Lesson Overview: Students consider their thoughts and feelings about wildland fire before and after a photo presentation. Then students read and analyze a chapter from a book about the fires of 1988 in Yellowstone National Park.

Lesson Goal: Increase students’ understanding that wildland fire is a complicated process, has complicated effects, and may generate complicated feelings.

Objectives:
- Students can use images to make observations and inferences about wildland fire.
- Students can describe and discuss information about the impacts of the 1988 fires in Yellowstone National Park.

Questions:
1. Introduction to Wildland Fire in the Northern Rocky Mountains and North Cascades

Teacher Background: If you walk through a recently burned area, you will probably encounter some places where all the vegetation looks dead and other places that have a lot of green vegetation left. You will probably see deep holes in the ground where roots have burned away and also patches of leaf litter that is barely scorched. You may also see homes that have burned, fences and outbuildings destroyed, washed-out roads, or burned bridges.
Wildland fire can be a powerful force for renewal or destruction – or both. Fire behavior and fire effects vary with topography, weather, and vegetation. The impacts of wildland fire on people and human communities vary as well. As an introduction to the study of wildland fire, this photo presentation highlights variation in fire behavior and its relationship to people and human communities.

This curriculum focuses on fire ecology and the challenges that people face when living with fire. It features especially the ecology and management of 3 kinds of forest that occur in the northern Rocky Mountains and the North Cascades: forests at low elevations dominated by ponderosa pine and Douglas-fir, middle-elevation forests dominated by lodgepole pine mixed with subalpine fir and other trees, and high-elevation forests of whitebark pine mixed with subalpine fir.

Materials and preparation:
• Make a copy of the technical reading Exerpts_YellowstoneInTheAfterglow.pdf for each student or arrange for them to read it online at (https://www.nps.gov/yell/planyourvisit/upload/full-2.pdf). This technical reading is 5-7 pages long. Students do not need to write on the handout so, if you are making printed copies, consider printing a classroom set to use repeatedly.
• Make a copy of Handout H01-1. Reading “Yellowstone in the Afterglow” for each student.
• Download the presentation H01_WildlandFireObservations.pptx.

Procedure:
1. Hook: Ask students to take out a sheet of paper and make a list of pros (good things) and cons (bad things) about wildland fire.

2. Have students share what they wrote. Ask which column has more written in it and why. This discussion may draw out some strong feelings about wildland fire.

3. Ask students to turn their paper over and divide it in half. Label one half “Observations” and the other “Questions.” Go through the presentation H01_WildlandFireObservations.pptx (below). The photos are arranged in 5 groups. Stop after each group of photos and ask students to add items to (a) their lists of observations and questions and (b) their list of pros and cons. If students want to back up and revisit some photos, that is OK.
Wildland fire: Observations & Questions

Photo by Rick Trembath. Used with permission.

Theme: houses burning/burned

Photo Group #1
Houses

USDA Forest Service photo provided by Cathy Stewart.

USDA Forest Service photo provided by Jack Cohen.

Photo provided by Rick Trembath. Used with permission.
Slide 7

Photo Group #2
Low-severity fire

Theme: low-severity fire

Slide 8

Photo Group #3
Stand-replacing fire

Theme: stand-replacing fire
Slide 11

Slide 12

Slide 13

Slide 14

Slide 15

Theme: postfire photos

Photo Group #4
After
4. Ask students to share their observations and questions. Ask for any items that they added to their lists of pros and cons during the presentation.

5. For the reading assignment, students will need to understand the terms “ecosystem” and “ecological community,” so review: An ecological community includes all of the living things in an ecosystem – plants, animals, fungi, and microorganisms. An ecosystem includes the living things plus the nonliving parts of the ecosystem, such as soil, water, and air.
6. Give each student a copy of *Exerpts_YellowstoneInTheAfterglow.pdf* or arrange for them to read it online ([https://www.nps.gov/yell/planyourvisit/upload/full-2.pdf](https://www.nps.gov/yell/planyourvisit/upload/full-2.pdf)). Break the class into five groups and assign of these sections to a different group:
   - “A Tale of Two Fires” and “Fire as an Ecological Event”
   - “Fire as a Human Experience”
   - “Yellowstone in the Year 2000”
   - “The Debate Continues”
   - “Yellowstone’s Clouded Crystal Ball”

7. Give each student a copy of Handout H01-1. Reading “Yellowstone in the Afterglow”. Explain: Students in each group will become experts on the questions about their section and will answer ONLY the questions about their section on the handout. Have them do the reading and write answers to the questions on their section.

8. Regroup the class so each new groups has at least 1 student from each of the 5 original groups. Have students from each group share their answers to the handout with the rest of the group, while students NOT in that original group ask questions and take notes on THEIR handouts.

9. Ask students to discuss connections among their pro-con lists, the presentation, the article, and their answers to the final question on the handout.

**Assessment/Evaluation**: Because this is an introductory lesson meant to evoke diverse thoughts and feelings about wildland fire, this activity does not have an assessment or evaluation.
Handout H01-1. Reading “Yellowstone in the Afterglow”

Name: ___________________

Instructions: Please use “Yellowstone in the Afterglow” by Mary Anne Franke to answer the following questions in complete sentences.

“A Tale of Two Fires” and “Fire as an Ecological Event”

1. Define each of these terms as it is used in the article: millennium, alleged, subterranean, intrinsic.
2. What are the “two fires” that the author discusses?
3. The author suggests that people should think of Yellowstone as a place that is always changing. What is one of her examples of things that may change?
4. How did most of Yellowstone’s wildlife respond to the fires?
5. What does the author think is the main reason to accept the presence of fires in Yellowstone?

“Fire as a Human Experience”

1. Define each of these terms as it is used in the article: futile, repository, feasible, mission.
2. What were the two conflicting messages (“mixed smoke signals”) that park managers sent during the fires?
3. What did the firefighting efforts accomplish?
4. Describe two of the hardships for people that the fire caused.
5. Why does the author say that it is not logical to eliminate fires?

“Yellowstone in the Year 2000”

1. Define each of these terms as it is used in the article: proximity, aptness, trifling, gateway.
2. The author suggests that the fires were not as “cataclysmic” as other events in Yellowstone. Describe the example she gives.
3. What are dead trees good for?
4. How did the numbers of park visitors change during the year of the fires (1988) and afterward?
5. When this article was written, how were Yellowstone’s managers handling lightning-caused fires?

“The Debate Continues”

1. Define each of these terms as it is used in the article: prescription burn, hazardous fuels, conflagration, incompatible.
2. Describe the first big fire in the West during the year 2000.
3. What was one criticism of government fire management at the end of the summer of 2000?
4. Why does the author consider fires important to Yellowstone?
5. What is the “one indisputable benefit” of the 1988 fires?

“Yellowstone’s Clouded Crystal Ball”

1. Define each of these terms as it is used in the article: quantifiable, runoff, fire breaks, debris flows.
2. How could large fires cause flooding? Have the 1988 fires caused this in Yellowstone?
3. How could large fires cause another “big fire season” in Yellowstone after 1988? Did this happen?
4. What kinds of trees are growing in the areas burned by the 1988 fires?
5. How have people’s attitudes toward wildland fire changed since the 1988 fires?
Handout H01-1. Possible responses to questions about “Yellowstone in the Afterglow”

### “A Tale of Two Fires” and “Fire as an Ecological Event”

1. Define each of these terms as it is used in the article: millennium, alleged, subterranean, intrinsic.

2. What are the “two fires” that the author discusses?
   1. The ecological event that burned a huge area of Yellowstone in 1988
   2. The human event, including economic and emotional impacts

3. The author suggests that people should think of Yellowstone as a place that is always changing. What is one of her examples of things that may change?
   The Old Faithful geyser can be changed by what happens underground. Severe winters can change the number and distribution of plants and animals. So can fire.

4. How did most of Yellowstone’s wildlife respond to the fires?
   Most of them did not flee, but instead they went about their activities as usual. Few were killed by smoke or flames.

5. What does the author think is the main reason to accept the presence of fires in Yellowstone?
   The main reason is because fires are intrinsic to Yellowstone’s ecology.

### “Fire as a Human Experience”

1. Define each of these terms as it is used in the article: futile, repository, feasible, mission.

2. What were the two conflicting messages (“mixed smoke signals”) that park managers sent during the fires?
   1. Persuade the public that the fires were not an ecological disaster.
   2. Spend $120 million to try to put them out.

3. What did the firefighting efforts accomplish?
   Firefighting efforts protected buildings in the park, but they did not reduce the area burned very much.

4. Describe two of the hardships for people that the fire caused.
   Here are three:
   1. Two people died.
   2. Many people were inconvenienced or worried about the park.
   3. Local businesses suffered financial losses.

5. Why does the author say that it is not logical to eliminate fires?
   Eliminating fires would be illogical because they are one of the forces that determine which plants and animals live there.

### “Yellowstone in the Year 2000”

1. Define each of these terms as it is used in the article: proximity, aptness, trifling, gateway.

2. The author suggests that the fires were not as “cataclysmic” as other events in Yellowstone. Describe the example she gives.
   Her example is the series of volcanic eruptions 630,000 years ago.

3. What are dead trees good for?
Dead trees can provide shelter and a source of food for insects and birds, which then provide food for other animals.

4. How did the numbers of park visitors change during the year of the fires (1988) and afterward?

In 1988, visitation was 15% lower than in 1987. In 1989, however, visitation was higher than ever – and has continued to increase.

5. When this article was written, how were Yellowstone’s managers handling lightning-caused fires?

If lightning-caused fires did not pose a risk to human life or property, they were permitted to burn under “certain conditions.”

“The Debate Continues”

1. Define each of these terms as it is used in the article: prescription burn, hazardous fuels, conflagration, incompatible.

2. Describe the first big fire in the West during the year 2000.

In May, a prescription burn intended to reduce hazardous fuels near Bandelier National Monument burned many homes in local communities.

3. What was one criticism of government fire management at the end of the summer of 2000?

Some claimed that the government had not used enough prescription burns to prevent the fires.

4. Why does the author consider fires important to Yellowstone?

The author considers fires important because they are an essential to the Park’s nature; they are needed to “let Yellowstone continue to be Yellowstone.”

5. What is the “one indisputable benefit” of the 1988 fires?

The fires have provided the opportunity to learn how the Park has responded – both the people and the wild inhabitants of the Park.

“Yellowstone’s Clouded Crystal Ball”

1. Define each of these terms as it is used in the article: quantifiable, runoff, fire breaks, debris flows.

2. How could large fires cause flooding? Have the 1988 fires caused this in Yellowstone?

Increased water flow (“runoff”) from burned hillsides could have caused flooding, but this did not happen after the 1988 Yellowstone fires.

3. How could large fires cause another “big fire season” in Yellowstone after 1988? Did this happen?

The many dead and down trees could have fueled another big fire season, but they didn’t.

4. What kinds of trees are growing in the areas burned by the 1988 fires?

Millions of lodgepole pine seedlings are growing in burned areas, and aspen seedlings are growing in places where they did not occur before the fires.

5. How have people’s attitudes toward wildland fire changed since the 1988 fires?

People seem to better understand and accept the fact that fires have a role to play in wildlands.