both cavity nesters and use the same limited nesting habitats. How would you describe the interaction between them? Circle the best answer. [1 point]

Mutualism Predation Parasitism Commensalism **Competition**

 / 5 points

Part 4: Skins, Skulls, and Bones

Your test station should have **field guides/materials** to help answer the following.

23. Examine and identify the set of **6 skins** of animals that are **all found in Oregon**. Match the **letter** attached to each **skin** to the correct mammal species in the list below. [6 points, 1 point each]

<u> B </u> Virginia opossum	<u> C </u> American mink
<u> </u> elk	<u> </u> gray fox
<u> D </u> northern river otter	<u> </u> coyote
<u> </u> red fox	<u> </u> long-tailed weasel
<u> A </u> short-tailed weasel	<u> </u> northern raccoon
<u> </u> nutria	<u> E </u> American Badger
<u> </u> deer	<u> F </u> yellow-bellied marmot

24. Examine the **four animal skulls** displayed on the table (**be gentle with them**) and assign each to the appropriate mammal family. [4 points, 1 point each]

<u> D </u> Felidae (cats)	<u> A </u> Castoridae (beavers)
<u> C </u> Mustelidae (weasels)	<u> </u> Didelphidae (opossums)
<u> </u> Canidae (dogs, foxes)	<u> B </u> Cervidae (deer, elk)
<u> </u> Mephitidae (skunks)	<u> </u> Procyonidae (coatis, raccoons)

- 25a. Compare the two skins and give the scientific name for each. [2 points, 1 each]

A. Lynx rufus

B. Canis Latrans

- 25b. The skull is from one of these species. Circle the species it belongs to. [1 point]

A

B

 / 13 points

Part 5: Identifying Tracks and Sign

Use the picture and the track provided to identify the species for each sign.
Reference: Scats and Tracks of the Pacific Coast

Sign A



See “TRACK A” for reference

Background. This species creates scent mounds. Its scat is marshmallow-sized and a little longer than thick.

Questions:

26. What is the scientific name of this species? [1 point] *Castor canadensis*
27. What is the ecological term for this species, which is also a masonry term? [1 point] Keystone species
28. Name one similar species found in this species' habitat and describe differences in their tracks. [1 point]
Differs from river otter by long slender toes, pointed heal, and lacking chevron-shaped pad

 / 3 points

Sign B



See “TRACK B” for reference

Background: This species’ habitat is frequently backwater eddies along riverbanks and shallow edges of lakes.

Questions:

29. What is the common name of this species? [1 point] Canada Goose

30. How does webbing on cormorant tracks differ from “Track B”? [1 point]

Has webbing between toes 1 and 2

 / 2 points

Part 6: Species Identification

Use the Wildlife of the Pacific Northwest field guide to help you identify the species pictured below and on the following pages.

Species A. [2 points]



Photo credit: ODFW

Species A is nocturnal and well-adapted for travel in deep snow.

31. What is the scientific name of Species A? [1 point] Martes americana
32. In high-elevation conifer forests, Species A depends on the complex structure of standing, leaning, and fallen trees that create spaces under snowpack for hunting and thermal regulation when resting. [1 point, 0.5 each]

 / 2 points

Species B. [2 points]



Photo credit: USFWS

Species B prefers low- to mid-elevation dense forests. Wildlife managers attempted to stabilize its population numbers through several reintroduction efforts in the late 20th century.

33. Species B is larger and heavier than Species A and will prey on porcupines. What is the common name of Species B? [1 point] _____ **Fisher** _____

34. What are two reasons that populations of Species B have plummeted in our region in the last century? [1 point, 0.5 each]

_____ **Habitat destruction or loss (or clear cutting or overharvesting)** _____

_____ **Fur trapping** _____

____ / 2 points

Species C. [2 points]



Photo credit: USFWS

Species C are swimmers and strongly associated with water and riparian habitats.

35. What is the common name of Species C? [1 point] _____ **Mink** _____

36. Name two types of prey that make up its diet. [1 point, 0.5 each]

_____ **Any of the following: mouse-sized mammals (or just mouse/mice), muskrats, small fish, birds, eggs, insects, crayfish, and garter snakes** _____

_____/ 2 points