

# Human Uses and Impacts in Forest Ecosystems

Earlier sections focused on the interrelationships of the nonliving environment, the forest plants, and the forest wildlife (from microscopic organisms to moose). This section introduces the human component in the forest web of life and examines how we use and impact forests.

Elements of Life  
Long Tradition of Use  
Shrinking Forests  
Managing Our Forest Needs  
State & National Forests  
Forest Constituents  
Long-Term Consequences  
Wood in Our Lives  
Tongass Land Use  
How Much Paper Do We Use?  
Plant a Tree  
Forest Organizations, Careers

## Elements of Life

**Everyday, for bodily survival, we use air and water contributed by forests.**

### OXYGEN AND RAIN

We breathe the **oxygen** produced by trees and other forest plants during **photosynthesis**. In turn, forests use the **carbon dioxide** that all animals exhale as waste.

**Natural Resuscitation.** An acre of forest plants restores two to three times more oxygen per day than an acre of meadow or tundra plants. Each of us uses about 360 liters of oxygen daily – one day’s production from one tree.

**Moisture for Future Rain, Snow.** Forests also maintain the global **water cycle** by returning the rain they use to the atmosphere. In a process called **transpiration**, a single tree may pump 80 gallons of water **vapor** into the air on a hot day. Next time you are in a forest, notice how the humidity level is higher than in an adjacent non-forested area.

(For more information and a handy fact sheet, see INSIGHTS, Section 1, Elements: “The Giving Forests.”)

## WATERSHED GUARDIAN

Forests slow and even stop **erosion**. Tree and plant roots secure the soil while leafy branches minimize the impact of even the hardest rain or heaviest snow. Have you ever taken shelter from a downpour by going into a forest?

**Good Drinking Water.** The streams that start in or run through forests are clear and cool and have a more constant flow. The water table is recharged as forests protect **watersheds**.

**Ensuring Fishing Opportunities.** Both freshwater and **anadromous** fish use forest streams and lakes for spawning. Their young find the ideal combinations of food and shelter in those waters. Their survival – and our fishing opportunities – depend on the maintenance of those streams.

(See INSIGHTS, Sections 2 and 4, for other examples of wildlife that depend on forests.)

## Long Tradition of Use

Forest resources have been used since prehistoric times, as they are today.



- We continue to harvest fish, wildlife, and plants from the forest ecosystem.
- We harvest the trees themselves for a full spectrum of our needs from tools and building materials to traditional items for art and ritual.
- We use forests for seasonal recreation and daily scenic and mental enjoyment.

## NATIVE ROOTS

Forests are part of the heritage, mythology, and customs of Native Alaskans. Some Native cultures arose from the forests.

**Even “Traveling Trees” Important.** Cultures from non-forested areas traded for goods and materials from forest-based cultures or migrated seasonally to take advantage of the forests plants, wildlife, and shelter. Even those who always lived on the coastal tundra counted on “traveling forests” – driftwood – to provide materials for living.

**Artisans in Wood.** Alaska Natives continue their distinctive use of wood in Aleut visors, Tlingit and Haida totems and canoes, Yup’ik driftwood masks, Athabaskan birch-bark baskets, and Inupiat harpoon shafts and drum rims.

**Filling Utilitarian Needs.** Fish drying racks and other useful objects at summer fish camps are typically made from nearby wood. Driftwood remains an important energy source.

## HISTORIC MILESTONES

Forest resources contributed to many of Alaska’s historic milestones. Forests fed the growing number of newcomers and kept them from freezing. The first ocean sailing ship built on the west coast of North America used timber from the Russian-American Company shipyard in Resurrection Bay near Seward.

**Gold Rush Partner.** In Alaska’s series of gold rushes, wooden sluices and rocker boxes caught the golden treasure.

Alaska’s Copper River Delta in the Chugach National Forest has a unique management directive. Unlike most USDA Forest Service lands where multiple use prevails, the Delta is managed primarily for the conservation of fish and wildlife resources and their habitats.

Miners built their cabins and the towns that sprang up in their wake from the surrounding forests. Local sawmills kept busy.

**Snowshoes and Steamboats.** Trees, at a rate of two cords an hour, fueled the boilers of steamboats that carried passengers and cargo along the Yukon and all the other major rivers. Timber hewn into ties literally supported the railroads over the White Pass, to the Kennecott copper mines, and between Seward and the Interior. Snowshoes, sleds, and the beds of early roads all came from the forest.

**Where We Are Today.** It is hard to imagine where Alaska would be today if not for its forest resources.

## TANGIBLE, INTANGIBLE RESOURCES

Every year more log homes, firewood, and other utility wood products come from our local and regional forests. Some fine woods have been turned into musical instruments and works of art.

**Timber Industry.** Alaska’s large-scale timber industry has exported logs, pulp, and wood chips on the international market. The pulp has been used for paper, rayon, cellophane, and food fiber. Smaller scale businesses cut and prepare logs for the local market.

**Forests for People.** People purposely seek Alaskan forests for a variety of reasons. They carry on subsistence traditions, watch birds, fish, hunt, study nature, gather mushrooms and plants, hike, trap, photograph nature, and picnic.

**World Looks to Alaska’s Forests.** As wild areas around the world become more scarce and people are crowded into cities, many people throughout the world are placing a higher value on forests. Some consider Alaska’s forests particularly valuable because, for the most part, they have not yet been significantly changed by human activities.



## Shrinking Forests

The world's population today is expanding by 92 million people each year. Globally, we surpassed six billion in 1999. With the exploding population comes an increasing demand for forest goods, land, and the mineral resources that lie underground.

**Forests Fall to Other Land Uses.** Once covering two-thirds of our earth's land area, forests now cover less than one-third. About 80 acres of forests are cleared *each minute* in the world to develop farmlands, raise cattle and sheep, and make space for housing, communities, roads, reservoirs, and industries.

*The dilemma today and challenge for the future is how to meet increasing human needs while protecting environmental quality.*

## Managing Our Forest Needs

If forests are to remain healthy for the children of the future, then human uses of forests must be consciously weighed and managed. **Forest managers** study forest ecosystems, consider the sometimes conflicting demands, and recommend how to balance human use with forest health.

**Career Opportunities.** Forest managers and others in forestry-related careers can be found in a variety of employment situations including industry, government agencies, Native corporations, universities, and conservation organizations. (See following "Forest Organizations and Careers" fact sheet.)

**We Have a Role.** Individual landowners can be small-scale forest managers if trees already grow on their land or if they plant trees. (See following "Plant a Tree" fact sheet.)

**The "Public" of Public Lands.** And all of us have a role in state and national forest management because we are the "public" of public lands.

## ALASKA'S OFFICIAL FOREST LAND

Here is a quick summary of Alaska's forests.

**Total area of State:** 365millionacres

**Forested land** 120millionacres

**Coastal forest** 14millionacres

**Boreal forest** 106 million acres

Public agencies, native corporations, and various private owners manage Alaska's forest land. Only four areas are specifically set aside as "forests."

**Haines State Forest** 247,000 acres

**Tanana Valley State Forest** 1.8 million acres

**Tongass National Forest** 16.9 million acres

**Chugach National Forest** 5.9 million acres

**And even those areas are not 100% forest.** The Tongass, for example, includes 6.9 million acres of non-forested land: tundra, glaciers, rocks, and water. (See following chart for details.)

## TWO STATE FORESTS

Alaska's two state forests represent about 2% of state-owned land. They were designated in 1982 (Haines) and 1983 (Tanana Valley) to perpetuate "personal, commercial, and other beneficial uses of resources through **multiple use** management."

**Sustained Yield of Many Resources.** The Alaska Department of Natural Resources manages the state forests for sustained yield of many resources: fish and wildlife habitat, clean water, opportunities for recreation and tourism, mining, and timber harvest.

**Agency and Citizens Together.** For each state forest, the Department's Division of Forestry prepares an inventory and plan to guide management, including allowable cut for timber harvests. Citizens' advisory committees help to oversee management and revise the plans. The Haines State Forest coordinates its plan with that of the adjacent Alaska Chilkat Bald Eagle Preserve.

**Harvesting on Other State Land.** In addition to state forests, much of the other state-owned land is available for multiple use, including timber sales.



## TWO NATIONAL FORESTS

The USDA Forest Service manages much of Alaska's coastal rainforests and their productive old-growth forests (*defined as containing at least 8,000 board feet per acre of trees that are at least 150 years old*).

The Tongass National Forest in Southeast and Chugach National Forest in Southcentral are the two largest national forests in the United States.

**Reducing Wildfire Risk.** In the Chugach National Forest, few areas are harvested. Instead the timber is managed to reduce possible fuels for wild fires or other health risks.

**Tongass Harvest History.** Large scale logging on the Tongass began in the 1950s after the forest managers created two 50-year timber sale contracts. Pulp mills in Ketchikan and Sitka began operation, selling their product to Asian markets. In the 1990s those pulp mills closed.

**Diversifying for Local Businesses.** Foresters are designing many timber sales so they can be sold to small, local enterprises. The Southeast timber industry is diversifying to take advantage of markets for specialty wood products.

**Multiple Uses.** Fish and wildlife habitat, subsistence, watershed protection, mining, recreation, and wild spaces are some of the other multiple use demands met on Alaska's national forests.

**Duties As Assigned.** Foresters inventory and map the forests. They make sure forests regenerate naturally (90% do) or are replanted after harvesting or natural disturbance. Forest Service employees work in partnership with the state on forest health problems such as spruce bark beetle infestation. They also work with a team of agencies on fire fighting and prevention.


## ALASKA FOREST RESOURCES & PRACTICES ACT


The Alaska Forest Resources and Practices Act governs how timber harvesting, reforestation, and timber access occur on state, private, and municipal land. The Act protects fish habitat and water quality and ensures prompt reforestation. Forest management standards on federal land must meet or exceed these state standards.


1. Landowners must notify the state prior to timber operations.
2. The state establishes standards for forest management along water bodies, including buffers beside fish streams and prevention of erosion.
3. Reforestation is required except on land where the harvest is dead or dying trees.


## Forest Constituents – many voices


Just how forests should be used, conserved, and managed is defined differently by different groups:

 Logging company executives may describe forest management as the science of ensuring that the forest continually provides timber harvest opportunities.

 Hunters may say it is the science of making the forest suitable for the animals they harvest.

 Hikers might define forest management as the science of preserving forests in their most natural state.

 Landscape architects might consider it the art of shaping the forest to frame scenic vistas.

 Poets or philosophers may suggest that forest management is providing a sanctuary for the human spirit.

## Long-Term Consequences

Forest managers must consider many factors including forest health when deciding how competing resource demands can be met. Our northern climate makes their job even more challenging.

Alaska's forests require 200 to 600 years to reach climax or old-growth, the maximum stage in forest **succession** (*see INSIGHTS, Section 4*). Once logged, our forests need 200 to 300 years to return to old-growth. That means forest management decisions of today will affect future users not yet born.



## FOREST FACTS - WOOD IN OUR LIVES

Ever since earliest time, humans have used trees for shelter, weapons, heat, utensils, toys, transportation, building material, and art. Wood is valuable because it has so many uses and because it is an organic, **renewable resource**.

**Forests Shrink as Population Expands.** As our human population increases, our demand for wood and wood products grows. Are the forests expanding at the same rate as our population, or are they shrinking?

**Recycling to Conserve Forests.** People are searching for substitutes for wood to ease the

pressure on forests. Some wood products – paper and cardboard – can be **recycled**.

**Searching for Substitutes.** Plastics and other petroleum-based products can be used as some substitutes. Although petroleum is a non-renewable resource, the good news is that some plastics are recyclable – milk jugs, for example, can make indestructible boards for wet environments.

**How to Achieve Balance?** We need trees in forest ecosystems and for wood products. Our challenge is to achieve a balance.

## Alaska Trees – Wood Products

### BIRCH

Bowls	Flooring
Cabinets	Veneer
Matchsticks	Toothpicks
Tongue depressors	Golf tees
Dowels	Pulp
OSB ( <i>particle</i> ) Board	Firewood

### COTTONWOOD/POPLAR

Cabinets	Bridges
Pulp	Pallets
Old-fashioned fruit baskets	Veneer

### SPRUCE

Pulp	Lumber
Railroad ties ( <i>when treated</i> )	Bowls
Bridges ( <i>when treated</i> )	House logs
Musical instruments ( <i>Sitka spruce mostly</i> )	Airplanes
Scaffolding	Canoe paddles
Fish containers	Boats
	Firewood

### WESTERN HEMLOCK

Pulp	Veneer
Lumber	Railroad ties
Cabinets	Flooring
Furniture	Broom handles
Poles	

### ALASKA YELLOW CEDAR

House construction	Cabinets
Decking	Trail planks
Poles	Bridges
Boats	Furniture

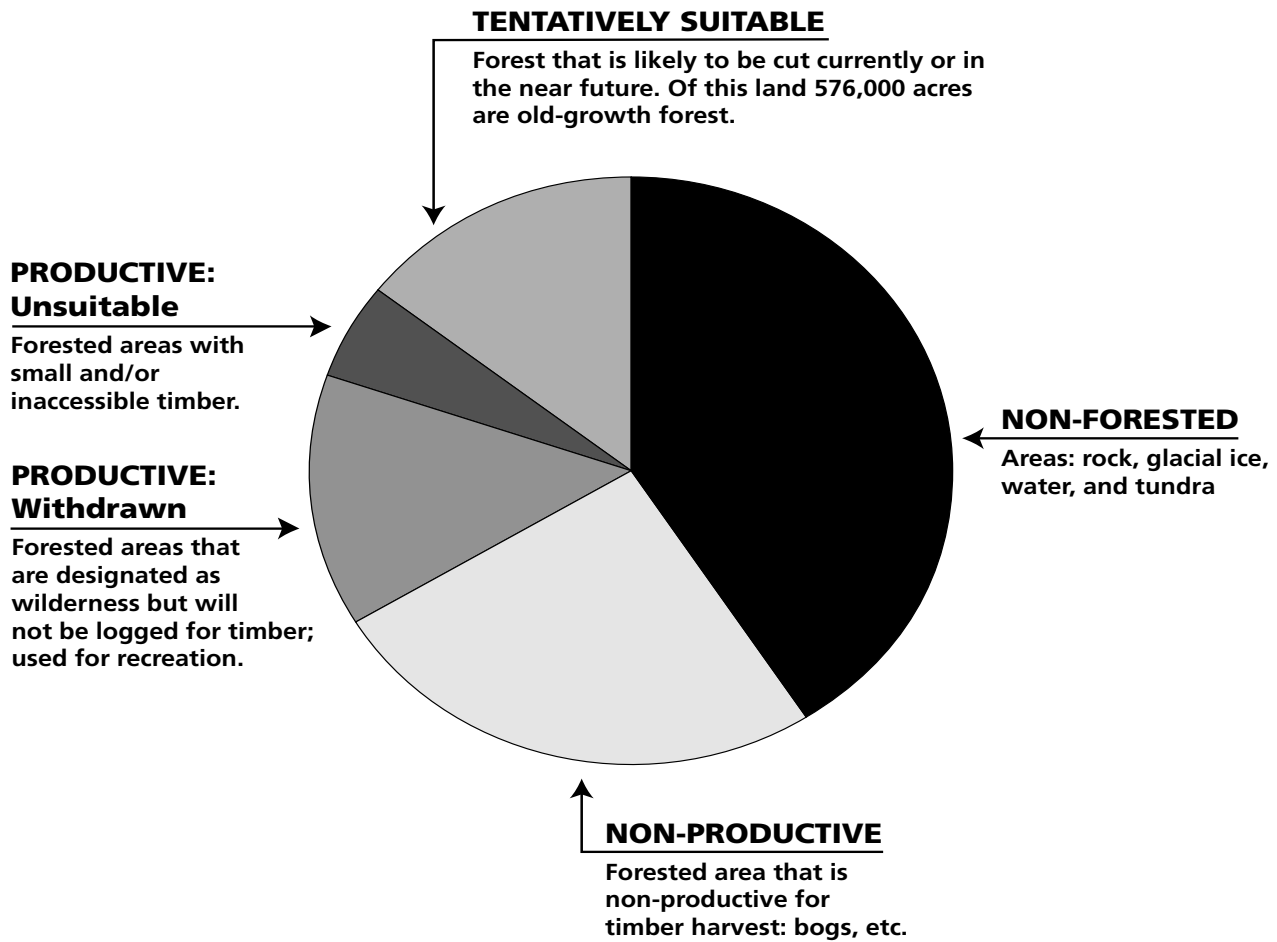
### WESTERN RED CEDAR

Chests	Canoes
Basket weaving	Shingles
Fence posts	
Lining for inside clothes closets	



# Tongass National Forest Is Huge!

*16.88 million acres of land in all.  
Here's how the Tongass breaks down, in terms of timber harvest.*



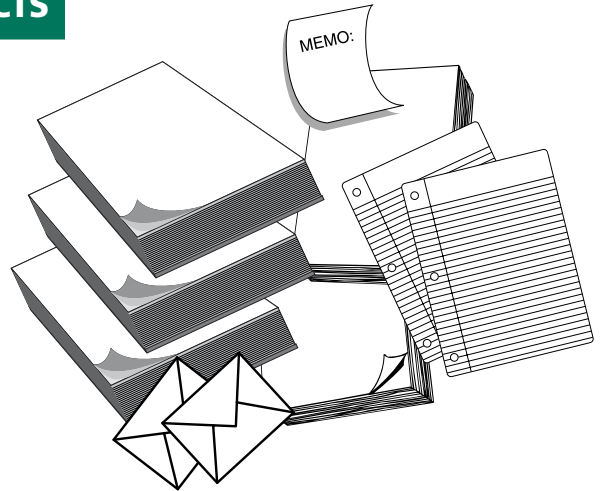
*\*Values are in million of acres*





**HOW MUCH PAPER DO WE USE?**

Americans use more paper than people in any other country, more than 50 million tons yearly. We use about 25 million tons of printing paper, 14 million tons of newsprint, 6 million tons of tissue products, and 5 million tons of packaging.



**Anchorage.** In 1997, the city of Anchorage collected 87,000 tons of wood and paper product waste of which only 9,800 tons was recycled. The remaining 77,200 ended up in landfills.

**Alaskans Toss More Than Others.** Americans throw away an average of 3.5 pounds of materials per person each day. Each Alaskan on average throws away even more – 6 pounds daily. More than half of the total waste is paper: cardboard makes up 7% of the total; newspaper, 14%; and other paper, 31%. Paper takes up as much as 50% of all our landfill space.

**Paper Recycling Savings.** If we recycled our newspapers, *each of us* would save about 4.6 average-sized trees yearly. Paper can be recycled about five times before the fibers weaken. When one ton of newsprint is recycled, •3 cubic meters of landfill space are saved, •13 to 17 trees are spared, •7,000 gallons of water are saved, and •380 gallons of oil are not used.

**Reduce, Reuse, Recycle.** We will save money and resources if we **reduce** our paper consumption, **reuse** what we do use several times, and then **recycle** it.

**Local Recycling Center.** The Anchorage Recycling Center collects recyclable materials from throughout Alaska. In 1997 the Center shipped 18,000 tons of recyclables (including paper) to




out-of-state markets. Groups are urging local industries to find ways to use our paper in recycled products.

**Local Industries Reuse.** Some paper is recycled here in Alaska. For example, Thermo-Kool Alaska buys about 2,500 tons yearly to use in insulation, animal bedding, and hydroseed mulch.

**Shipping to Outside Markets.** Most of the office grade paper (*which would include most of the paper used at school*) has to be shipped to Washington or Oregon. Other papers, like magazines and phone books, are sent to other countries of the Pacific Rim for recycling.

**Rural Alaska – Prevent Waste.** In rural Alaska, recyclers emphasize prevention of paper waste. Shipping costs are too high to find a market. RurAL CAP and the Alaska Intertribal Council are encouraging recycling in rural communities with help from AmeriCorps volunteers.

**Ways to avoid paper waste include the following.**

-  Shop consciously: buy the product that comes with the least amount of packaging.
-  Use the back side of writing paper and junk mail.
-  Think “reuse” by asking: now what can I make with this box to use it again?

# Arbor Day in Alaska



Arbor Day occurs on the third Monday in May. Students can join in planting trees and celebrating Arbor Day with the help of the following organizations:



Alaska Division of Forestry  
[www.dnr.state.ak.us/forestry/](http://www.dnr.state.ak.us/forestry/)  
The Urban and Community Forest Council  
550 W. 7th Avenue  
Anchorage, Alaska 99501  
(907) 269-8465  
*Offers tree planting grants to communities.  
Coordinates poster contest for 5th grade students.*

USDA Forest Service, Alaska Region  
[www.fs.fed.us/r10](http://www.fs.fed.us/r10)  
Public Affairs Office  
P.O. Box 21628  
Juneau, Alaska 99802-1628  
(907) 586-8806  
*Offers information about public and private support  
or tree planting.*

National Arbor Day organization  
[www.arborday.com](http://www.arborday.com)

Alaska Cooperative Extension Service  
[www.uaf.edu/coop-ext/](http://www.uaf.edu/coop-ext/)  
(various offices statewide)  
Main Office:  
Cooperative Extension Service  
2221 E. Northern Lights Blvd., Suite 118  
Anchorage, Alaska 99508  
(907) 279-6575  
*Offers information, brochures and activity suggestions  
for celebrating Arbor Day.*



**1. Keep roots moist at all times. Dry roots die.**



**2. Dig a hole large enough to spread the roots apart. Place the tree in the hole at the proper depth. Add loose soil.**



**3. Add more soil and firm with foot.**



**4. Gently mulch with wood chips.**



**5. Water regularly.**





## Forest-related Organizations and Careers

Forest science used to be relatively simple: Identify the most economically valuable tree species, assess the best timber harvest methods, and find ways to control insects.

Now forest science encompasses the forest ecosystem, fisheries and wildlife biology, soil conservation, medical research, recreation planning, and climate studies – just to name a few. We no longer manage and study forests by focusing on timber alone.

- A. *USDA Forest Service* (forest planning and management, wildlife biology, **silviculture**, hydrology, ecology, geology, forest recreation, fire management and control, plant **pathology**, **entomology**, international forestry aid, personnel, budgeting) <[www.fs.fed.us](http://www.fs.fed.us)> and <[www.fs.fed.us/r10](http://www.fs.fed.us/r10)> for Alaska.
- B. *Bureau of Land Management* (land-use planning, wildlife biology, ecology, plant pathology, entomology, personnel, fire management and control) <[www.blm.gov](http://www.blm.gov)> and <[www.ak.blm.gov](http://www.ak.blm.gov)> for Alaska.
- C. *National Park Service* (park planning and management, wildlife biology, fire management, law enforcement, recreation, education) <[www.nps.gov](http://www.nps.gov)>
- D. *Alaska Department of Natural Resources* (land-use planning, forest management, fire management and control) <[www.dnr.state.ak.us/forestry](http://www.dnr.state.ak.us/forestry)>
- E. *Alaska Department of Fish and Game* (research and management of forest wildlife) <[www.state.ak.us/adfg](http://www.state.ak.us/adfg)>
- F. *Native groups* (forest management, land-use planning, environmental education, forest or natural resource law, **lobbying**) Contact the Alaska Native Knowledge Network's regional coordinators <[www.ankn.uaf.edu](http://www.ankn.uaf.edu)>
- G. *U.S. Geological Survey* (study of forests as watersheds, research, soil science) <[www.usgs.gov](http://www.usgs.gov)>
- H. *University of Alaska* or other universities — (research and teaching in forest ecology and management, **horticulture**, plant pathology, entomology, land-use planning; Institute of Northern Forestry) <[www.uaf.edu/coop-ext/forestry/](http://www.uaf.edu/coop-ext/forestry/)>
- I. *USDA Forest Service Forest Products Laboratory* (wood products research, chemistry, laboratory technology, statistics, library, computer technology) <[www.fpl.fs.fed.us](http://www.fpl.fs.fed.us)>
- J. *The Alaska Forestry Association* (represents the forest products industry) <[www.akforest.org](http://www.akforest.org)>
- K. *Timber harvesting companies* (planning, budgeting, forest engineering, surveying, logging operations, truck driving, forest or natural resource law, lobbying) (*refer to Alaska Forestry Association for contacts at above web address*)
- L. *Lumber mill* (mill work, mechanical operations and maintenance, management, accounting, forest or natural resource law, lobbying) (*refer to Alaska Forestry Association for contacts at above web address*)
- M. *Lumber store* (sales, stock handling, transportation, managers, accountants)
- N. *Greenhouses and landscaping companies* (tree and shrub **horticulture**)
- O. *Conservation organizations* (These groups use people with careers in biology, ecology, forestry, lobbying, natural resource law, forest conservation, resource education, natural interpretation, marketing and fund-raising) Examples include:  
*Alaska Outdoor Council* and the *Alaska Fish and Wildlife Conservation Fund* <[www2.polarnet.com/users/outdoor/](http://www2.polarnet.com/users/outdoor/)>  
*Alaska Trappers Association*  
 <<http://paulbunyan.net/users/trappers/ata.html>>  
*National Audubon Society* <[www.audubon.org](http://www.audubon.org)>  
*National Wildlife Federation* <[www.nwf.org](http://www.nwf.org)>  
*The Nature Conservancy* [www.tnc.org](http://www.tnc.org)
- P. *Tourist guiding companies* (“ecotourism” guides may be knowledgeable about forests, forest recreation) *Alaska Wilderness Recreation and Tourism Association* <[www.alaska.net/~awrta](http://www.alaska.net/~awrta)>
- Q. *Occupational Handbook* <<http://stats.bls.gov/ocohome.htm>> describes all occupations.

