

EQ #5-

How has Wolf Reintroduction affected ecosystems and people?



WEDNESDAY 1/15/20

- How are wolves ecologically important as keystone species?
- How does their presence affect their ecosystem?
- What is a trophic cascade?
- How have wolf behaviors caused a trophic cascade in Yellowstone NP?
- Work Time on ESA Basics Foldable Assignment-

Wolves Fast Facts

- Canis lupus
- Mammal
- Carnivore
- Head and body 3-5 ft
- Tail 13-20 inches
- Weight 40 to 175 lbs
- Life span 6-8 years



Wolves

- Gray Wolves once populated large portions of North America, Europe and Asia but **were hunted to near extinction.**
- Few gray wolves survive in Europe though many live in Alaska, Canada and Asia
- This map shows where wolves are found today (in the US).



Wolf Socialization

- Wolves live and hunt in packs of 6-10
- They roam large distances--up to 12 miles in a day
- They cooperate to kill their preferred prey--large animals like deer, elk and moose. They also eat birds, fish, lizards, snakes and fruit.
- When they kill an animal, they eat it all. A single wolf can eat 20 pounds of meat at a sitting!



History of Wolves

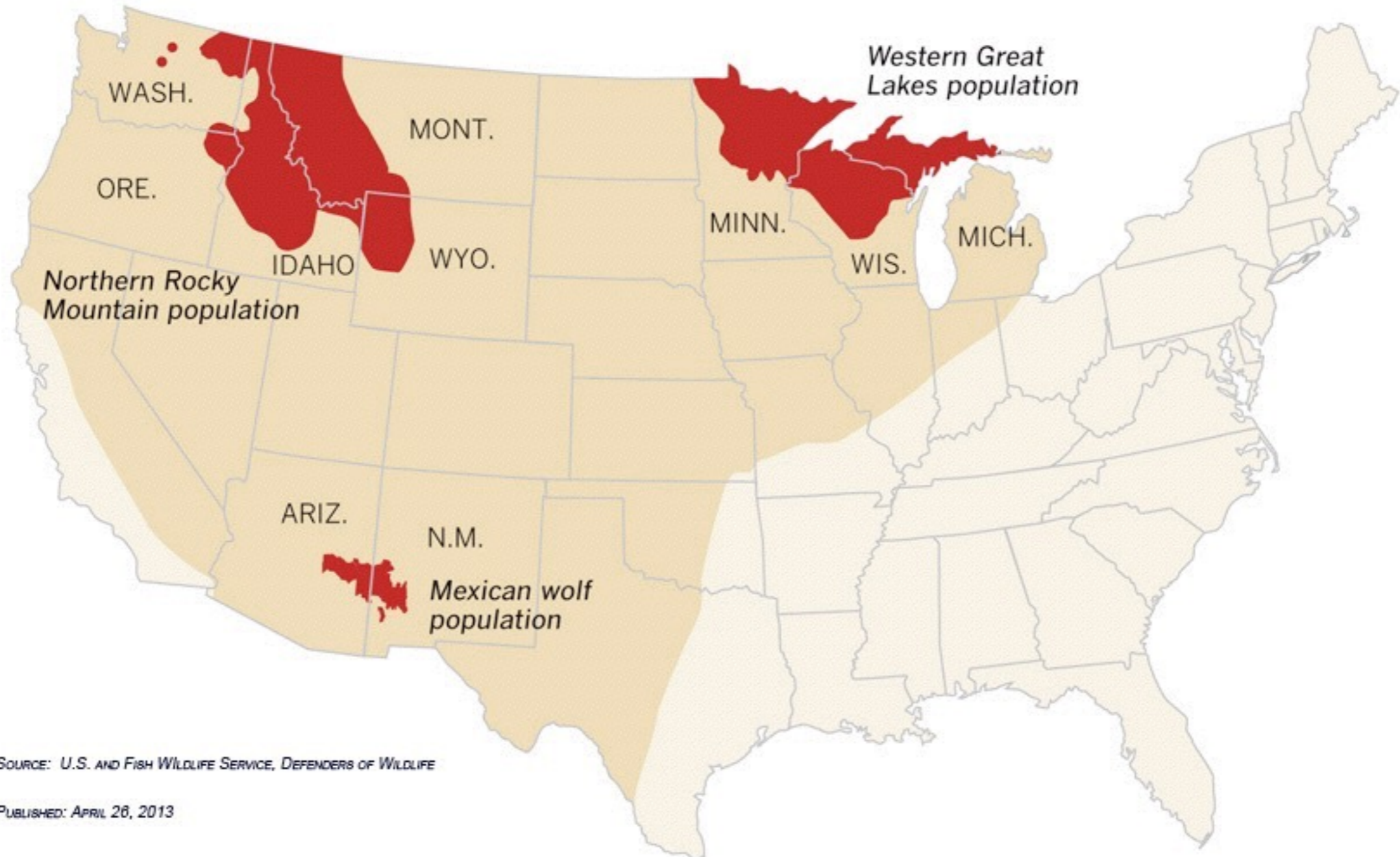
- Wolves lived in North America for hundreds of thousands of years.
- As many as **250,000** inhabited the lower 48 states.
- Many indigenous people revered wolves.
- Most were wiped out through over hunting by the 1920s
- Gray wolves were hunted to extinction in the Rocky Mountains and Western states; some remained in the Great Lakes area.

Wolf Distribution Then and Now

Wolf distribution

■ Current range

■ Historic range



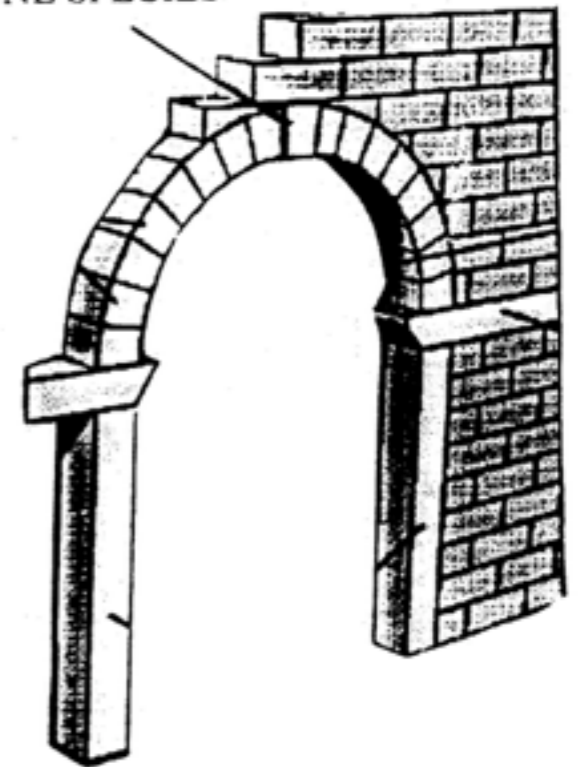
SOURCE: U.S. AND FISH WILDLIFE SERVICE, DEFENDERS OF WILDLIFE

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Ecological Importance of Wolves- What is a **KEYSTONE** Species?

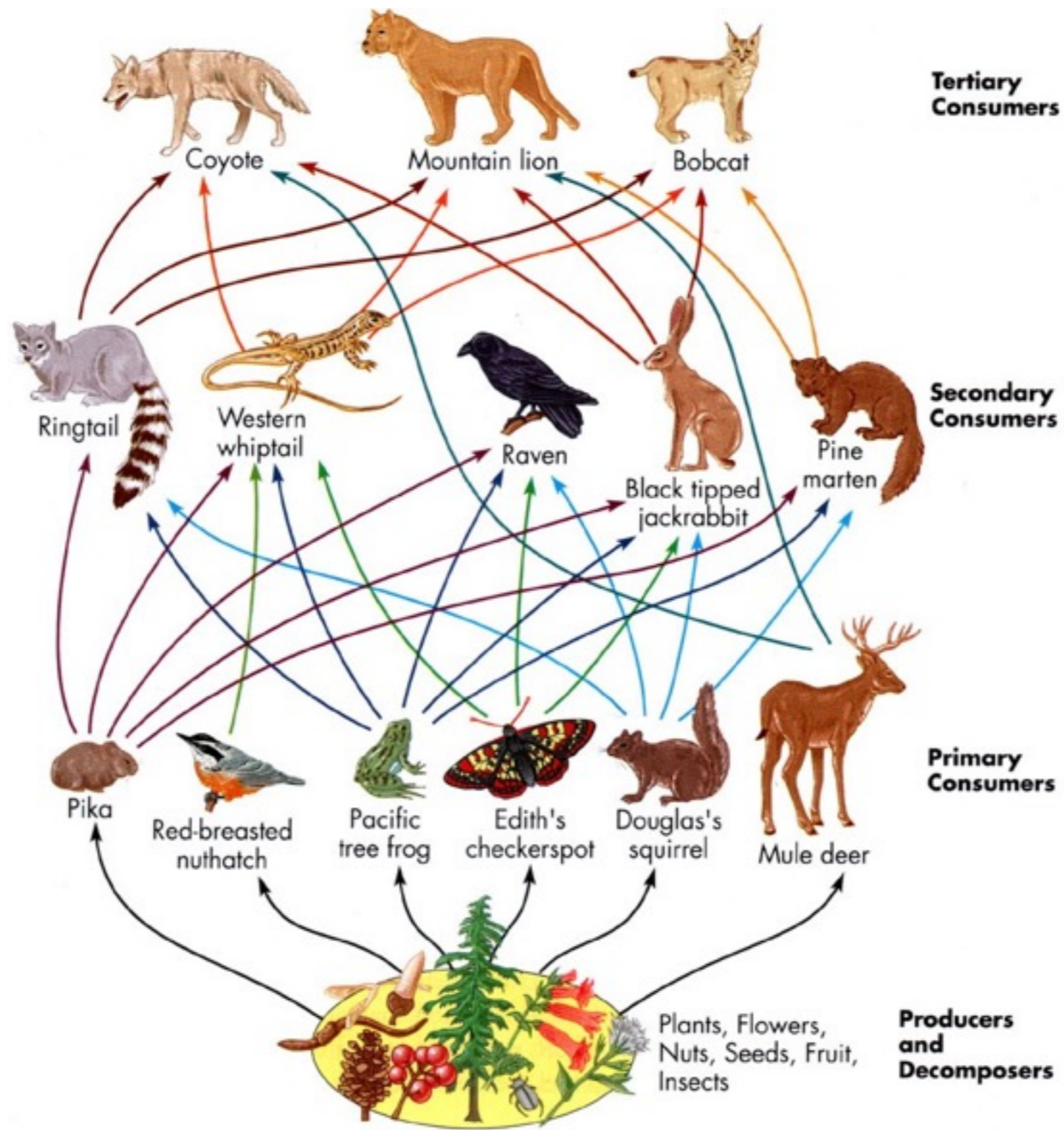
- Wolves are a **Keystone Species**--they have a disproportionately large effect on their environment relative to their abundance.
- How are they a **Keystone Species?**
- They play a critical role in maintaining the ecology of their habitat.
- They affect the behavior of many other organisms
- They help determine the types and numbers of other species in their community.

KEYSTONE SPECIES



Trophic Levels- Review

- In a food web, Trophic Level describes what an organism eats (like stock animals eat from a “trough”)
- **1. Plants /producers-** make their own food from the sun; are at the first trophic level.
- **2. Herbivores / primary consumers-** eat plants; are at the second trophic level.
- **3. Omnivores/secondary consumers-**eat both plants & animals; are at the third trophic level.
- **4. Tertiary Predators** - eat mostly other animals; are at the top of food chain; fourth trophic level



What is an Apex Predator?

- A **predator** is a (mostly) carnivore that eats other animals.
- **Apex** means “top” or “highest.”
- Wolves are an **Apex Predator**-
are at the top of food chain with
few or no predators in its ecosystem.
- They can be killed and eaten by stronger members of their own kind...but not generally hunted by other species.



What is a Trophic Cascade?

- Refers to the effects that apex predators have on their food webs and ecosystems by
 1. Suppressing the populations of their prey
 2. Or forcing a change in the behavior of their prey due to their presence
- This can cause unexpected advantages to the food web.

How Wolves Change Rivers

- Watch film clip on wolves and their affects on rivers.
- Write up FOUR ecological benefits of wolves to their environment
- www.youtube.com/watch?v=ysa5OBhXz-Q

Work Time- ESA Success Stories Activity

- Get a computer
- Use sites to answer prompts about ESA species

THURSDAY 1/16/20

- Review Film- *How Wolves Change Rivers*
- How are wolves keystone species in their environment in Yellowstone?
Describe specific ways
- What are the conflicts between humans and wolves?

Ecological Importance of Wolves



- **1. HERD HEALTH**

- Wolves eat herd animals (deer, elk, antelopes, caribou) as prey--often choosing young, old, physically impaired or diseased animals.
- This has made herds more resilient against disease and improved overall health of herds

More Ecological Benefits of Wolves

- 2. Improved plant habitat near rivers and wetlands.
 - Without wolves, elk browse heavily along rivers and wetlands without fear of predation;
 - Vegetation was overeaten by browsers.
 - Now, wetland and riparian (streamside) habitats are rebounding!



Ecological Benefit from Wolves

- **3. OTHER SPECIES RETURN to use the riparian (stream side) habitats as they grow back.**
- **Beavers** return to river valley areas as trees grow back
- **Scavengers** benefit from food left over by wolves there.
- **Songbirds** return as more trees grow back.



Ecological Benefits of Wolves- RIVERS

- **4. RIVERS IMPROVE**

As trees and shrubs grow back in river valleys, river banks stabilize and form deeper pools as they channelize and meander less.



- This reduces erosion and increases stream flow.

Pair Debrief Discussion Q's- Wolves, Trophic Levels & Keystone Species

- 1. Give an example of a 3rd trophic level organism.
- 2. What is an example of a primary consumer?
- 3. What is an example of a producer?
- 4. Wolves are apex predators. Describe TWO reasons why.
- 5. Why are wolves considered KEYSTONE SPECIES? Describe TWO ways.
- 6. What is a trophic cascade?

Wolves Ecological Benefits in Yellowstone NP

- <http://www.bbc.com/future/story/20140128-how-wolves-saved-a-famous-park>

Wolf Reintroduction in Yellowstone

- Wolves had been extinct in Yellowstone NP and the West since 1920s
- In 1995, 14 wolves were released into Yellowstone NP and 17 more in 1996 in order to reestablish their presence in the Park.
- The wolves came from Canada where they were captured for the release program.
- **ACTIVITY- WOLF REINTRODUCTION**
Read the article and mark it up. We will do partner questions afterwards.

Partner Questions- Yellowstone Wolf Release

- 1. What was the soft release? Why did they do that?
- 2. Who funded wolves return to Yellowstone? Why?
- 3. How many wolves are in Yellowstone today? Other western states?
- 4. Are wolves “recovered?” In what ways yes? In what ways no?
- 5. Are wolves killing livestock in the west? Explain.
- 6. Why is there greater animosity towards wolves today?

Conflict with Humans- How many wolves now? How many humans?

- As wolves increase in number through recovery efforts, conflicts with humans are on the rise.
- US population in the west is growing
- Conflicts are inevitable.



How has the ESA affected Wolf Populations?

- Due to protected status under the ESA, wolf populations have recovered dramatically from extinction in the Western states,

- | <u>Area</u> | <u># of Gray Wolves</u> |
|-------------|-------------------------|
|-------------|-------------------------|

- Great Lake States (Michigan, Wisconsin, Minnesota) 3722

- **Western States (ID-770, MT-554, OR-77, WA-48, WY-333) 1782**

- Alaska (NOT protected) 7700-11,200

- (As of 2014)

Conflict with Humans

- As wolf numbers are rebounding in the west, human populations in western states are increasing.
- Wolves need a large range of habitat and space to live.
- Conflicts may be inevitable...



What are the Conflicts between Wolves and Humans

- Wolves have killed ranchers' livestock and can threaten human safety
- They compete with hunters for big game (elk and moose)
- *Is it time to end their federal protection as an endangered species?*

Friday

- ESA Basics- Review and Foldable Poster

ESA REVIEW- Foldable

- Create a Foldable Review Poster that summarizes the key points of the ESA
- Use your notes and handouts to answer Guided Q's
- Record information on your Foldable Review Poster

Tuesday- January 21, 2020

***Wolf Controversy-**

-Ecological and Cultural Effects

*Stakeholder Perspectives

*Listing / Delisting Pros & Cons

Wednesday-Wolves Role Play & Wrap-Up

Thursday- ESA Unit Review

Friday- Unit Test: ESA & Wolves

Yellowstone Wolf Reintroduction

Project Q & A

- Keystone Species graphic for INBs (pass out to students)
- Watch the film clip
- <https://www.youtube.com/watch?v=dMGJ9oThHbc&index=1&list=PLisZI9TmeASLYnF7wioxlccnFJciFRvT1>

Wolf Numbers in the West Today

- View the handout about Wolf Numbers today in the US (excluding Alaska)
- Highlight numbers in Oregon and other important data from the handout

Wolf Delisting

- Read the handout about the Trump Administration's plan to de-list wolves from protection under the ESA
- Discuss with partner & Write up FIVE important take-aways from the article

Wednesday- Wolves Stakeholder Debate

- What are the effects of wolves, after their return, on communities in the West?
- Consider wolf reintroduction from various stakeholder perspectives
- Write your arguments with your stakeholder group
- Present Arguments in Town Hall Meeting format
- Reflection- Should Wolves be Delisted from ESA?

Wolf Stakeholder Activity

- Form a group of THREE and get an assigned interest group
- Research and brainstorm your group's perspective about wolf reintroduction
- Prepare a response to the statement— **The Gray Wolf has recovered and should be delisted from the ESA.**
- **Does your stakeholder group agree or disagree?**
Form and write up THREE key arguments in support of your group's position. **Each argument should be one paragraph (3-5 sentences) in length.** Be prepared to read your arguments to the class.

Wolf Stakeholder Statements

- Read your group statements from the Role Play
- What is the status of wolves today? Are they still protected under the ESA?
- Was wolf reintroduction a success? In what ways yes? How no?
- Wolves in Oregon—how many?
- Study Guide Work time Unit 2

STAKEHOLDER SHARE OUT

- READ YOUR ARGUMENTS
- Other groups can ask questions and respond directly to presenting group
- We will vote as a class as to which stakeholder group you agree with most
- **Reflection / Response-** What do you personally think should happen with future wolf management in the western states of the US? Should wolves be delisted? What are your concerns? Are there any solutions that you would recommend when conflicts happen?

Activity- Wolves in Oregon

- Use the ODF&W site to read the Wolves in OR FAQ's
- <http://www.dfw.state.or.us/Wolves/faq.asp>
- Review ALL of the FAQ's.
- Record TEN key facts from the site in your INB LEFT Side.

Thursday- Unit Wrap Up

- Complete Unit Study Guide- **ESA & Wolves**
- Complete **ESA Foldable Review** assignment
- **Complete INB EQs #4-5**—make sure all notes & summaries (at least FIVE sentences) are finished.
- **Unit Test Tomorrow (FRIDAY)!**

Wolf Re-Introduction to Yellowstone

- Do the ecological benefits wolves provide to their ecosystems outweigh their risks to humans and livestock?
- **Watch Film Clips from Wildlife Biologist Doug Smith.** Record info about the FAQ on your graphic organizer as you watch.
- <https://www.nps.gov/yell/learn/photosmultimedia/qa-wolves.htm> and <https://www.youtube.com/watch?v=dMGJ9oThHbc&index=1&list=PLisZI9TmeASLYnF7wioxlccnFJciFRvT1>

Wolves in Yellowstone Film Clips

- <https://www.nps.gov/yell/learn/photosmultimedia/qa-wolves.htm>
- For each film clip, write notes with question and answer in C-Notes format.
- NOT USED THIS YEAR (2020)