

EXPLORATION: FIRES ARE NOT ALL BAD!

Grades 3-5



ENDURING UNDERSTANDING:

Wildfires may cause several changes to the tundra or forest. But many of these changes are helpful to the animals and plants that live there, including the trees!

Part 1 (30 minutes)

STUDENT DIRECTIONS

You will read a brief explanation about the different types of wildfires and how they can actually be helpful to plants and animals. Take notes on the benefits of wildfires. Afterwards you will answer 3 questions and then write an essay to reflect on your understanding of the impacts of wildfires on plants and animals.

NGSS STANDARDS:

3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment

Fire can be scary, especially when homes are threatened, but fire can also be very helpful to the forest or tundra! Some plants and animals love a fire!

WILDFIRES CAN BE FIERCE OR MILD.

A wildfire may be very hot and fierce, or a wildfire can be mild and not last very long. The type of wildfire depends on the kinds of trees and plants that are growing in the area, as well as what the weather is doing and the amount of time that has passed since the last fire.



High Intensity Fire

DIFFERENT FIRE TYPES HAVE NAMES.

Fire scientists call a powerful wildfire that kills most of the trees and plants a high intensity fire, while low intensity describes wildfires where only some of the plants

Written for ANROE by Lilly Goodman-Allwright

Alaska Natural Resources and Outdoor Education (ANROE) www.anroe.net

EXPLORATION: FIRES ARE NOT ALL BAD!



burned. But really most wildfires are a mixture of high and low intensity.

After 2004, Alaska's largest fire year on record, scientists counted how much land had been burned at a high intensity. They learned that of the six and a half million acres that burned that summer, only a small fraction (about 216,000 acres, or 4.5%) of all the land that had burned had been high intensity!



Low Intensity Fire

WILDFIRES CAN HELP PLANTS GROW!

A team of fire ecologists (scientists who study wildfires) compared three different forests – a forest that had been heavily burned, a lightly burned forest, and a forest that had not burned at all. They found that plants in the lightly burned forest were growing better than plants in the un-burned and heavily burned forests. The lightly burned forest had the most light, space, water and nutrients. The plants in the lightly burned forests were growing like crazy!

SOME ANIMALS LIKE FIRE, OTHERS DON'T.

Most wildlife depend upon plants in some way or another, so if plants are affected, wildlife are too. For example, red squirrels need spruce trees for food so they may need to find another place to live after a fire. But moose love a forest that has just burned, because they like to eat the kinds of plants that grow after a fire. Three-toed woodpeckers flock to a burned area because they love the long-horned beetles that eat the burned trees.

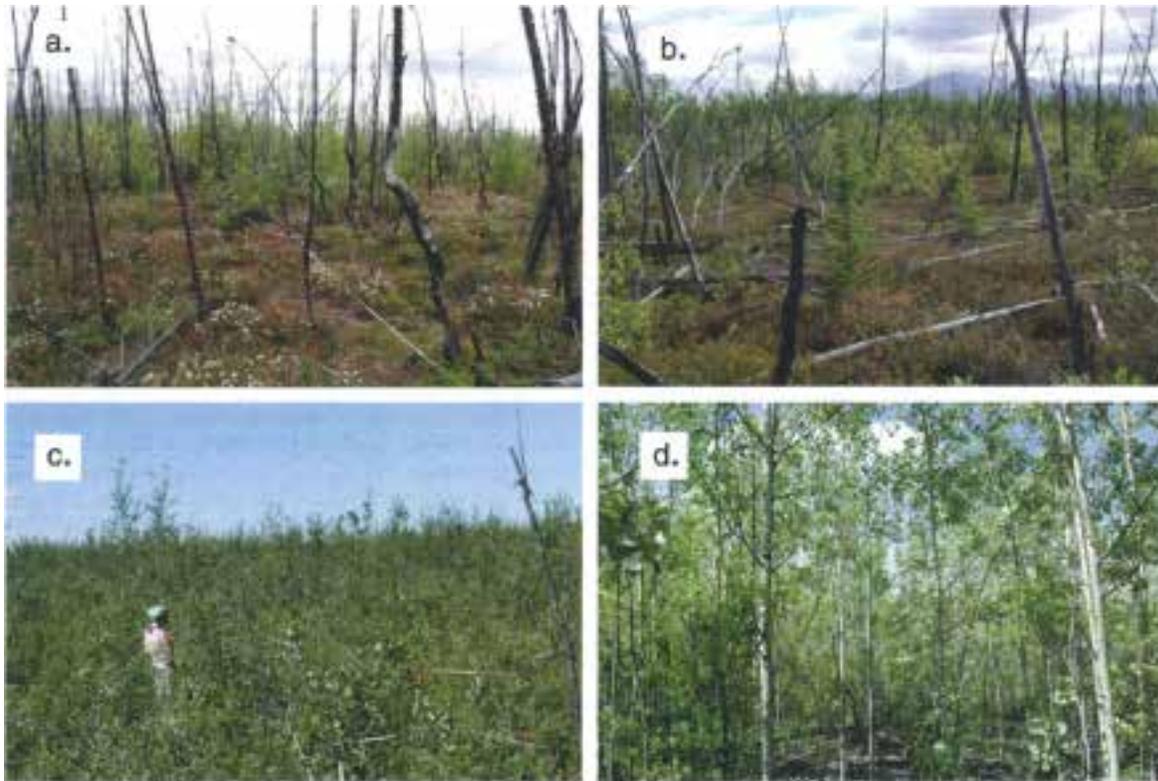


EXPLORATION: FIRES ARE NOT ALL BAD!



SOONER OR LATER IT ALL GROWS BACK.

Whether a wildfire is fierce or mild, plants and trees will grow back. It just might take a little bit longer after a heavy fire. Only one year after the 2014 Funny River Fire on the Kenai Peninsula, the forests were filled with fireweed and young willow shrubs (take a look at the Kenai Wildlife Refuge's [Refuge Notebook](#)). Fifteen years after the Donnelly Flats fire near Delta Junction, the forest was dense with four-foot high spruce trees!



Ground photographs showing differences in post-fire regeneration occurring in study sites used for a boreal forest regrowth study¹. (a) 1994 burn site dominated by willow shrubs and black spruce seedlings; (b) 1987 burn site dominated by black spruce saplings and willow shrubs; (c) 1994 burn site dominated by aspen seedlings and willow shrubs; and (d) 1994 burn site dominated by aspen saplings. All photographs taken by E. Kasischke in the summer of 2008.



Left: Fireweed and shrubs regenerate among weakened trees one year after the fire (credit KENWR).

Right: Fireweed regenerates after the fire off the Dalton Highway



EXPLORATION: **FIRES ARE NOT ALL BAD!**



MY NOTES

What are the benefits of wildfires?

Benefit	Details

EXPLORATION: FIRES ARE NOT ALL BAD!



Part 2 (30 minutes)

STUDENT DIRECTIONS

You will now have 30 minutes to review your notes and sources, plan, draft and revise your essay, which will be based on the essay topic below. You may use your notes and refer to your sources, but please work on your own! You may also refer to the answers you wrote to earlier questions, but you cannot change those answers. Now read your assignment and the information about how your essay will be scored, and then begin your work!

ESSAY TOPIC:

In 2004, wildfires covered six and a half million acres – Alaska’s largest fire year. The news kept talking about “catastrophic wildfires”. Do you think the word “catastrophic” painted an accurate picture of the wildfire season? Why or why not? Write a letter to the news station telling them whether or not they should change the words they use to describe the fires. Use examples and scientific information that would back up your statement. Your essay should be about five paragraphs.

Part 3 (15 minutes)

SCORING YOUR ESSAY

Your essay will be evaluated based on:

1. **Organization:** How well you included an introduction, reasons that are supported with details, and a clear conclusion.
2. **Use of examples to support your opinion:** How well you used various examples and scientific information to explain your opinion and new concepts.
3. **Scientific accuracy:** How accurate the facts were that you presented.
4. **Language and vocabulary:** how well you used precise language and vocabulary to explain your opinion.

How well did you think you did? Score yourself by giving yourself 1-5 (5 is highest and 1 is lowest) for each of the above evaluations.

- | | |
|------------------------|-------|
| 1. Organization | _____ |
| 2. Examples | _____ |
| 3. Accuracy | _____ |
| 4. Language and Vocab. | _____ |
| TOTAL | _____ |

EXPLORATION: FIRES ARE NOT ALL BAD!



Follow-up activity: How intense would a wildfire be if it happened in your area today?

You can help to figure out whether a wildfire, if it happened in your area today would probably be high intensity or low intensity.

1. Put a check mark by each item in the table that is true.
2. Count the total check marks in each column and put your answer in the TOTAL row.

	Low Severity Likely	Medium Severity Likely	High Severity Likely
How dry are the live fuels?	Lichens and mosses feel soft and fleshy	Lichens and mosses are soft but a bit crunchy	Lichens and mosses crumble in your hands
	Leaves on trees and bushes are soft an fleshy	Leaves feel thin and are starting to get crunchy	Leaves crumble in your hands
How green are the leaves on the trees?	Leaves are green	Leaves are yellowish or reddish	Leaves are brown or yellow-brown
What kinds of fuels?	Flowers and grass	Mostly deciduous trees and brush	Mostly spruce trees
How thick are the fuels?	Trees and brush are more than 7 meters apart	Trees and brush are 1-7 meters apart	Trees and brush grow close to each other - (less than one meter apart)
How much forest litter (needles, leaves, branches, etc.) is on the forest floor?	Surface litter (stuff that hasn't started to decompose yet) buildup is less than 1/2 cm deep	Surface litter buildup is 1/2 - 2 cm deep	Surface litter buildup is more than 2 cm deep
How hot is it?	Leass than 50 ⁰ F (10 ⁰ C)	50 - 70 ⁰ F (10-20 ⁰ C)	More than 70 ⁰ F (21 ⁰ C)
How much moisture is in the air?	Rainy or misty or feels very humid	Overcast or rained within last 2 days	Dry
How windy is it?	No wind - calm	Breexy - from 5-20 mph, you feel wind on your face, leaves are rustling, small branches may be moving	Windy - more than 20 mph. Small trees are swaying
Total (add up all the check marks in each column)			
How severe is a wildfire likely to be?	CIRCLE WHICH COLUMN HAS A SCORE LARGER THAN 4		

EXPLORATION: **FIRES ARE NOT ALL BAD!**



Part 4 OTHER RESOURCES

Funding for this project was made possible by a partnership with the USDA Forest Service