



Montana Outdoors Magazine Literacy Evaluation Program

“Interconnected”

name: _____

1. A strain of the HPIA arrived in Montana in 2022. How did it get here?

2. List four types of organisms that could be adversely affected by the HPIA.

3. Besides HPIA, which wildlife diseases have arrived in Montana since 2010?

4. What is the name of the program that Montana FWP looks to for expertise regarding wildlife diseases, and where is this program located?

5. Necropsies done by wildlife veterinarian Dr. Jennifer Ramsey and technician Matt Becker at the Wildlife Health Lab are an important tool for understanding wildlife diseases. What are necropsies, and what can be learned from them?

6. How can an arterial worm kill a moose?

7. The title of the article is “Interconnected.” What are the three interconnected entities in the “One Health” approach to managing diseases?

8. According to disease ecologist Dr. Emily Almberg, what are three possible ways humans may have contributed to the increase in wildlife diseases in Montana?

9. According to Almberg, what is the precondition that makes wildlife especially susceptible to a new disease?



Montana Outdoors Magazine Literacy Evaluation Program

10. List three examples of wildlife diseases that illustrate Alberg's point (see answer to previous question).

11. Describe the "spill over" that caused multiple die-offs of bighorn sheep in recent years.

12. Why are the words "spill back" appropriate for the concern about wildlife infecting cattle with brucellosis?

13. What are "zoonotic diseases"? List four examples.

14. How can diseases that cause fish die-offs or reduced hunting opportunities cause problems for human communities?

15. What are three ways wildlife management agencies (like Montana FWP) can reduce the effects of disease on wildlife?

16. Which two agencies work together to test elk for brucellosis?

17. What are two things that people might notice that they should report to their local FWP office or the FWP Wildlife Health Program?

18. Most wildlife are _____, and most game meat is _____. But there is good reason to be paying _____.



Montana Outdoors Magazine

Literacy Evaluation Program

Read page 33 of the article and then answer the questions below.

19. After you butcher an elk, moose, or deer, why is it important to dispose of the leftovers in a Class II landfill?

20. How might salt blocks and other attractants contribute to the spread of CWD?

21. How might cave explorers (spelunkers) carry white-nose syndrome from one cave to another?

22. What are three things bird hunters should do to prevent spreading avian influenza (bird flu) to pets or people?

23. What should you do if you see bighorn sheep or mountain goats that look sick?

24. Even though rabbit hemorrhagic disease does not infect people, why should you avoid contact with sick or dead feral (wild) rabbits?



Montana Outdoors Magazine Literacy Evaluation Program

1. The third page of the handout is optional (questions 19-24). It focusses on the “What you can do to help” portion of the article on page 33.
2. Here are some possible bell-ringers:
 - a. Ask students what wildlife diseases they have heard of, and then show students the 2-minute YouTube video titled “Wildlife Diseases” (search “Wildlife Diseases MontanaFWP). <https://www.youtube.com/watch?v=Inx-A02WtcE>
 - b. Ask them . . . What is the term highly pathogenic avian flu is commonly known as? Explain what “highly pathogenic” means. What is a pathogen?
3. There are several acronyms used in the article. It might be helpful to go over them, possibly listing them on the board for reference: FWP, CWD, HPAI, WNS, WHP, USDA, DOL, DPHHS
4. Give students a copy of the article. Have them read it silently, read it as a class, or read it to them.
5. If the assignment seems to be too much for the grade level you teach, consider assigning a certain number of questions (you decide how many, and each student gets to pick which ones they answer). Any questions they answer correctly beyond the required number can count as extra credit.

Answer Key

1. HPAI was brought here by migrating birds, possibly waterfowl.
2. HPAI can harm domestic poultry, some species of wild birds, dairy cows, and humans.
3. rabbit hemorrhagic disease, white nose syndrome, COVID-19, chronic wasting disease
4. The Wildlife Health Program, and it is located in Bozeman.
5. A necropsy is an autopsy done on a dead animal. A necropsy can often determine what sickened or killed the animal.
6. An arterial worm can cut off the blood flow to the moose’s head/brain.
7. wildlife, livestock, people
8. People moving pathogens and animals around, people changing the landscape in ways that push animals into new contacts with other species, people raising large numbers of domestic animals for agriculture.
9. The most dangerous pathogens are ones that wildlife have never been exposed to before.
10. White nose syndrome, CWD, Sylvatic plague
11. A pneumonia-causing bacteria was transmitted from domestic sheep and goats to bighorn sheep.
12. Originally brucellosis was transmitted to bison and elk from cows. Now that cattle herds are free of brucellosis the fear is that they may be infected by elk or bison carrying the disease.
13. Zoonotic diseases are ones that can be transmitted from animals to humans, including rabies, plague, tularemia, and HPAI.
14. People spend money in local businesses when they come to an area to hunt or fish.
15. Protect habitat, reduce sources of stress or mortality, adjust hunting seasons or quotas.
16. Montana Department of Livestock, FWP
17. They should call if they are not sure their meat is safe to eat, and if they see an animal that looks unhealthy.
18. healthy, wholesome, attention
19. Class II landfills bury the waste deep in the soil, shielding it from contact with other animals.
20. Salt blocks and food causes animals to congregate, increasing the risk of disease transmission.
21. The spores that cause white-nose syndrome cling to clothes, shoes, and gear, and can stay viable for years.
22. Students should choose 3 of the 7 bulleted items listed on page 33.
23. Report this to the nearest regional FWP office.
24. Rabbits can carry other diseases that do pose a risk to humans.



Montana Outdoors Magazine Literacy Evaluation Program

Possible Extension: The bar code on page 32 links to a website (fwp.mt.gov/conservation/diseases) with more detailed information about various fish and wildlife diseases. Assign a disease to each group (or individual), and have them do a short report to the class. Have them read the information provided on the website, and then find other sites with more information, photos, maps, etc. to include in their presentation.

Possible Assessment: See below. Put these two lists on the board, or have students list them on their own paper. Connect the disease to the animal - as a class review exercise or as an individual quiz.

Draw a line from the disease to the animal that is most vulnerable to it.

Bats

Pneumonia

Deer

White Nose

Bighorn Sheep

Chronic Wasting Disease

Trout

Whirling Disease

Rabbits

Rabies

Songbirds

Covid

Cows

Brucellosis