

GLOSSARY

active layer: the layer of ground above the permafrost that freezes and thaws each year.

adaptation: something about an organism that helps it survive and reproduce; an aspect of its form, function, or behavior that helps it out-compete other organisms.

Alaska Wildland Fire Coordinating Group: a group formed in 1998 to continue developing specific fire management plans for lands in Alaska. This Coordinating Group consists of representatives from federal and state agencies, Native organizations, and local governments.

annual production: the total amount of biomass produced through photosynthesis in one year by the producers of a given area.

bark: the tissue covering stems, branches, and roots of a tree or shrub, extending from the cambium to the outer surface.

boreal forest the largest and northernmost forest ecosystem in the world. In Alaska the boreal forest occurs predominantly in the interior and is characterized by spruce, aspen and birch tree species.

botanist: a person who studies plants

broad-leafed tree: a tree that has wide, flat leaves, as opposed to needle- or awl-shaped leaves. Most broad-leafed trees in the northern U.S. drop their leaves in the fall.

bud: Plants have two kinds of buds. One kind is the flower bud, which is the developing flower—not yet open. The other kind, and the meaning used in *FireWorks*, is any starting point for plant growth. This kind of bud is often called a growing point; a technical term for it is meristem tissue. It may grow at the tips of tree and shrub branches, at the tips of roots, in the cambium layer of trees, at the bases of flower and plant stems, and in many other locations. Buds are composed of living cells.

bulb: an underground storage organ in a plant. A bulb has roots on its lower surface and fleshy leaves above. Perennial plants are able to reproduce from their bulbs.

burrow: a hole in the ground used by an animal for shelter.

canopy fire a fire in the upper forest canopy.

canopy fuels all green and dead materials located in the upper forest canopy including tree branches and crowns, dead standing trees (snags), moss, and high brush.

cambium: a thin layer of living cells beneath a tree or shrub's bark. The cambium layer produces two kinds of cells: those that carry water and minerals from roots to leaves (xylem), and those that carry sugars and other nutrients from leaves throughout the plant (phloem).

carbon dioxide: one of many gases in Earth's atmosphere. Carbon dioxide (CO₂) is produced by combustion and respiration

carnivores meat eating consumers.

cavity: a hole in a tree stem; often used by animals for nesting and shelter

cavity nester: an animal that raises its young in a tree cavity.

cell: the basic unit of living things, the smallest living part of an organism that can make new living parts. Some organisms have only one cell, but most plants and animals that we are familiar with contain millions of cells. In a complex organism, some cells are alive, and some are no longer alive but are used by the organism for structural support or other functions.

charred fuel: fuel that is partly burned, with its outside surface blackened.

combustion: the process of burning; the process of combining a substance with oxygen and a heat source, which produces heat and light.

community: in ecology, all of the living things that occupy a habitat; the populations of all species in a given habitat. In social science, all of the people who reside in one area, are subject to the same laws, and have the same interests.

condensation: the change of a gas to liquid or solid form; the change of a liquid to solid form.

cone: the "package" in which a conifer stores its seeds; reproductive structure of a conifer.

conifer: a tree that bears cones and has needle-like or scale-like leaves.

consumer an organism that obtains energy and minerals by eating (consuming) other living things; includes herbivores, carnivores, omnivores, and detritivores.

control: the aspects of an experiment that are held constant so they will not affect the experiment's outcome; a standard of comparison against which scientists check the outcome of experimental treatments.

convection: the diffusion of heat through a liquid or gas by means of molecular motion. Because gases expand when heated, much of the heat from a fire diffuses upward from a burning surface through the process of convection.

critical management option an Alaska management option assigned to lands where human lives and property require that immediate, top priority fire protection be provided. Fires on these lands will be given unquestioned priority in the allocation of fire-fighting funds, manpower, and equipment. Fires will be immediately and aggressively suppressed.

crown: a tree's top, where most of the leaves and above-ground buds are found.

crown fire: fire that spreads in the crowns of trees and shrubs. Crown fires are usually ignited by surface fire. They are common in coniferous forests and chaparral-type shrublands.

decadent declining or decaying. A decadent forest is over mature and in the final stage of succession.

deciduous: a kind of plant that is able to shed its leaves in the fall or when it becomes very dry.

decomposers: organisms that help dead plants and animals decay.

decomposition the process of decay, or breakdown, of organic materials such as dead plants or animals and waste materials.

defensible space an area you create around your home or cabin that is free from burnable materials.

dendrochronology: the use of tree growth rings to learn about the approximate dates of past events.

density: the number of plants or animals in a given area, for instance, trees/m²

detritivore an organism that eats dead organic material; used as a synonym for decomposer or scavenger.

dichotomous key: an identifying system that continually divides the characteristics of the objects to be identified into two branches or parts.

dispersion: the process of scattering or spreading, often used to refer to the way in which smoke disperses through the atmosphere

diversity a variety of plants and animals living within an ecosystem.

duff: partially decomposed organic matter lying beneath the litter layer and above the mineral soil; consists of dead and decaying leaves, branches, wood, and other plant parts.

ecology: the study of plants and animals in relation to their environment.

ecosystem: all living and nonliving things in an area of any size, with all parts linked together by energy and nutrient flow.

edge the area where different successional stages of plant growth or plant communities overlap.

embryo: a plant or animal in the early stages of development after fertilization.

energy: the power to make things move or change. Physicists call energy the ability to overcome inertia and to do work. Energy is transferred in many ways, including by heat, light, and chemical reactions including those of photosynthesis and respiration.

EPT insects: insects especially sensitive to changes in their environment, thus good indicators of water quality. EPT stands for the scientific orders Ephemeroptera (mayflies) Plecoptera (stoneflies) and Trichoptera (caddis flies).

exoskeleton: the hard material that forms the outside of an insect's body and provides its support.

experiment: an activity in which observations are used to test an hypothesis. An experiment is often designed with two groups of subjects. One group is subjected to a treatment to discover its effects; the other group, the control, is not subjected to the treatment and is used as a basis for comparison.

field site: location in an ecosystem where plants and animals can be observed, measured, or studied.

filled seed: seed that contains a plant **embryo** so a new plant can grow from it. Unfilled seed did not complete the process of fertilization and embryo development, so it cannot develop into a new plant.

fire the state or process of combustion, or oxidation, in which ignited material combines with oxygen and gives off light, heat, and flame. A source of ignition (heat), oxygen, and fuel is required for a fire to burn.

fire frequency the time period in which a fire is most likely to occur; Alaska's fire frequency is as often as every 50-100 years.

fire impact: the overall effect of fire on an ecosystem. In Alaska, fire impact is determined by the amount of organic soil material removed by a fire.

fire intensity: term used to describe the amount of heat fire produces. Low intensity refers to slow burning, cool fires, where not all fuels are consumed; moderate intensity is a faster burning, hotter fire where most small fuels are consumed; and high intensity fires burn very fast and hot, consume large fuels, are harder to contain and often travel great distances.

fire interval the length of time that passes between natural fires in a given area.

fire line: a line constructed for fire control by removing all vegetation and scraping away the organic layer down to mineral soil.

fire management: Actions to prevent wildland fires, suppress them, or manage them for particular purposes, such as improvement of wildlife habitat.

fire regime: the pattern of fire occurrence, size, and severity in an area or ecosystem. An ecosystem's fire regime is like a story about the forces of fire, climate, human use, and species adaptations—all interacting to affect the ecosystem over thousands of years.

fire season the time of year when fires are most prevalent. In Alaska this is usually from June to September.

fire scar: a wound at the base of a tree caused by heat damage to the cambium. Fire scars are usually shaped a little bit like triangles. They are often blackened in the center and pitchy around the edges. The tree continues to grow, so its bark gradually curls over the edges of the scar and sometimes buries the scar completely.

fire suppression the art and science of putting out fires.

firestorm: a wildland fire that results from **convection**, caused by a very large, intense fire or many fires that burn together. A firestorm usually produces a towering smoke column, **spot fires**, and spinning, tornado-like winds.

fire triangle the term used for the three components needed to start a fire: fuel, oxygen, and heat.

flagging limp or drooping branches. Usually caused by heavy snowfall, wind, or avalanche.

flammability: the ease with which something will start on fire

foliage: the leaves of a plant.

food chain the pathway of energy and nutrients from the nonliving parts of the ecosystem, through the living parts, and back to the nonliving environment.

food web many interconnecting food chains.

forester: a person who studies forests and is concerned with their management, use, and enjoyment.

fuel: the living and dead vegetation that can be burned in a wildland fire. Fuel includes dead woody material, leaves of trees and shrubs, litter, duff, grasses, and other plants.

fuel moisture: the amount of moisture in fuels, expressed as a percent or fraction of oven dry weight. Fuel moisture is the most important fuel property controlling flammability.

fungus: a consumer organism that decomposes living and dead organisms by digesting their tissues and absorbing the nutrients they contain. Mushrooms and mold are kinds of fungus.

full management option an Alaska management option which includes lands with high cultural or historical values or other resource values that landowners or managers determine to need fire protection. These lands are generally uninhabited. On lands classified for full protection, all fires will be aggressively fought throughout the fire season.

fungi organisms in the Kingdom Fungi, including mushrooms, molds, rusts, mildews, and rots. Lichens are also included in this kingdom, although they are formed by the symbiotic association of fungi and algae or certain bacteria.

gas: a state of matter in which molecules can move quite freely, can expand indefinitely, and are not bound in a particular structure. If cooled sufficiently, gases form liquids or solids.

ground fire a fire that not only consumes all the organic material--duff---on the forest floor, but also burns into the underlying soil, mostly by smoldering combustion. Fires in duff, peat, dead moss and lichens, and punky wood are typically ground fires.

ground fuels all combustible materials lying at or below the ground surface, including deep duff, roots, rotten buried logs, and other woody fuels.

growth ring: annual layer of growth in a tree. Ecologists and foresters use growth rings to learn about the climate and fire history of a forest.

habitat: the place where an animal lives that provides food, water, cover, and space in the proper arrangement; the natural home of a plant or animal.

heartwood: central woody core a tree trunk. Heartwood provides structural support to the tree. It is made up of dead xylem cells; it contains no living cells and does not help transport water, as sapwood does.

heat: a form of energy that raises the temperature of matter -- usually required to start reaction between fuel and oxygen, creating fire.

heat heavy burn most or all of the organic material in the soil is burned. All plants have been burned.

hedging the process of creating short busy shrubs or trees by repeated removal of the terminal (end) buds of the plant.

herbivore a consumer that obtains energy and minerals by eating producers such as plants.

herb stage the stage of succession that contains seed plants whose stems wither away to the ground each winter.

heterotroph: organism that obtains nutrition from plants and animals; heterotrophs are not capable of photosynthesis.

histogram: a graph of the frequency distribution of observations.

hydrocarbons air pollutants containing hydrogen and carbon that are released during wildland fire.

hypothesis: a tentative explanation for something that is observed and can be tested; a guess at what the outcome of an experiment will be.

insulation: material that absorbs heat slowly and releases it slowly, so it can be used to protect an object from rapid heating or cooling.

inversion: atmospheric conditions in which temperature increases with height above the ground.

ladder fuels: shrubs and small trees that fill the space between the forest floor and tree crowns with flammable material, so a fire might be able to "climb the ladder" from surface fuels into the treetops.

lateral bud the buds found on the side of the branch.

leaf: a plant structure that can capture energy from sunlight and store it in the chemical bonds of sugars and similar compounds; the main location of photosynthesis in plants.

lichen a combination of fungi and one or more algae living symbiotically in a mutualistic arrangement.

light burn a burn where the organic layer of soil remains mainly intact.

limited management option a Alaska management option category that recognizes those areas where a near-natural fire regime is desirable, or where the resource values at risk are worth less than it would cost to launch a fire fighting effort. On these lands, fires are only monitored unless they threaten lands in other higher-valued categories or critical sites within the area. Suppression action then will be taken if the responsible land management agency deems it necessary.

limiting factor: those things that may influence the success of an animal, its population, or its species. These include air, water, space, food and their quality as well as predation (by humans and animals) or disease.

liquid: a state of matter in which molecules can move quite freely and can flow, but do not expand indefinitely, as a gas can do. If cooled sufficiently, liquids form solids.

long term effects: effects that are long-lasting.

litter: the top layer of the forest floor, not yet decomposed. Litter includes freshly fallen leaves, needles, fine twigs, bark flakes, fruits, matted dead grass and other plant parts that are little altered by decomposition.

management goals: the conditions desired for a wildland area in the future.

management plan: the methods to be used for meeting management goals.

management policy the policy made by management that determines the course of action or non-action taken with regard to wildlife and habitat.

mature aging forest stage when the hardwood trees become mature and eventually die, being replaced by spruce, leaving the forest with a wide variety of tree species, sizes, and ages (also referred to as old growth or decadent). The final stage in forest succession.

mature forest stage a forest where many of the trees have grown from saplings into mature trees.

meristem: plant cells that are not specialized yet, so they can develop into many different kinds of cell. Buds contain meristem tissue.

meteorologist: a person who studies weather and changes in the atmosphere. Meteorologists sometimes use their skills to forecast weather and fuel conditions that affect wildland fire behavior.

microscopic organisms members of the Protist and Monera Kingdoms. Includes bacteria, algae, and protozoans.

mineral a naturally occurring element or compound.

mineral soil: soil that contains no organic matter

model: an object made to represent something that already exists or is being designed, or a set of mathematical equations that represents hypothesized relationships

moderate burn burns some of the organic material in the soil. Logs may be deeply charred.

modified management option the Alaska management option that serves as a buffer area between Full and Limited management option areas. It includes lands where fire protection is needed during critical burning periods (unusually dry months), but where fires are otherwise desirable. On these sites, immediate fire-fighting action is taken if conditions indicate that a large fire could occur (generally during the first and drier part of each fire season). If the fire cannot be contained the first day, an escaped fire situation analysis (EFSA) will be made to determine levels of continued action. When the danger is deemed low due to wetter conditions, no initial attack is made on new fire starts, and these lands are treated much like those in Limited management option areas.

moisture requirement: the amount of moisture needed for an organism to survive

mosaic a patchwork of vegetation in which two or more types of plant communities are interspersed in an irregular pattern (see vegetation mosaic).

natural resource manager an individual whose job is to make decisions about uses and treatment of natural resources to ensure that the benefits of these are maintained for present and future generations of people.

natural selection: concept developed by Charles Darwin; the process by which organisms that are well suited to their environment reproduce successfully and are more numerous in the next generation, and organisms of that are poorly suited to their environment do not succeed as well.

needle: a long, narrow kind of leaf

nonliving components air, water, soil, energy; the physical surroundings of an ecosystem; the nonliving components of an ecosystem form the base of all food chains in that ecosystem.

nonrenewable resources: nonliving resources such as rocks and minerals; resources that do not regenerate themselves; substances such as petroleum, coal, copper, and gold, which, once used, cannot be replaced.

nutrient a naturally occurring element or compound (mineral) needed by living organisms. Some important nutrients are nitrogen, phosphorus, potassium, magnesium, and calcium.

old growth forest: the final stage in forest succession.

omnivore a consumer that obtains energy and minerals by eating a variety of things, including producers, other consumers, and dead organisms.

organic material: the material that comprises living and dead things; (also the name for complex chemical compounds that contain carbon). Decaying organic matter is an important part of soil.

oxidation the combustion, or burning of any material. Oxidation breaks down organic material into raw minerals and energy (which is released in the form of heat).

oxygen: one of many gases in Earth's atmosphere. Oxygen is produced by photosynthesis and is used in both combustion and respiration.

parasite: an organism that obtains nutrients directly from a host plant or animal. A parasite does not usually benefit its host organism.

perennial living from year-to-year.

permafrost: permanently frozen soil beneath the surface soil layer, typical of arctic and subarctic environments. The thickness of permafrost ranges from just a few centimeters to over 1000 meters.

phloem: the outer layer of cells produced by a woody plant's **cambium**. Phloem cells carry sugars and other nutrients from photosynthetic tissue (mainly leaves) to other parts of the plant.

photosynthesis the process by which chlorophyll-containing cells in plants convert sunlight energy into chemical energy and make organic energy from inorganic compounds (make carbohydrates from water and carbon dioxide); this process is accompanied by the release of oxygen.

physicist: a person who studies matter and energy. Physicists investigate light, sound, heat, mechanics, electricity, radiation, and magnetism.

pingo a conical-shaped mound of earth or gravel generally found in arctic regions, as much as 65 m high and 1000 m in diameter, presumably formed from frost action.

plant: a many-celled organism that uses **photosynthesis** to capture energy from sunlight and store it in the chemical bonds of sugars or other food molecules.

PM-2.5, PM-10: the weight (in micrograms) of smoke particles less than 2.5 (or 10) microns in diameter per cubic meter of air.

polygon a hexagonal or block arrangement of surface soil forming part of a uniform pattern and often caused by alternate freezing and thawing of the earth's crust.

prescribed fire (burn) a carefully monitored fire occurring in a pre-selected area; a prescribed fire may be ignited by fire managers or by lightning.

producers organisms that can use energy and minerals from the nonliving environment to make food. Most plants and some microscopic organisms are producers. They "produce" food through photosynthesis.

pyrogenic tundra a tundra area where lush plant growth caused by fire decreases the depth of the active layer due to increased vegetative insulation; this prevents the re-establishment of trees that survived on the site before the fire.

range manager: a person who manages grasslands or areas containing a lot of grass. Range managers often plan and control grazing of grasslands.

reforestation reseeding or planting trees in an area after a burn.

renewable resources living resources, such as plants or animals, which have the capacity to renew themselves when conditions for survival are favorable.

resources a portion of the environment upon which people have placed or assigned value, or see as being available for use.

rhizome a a creeping stem of a plant that grows in the duff or soil. Rhizomes send out roots from their lower surface, and leaves or shoots from their upper surface.

reproduction: the process by which a plant, animal, or fungus produces a new organism of the same species.

respiration: the process in which living cells obtain energy by breaking down carbon compounds and combining them with oxygen, releasing carbon dioxide and water.

riparian: living near the banks of a river or creek.

root: the underground portion of a plant that absorbs moisture, obtains nutrients from the soil (and may store them too), and provides support.

sack fry: small fish with egg sack attached.

safety zone: an area around a building that contains little fuel and is large enough to protect the building from wildland fire.

sapling: a young tree

sapwood: the outer woody part of a tree trunk, which surrounds the dead, woody center (heartwood). The cells of sapwood, also called xylem cells, carry nutrients and water up from the roots to branches and leaves.

self-pruner: a tree that drops its lower limbs as it grows – e.g. ponderosa pine.

semi-serotinous: (see **serotinous**) cones are serotinous, but will also open and release seeds spontaneously over a period of years (without exposure to fire).

serotinous: late developing or late ripening of fruits (such as cones of black spruce trees). Serotinous cones are sealed by resin, and they cannot release seeds until the resin is melted by heat (usually by fire).

short-term effects: an effect that does not last long.

shrubs usually low woody plants with several permanent stems instead of a single trunk.

shrub stage the successional stage where the vegetation has moved from ground cover to shrub or bush sized vegetation.

snags dead, standing trees.

soil: the covering of Earth's surface. Soil consists of fine rock particles mixed with pieces of decayed organisms.

solid: a state of matter in which molecules are bound in a particular structure. If heated sufficiently, solids usually form liquids or gases.

species: a particular kind of living thing; the populations of organisms whose members interbreed under natural conditions and produce fertile offspring.

spot fire: a new fire that starts when burning material is carried by wind or convection ahead of an existing fire.

sprout: to put forth new growth on a plant; to grow a new plant from buds on an existing plant.

stable conditions: atmospheric conditions that do not change without energy or disturbance from outside. An atmospheric inversion is very stable.

stem: the part of a plant that holds leaves and flowers up and connects them to roots. Most stems are found aboveground but some, like rhizomes, occur belowground.

sublimation: the process in which matter changes from **solid** form to **gas** form.

succession the natural, orderly change in plant and animal communities that occurs over time when a new environment is created or an existing environment is changed.

surface fire: a fire that burns in the **litter, duff**, grasses, and wildflowers on the forest floor but does not burn in the crowns of trees. In *FireWorks*, we use the term to describe fires that do not kill the mature trees in a forest.

surface fuels all materials lying on or immediately above the ground including needles or leaves, duff, grass, small dead wood, downed logs, stumps, large limbs, and low brush.

survival: length of life; ability to outlive other organisms

terminal bud the bud on a tree found at the tip.

thermocouple: a tool used to measure temperature. A thermocouple is a junction of two metals whose voltage varies with temperature.

topography the physical features of a region or place.

thin: to cut some, but not all, trees in an area. Foresters often thin trees that are growing slowly so the remaining trees can grow more vigorously and better resist insects and fungi that would kill them or decay their wood.

trait: an inherited characteristic.

transect a straight line or profile that creates a cross-section of an area to study plants.

transpiration the process by which plants give off water through the surface of leaves or other parts.

treatment: the aspect of an experiment that is changed so its effects can be observed and measured; usually compared with an experimental **control**, in which the same aspect of the experiment is kept constant for a standard of comparison

tundra a cold climate landscape having a vegetation characterized by the absence of trees. Predominantly occurs beyond the temperature limits of tree growth, north and west of treeline in Alaska, and at elevations above treeline on the mountains; occurs in patches throughout interior Alaska.

tussocks plant form that is tufted with many stems rising from a central small mound. The base of tussocks often have accumulated dead leaves and roots.

unstable conditions: atmospheric conditions that change readily, without energy or disturbance from outside. Thunderstorms develop in unstable conditions.

vegetation mosaic a patchwork pattern of different vegetation types in various stages of succession in the boreal forest and tundra; fire helps maintain the vegetation mosaic.

visibility: a condition of the atmosphere that describes the ease with which objects at a distance can be seen and identified

volatile: evaporating rapidly at room temperature

watershed: the area that drains into a stream.

wildland: an area where the species present and the processes occurring are relatively unchanged from times before settlement by European Americans. Wildlands are often contrasted with agricultural and urban lands.

wildland fire: any fire, other than prescribed fire, occurring in a wildland

wildlife biologist: a person who studies wild animals and their habitat

wood: the tough, fibrous material that comprises tree stems and branches under the bark.

xylem: the inner layer of cells produced by a woody plant's **cambium**. Also called **sapwood**. Xylem cells carry water and nutrients (mainly minerals) from roots to leaves.

young forest stage a forest where the shrubs have been replaced with young trees.

zoologist: a person who studies animals

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- Wolff, J.O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. *Ecol. Monogr.* 50:111-130.
2000. Safe campfires in Alaska. US Government Printing Office: 2000 – 573-278/21014 Region No. 8.
2000. Protecting your home or cabin from wildland fires. US Government Printing Office: 2000 – 573-278/21013 Region No. 8.
- US Fish and Wildlife Service. *Fire in Alaska*. Fire Information and Resource Education.

SUPPLEMENTAL CURRICULA

Alaska Specific Materials

Alaska Ecology Cards from the Alaska Wildlife Curriculum

Available from Wizard Works, PO Box 1125, Homer, AK 99603, (907) 225-8757 or <http://alaskabookcatalog.com/edu.htm>.

Alaska Wildlife Curriculum Series produced by Alaska Department of Fish and Game

Available from Wizard Works, PO Box 1125, Homer, AK 99603, (907) 225-8757 or <http://alaskabookcatalog.com/edu.htm>.

Alaska Wildlife Notebook Series

Available on the web at <http://www.adfg.state.ak.us/pubs/notebook/notehome.php>

Fire Wise Community Action Program for Alaska

This Program was developed by fire professionals to improve the chances that the students, their families, and home will survive a wildfire. The video and educational materials in this program are well suited for use by teachers.

To obtain this unit contact your local land manager or:

Project Manager

Phone (907) 373- 8800

www.firewise.org

Books

Brooke, James, 1996. Damage done by wildfires is up sharply, The New York Times.

Williams, Ted, 1995. Only You Can Postpone Forest Fires, Audubon.

Cushman, John, 1995. U.S. to use fire in managing its lands, New York Times, 7/8.

Pyne, Stephen, 1995. World fire: the culture of fire on earth, New York, Henry Holt.

Yellowstone Rising Again from Ashes of Devastating Fires, Richard Stone, Science, 5 June 1998 pp. 1527-8.

Sampson, Neil, 2000. Mapping wildfire hazards and risks, Haworth Press, Inc.

Rodak, Frederick, 1991. Homeowner's guide to wildfires: in the urban interface, Wildfire Technologies. ISBN: 0963049305

Taylor, Murray, 2000. Jumping fire: a smoke jumper's memoir of fighting wildfire. ISBN: 0151005893.

Magnuson Beil, Karen, 1999. Fire in their eyes: wildfires and the people who fight them, Harcourt Trade. ISBN 0152010424.

Sipiera, Paul and Diane Sipiera, 1999. Wildfires, Children's Press. ISBN 0516264451.

Simon, Seymour, 2000. Wildfires, Morrow/Avon. ISBN 0688175309.

Web Pages Ecology and Management

National Wildland Fire Coordinating Group

www.nwccg.gov

This site has the fire information you may need, or a website that can answer your questions.

Earth Observatory

<http://earthobservatory.nasa.gov/Library/GlobalFire/>

Sponsored by National Aeronautic and Space Administration, this site explains and illustrates current global fire activity and trends.

Fire Ecology

<http://www.nps.gov/fire/educational/education.cfm>

Department of Interior, National Park Service, Fire Ecology educational awareness package. Training and education. Fire education resource material concerned with fire ecology.

Fire Effects Information System

<http://www.fs.fed.us/database/feis>

Research conducted about fire effects on plants and animals. Site maintained by USDA-Forest Service.

Fire, Weeds & Riparian Areas

<http://www.blm.gov/education/LearningLandscapes/teachers/fire.html>

Teaches fire ecology and the role of fire in ecosystems. Site maintained by the Bureau of Land Management.

Satellite Maps of Fire

<http://sd-www.jhuapl.edu/fermi/avhrr/gallery/fire/fire.html>

Johns Hopkins University site which includes interpretation of satellite-gathered information and on-line movies.

Simulating Fire Patterns in Heterogeneous Landscapes

<http://research.esd.ornl.gov/EMBYR/embyr.html>

Computer fire simulator developed after the Yellowstone Fires of 1988.

Systems for Environmental Management

<http://www.fire.org>

Contains Farsite Fire Area Simulator and FireLib, a wildfire behavior function library.

Two Sides of Fire

<http://www.forestinfo.org/>

Temperate Forest Foundation. "Two Sides of Fire" explains alternative viewpoints concerning the wildland fire issue.

Web Pages Defensible Space and Prescribed Burns

How to Conduct a Prescribed Burn, by Mike Porter

<http://www.noble.org/ag/Wildlife/prescribedburn/>

Web Pages Curriculum

Bureau of Land Management Environmental Education -
<http://www.blm.gov/education/index.html>

Agency site devoted to educational and ecological topics.

Education World

<http://www.education-world.com>

Education search engine for information and lesson plans.

Fire Ecology

<http://fire.nifc.nps.gov/fire>

Department of the Interior Fire Ecology educational awareness package. Training and education. Fire education resource material concerned with fire ecology. Located under Fire Management.

Living with Fire

http://www.fs.fed.us/rm/fire_game/

An interactive game for students, teachers and fire professionals. Developed by the Rocky Mountain Research Station, USDA-Forest Service.

Pikes Peak Wildfire Prevention Partners

<http://www.ppwpp.org/>

Provides information on FireBox curriculum. Dedicated to educating Front Range homeowners about wildfire and defensible space.

Smokey Bear

<http://www.smokeybear.com/>

Appeals to ages 6-10. Offers games and puzzles about campfire safety and forest fire prevention.

Smokey's Animal Friends: An Adventures in Education program in the Natural Science.

Teacher's Guide <http://www.fs.fed.us/r5/fire/information/index.php>

Teacher's Guide sponsored by the USDA-Forest Service and Knott's Berry Farm for grades one through six.

Sparky's Home Page

<http://www.sparky.org>

Includes Sparky's story, a fire truck section. Site sponsored by National Fire Protection Association.

Washington Department of Natural Resources Recreation and Education -

<http://www.dnr.wa.gov/RecreationEducation/FirePreventionAssistance/Pages/Home.aspx>

State of Washington Department of Natural Resources fire prevention curriculum prepared for grades K-3.

Wildland Fire Prevention and Education Materials

http://www.nifc.gov/prevention_education.html

Federal wildland fire prevention and education materials available by mail order.

FEMA Parent / Teacher Lounge

<http://www.usfa.fema.gov/kids/l.htm>

Includes Lesson Plans, discussion points, resources, and is geared for Pre-K through grade 3. The quiz is one of the stops on the Wildfires Field Trip.

Wildland Fire Prevention/Education Teams

<http://www.nifc.gov/preved/>

Workshops

Project Learning Tree (PLT)

After attending a PLT workshop, you will receive the PLT Activity Guide that has many forest activities that have been used by thousands of teachers. These activities have been revised based on the comments from these teachers. To sign up for these classes contact:

State of Alaska, Dept of Natural Resources Forestry- Central Office

3601 C Street, Suite # 1034, Anchorage, Ak.99503

Phone (907) 269-8481

Project Wild

After attending a Project Wild workshop, you will receive the Project Wild K-12 Activity Guide and Aquatic Education Activity Guide that has many environmental education activities that have been used by thousands of teachers. These activities have been revised, and reprinted in new additions, based on the comments from these teachers.

To sign up for these classes contact:

Project Wild Coordinator, Alaska Dept. of Fish and Game, Division of Wildlife Conservation, 333 Raspberry Rd., Anchorage, Ak.99518

Phone (907) 267-2168

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