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ABSTRACT

These instructional materials were developed as a supplement to the "Alaska State Model Curriculum in Renewable Natural Resources/Agriculture." The topics covered focus on competencies from the curriculum for which materials were not readily available to Alaskan teachers and provide information that may not be sufficiently covered by existing curricula. Each unit begins with a teacher page that includes the competency and tasks from the curriculum. An overview, suggested learning activities, and resources for more information on each topic also are provided. The resources section suggests some materials available for each area. Topics covered include the following: opportunities in outdoor recreation; managing visitor services; second language visitors; using outdoor recreation equipment; working outdoors (backpacking, cross-country skiing, temporary camps); managing flora and fauna; observing wildlife; using first aid and survival skills; managing, maintaining, and protecting the resource; Alaska's park and recreation areas; understanding the importance of park and recreation areas; controversies related to parks and recreational land use in Alaska; employment in wildlife management; firearms; guiding hunters; construction and maintenance; working with wildlife; law enforcement; basic principles of biology; wildlife management; animal characteristics; and wildlife management issues. (KC)

Outdoor Recreation and Wildlife Management Resources

State of Alaska
Steve Cowper, Governor

Developed by the:
Alaska Department of Education
Office of Adult and Vocational Education

William G. Demmert, Commissioner

Karen Ryals, Administrator,
Office of Adult and Vocational Education

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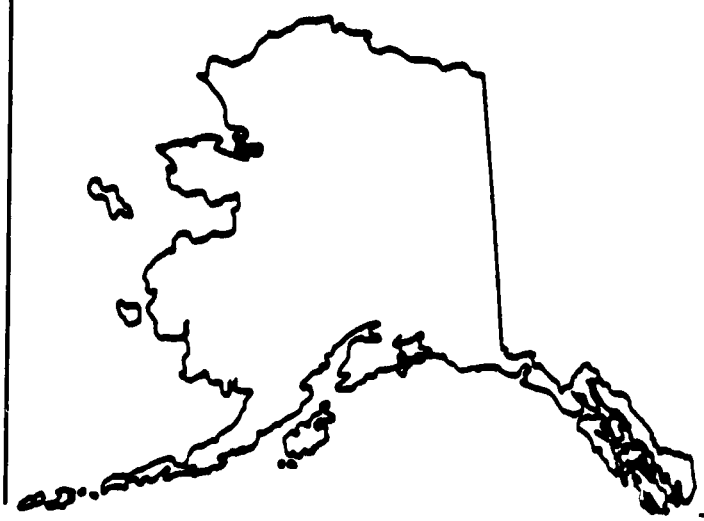

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Foreword

These instructional materials were developed as a supplement to the Alaska State Model Curriculum in Renewable Natural Resources/Agriculture. The topics covered focus on competencies from the curriculum for which materials were not readily available to Alaskan teachers, and provide information which may not be sufficiently covered by existing curricula. These instructional materials reordered some of the units, competencies, and tasks found in the curriculum. Compiling these materials allowed for more in-depth review of these fields which resulted in some combined units.

Each unit begins with a teacher page which includes the competency and tasks from the Curriculum. An overview, suggested learning activities, and resources for more information on each topic are also provided. The Resources section suggests some materials available for each area. Teachers and students should also contact their local and state libraries, and government agencies which often have resource libraries from which a wealth of materials can be obtained. A number of Cooperative Extension publications are referred to in this publication. Some of these publications may have been revised to meet current conditions or deleted if the materials are no longer appropriate. The inventories of some other publications are low, and may or may not be reprinted when the supply is exhausted.

This document should not be considered comprehensive. Many activities refer to "Project Wild," a heralded program created by a consortium of western states. This project is available to Alaskan teachers through the Project Wild Coordinator, Alaska Department of Fish and Game. *In order to obtain the materials, teachers must go through the Project Wild orientation class.* Contact the Project Wild Coordinator at the Alaska Department of Fish and Game, Box 2-3000, Juneau, AK 99811, or call (907) 465-4190 for details.

It is hoped that these materials will offer ideas to vocational instructors and information to students for vocational natural resource courses in Alaska. It should be noted that a number of the competencies and tasks covered in these materials have an accompanying risk. Instructors should contact sources such as Cooperative Extension Office, the U.S. Coast Guard Auxiliary, or Fish and Wildlife Protection before undertaking any of these inherently hazardous tasks.

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Finally, **Verdell Jackson**, Curriculum Specialist for the Office of Adult and Vocational Education, must be recognized for supervising the development of this publication and ensuring that it provides Alaskan students and instructors with instructional materials of the highest quality.

Karen Ryals
Administrator
Office of Adult and Vocational Education
Alaska Department of Education
January 1989

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Instructional Materials for Outdoor Recreation

Work with the Resource

Opportunities in Outdoor Recreation
Teacher Page

Competency: Understand employment and educational opportunities in parks and outdoor recreation

Tasks:

Identify requirements for jobs in parks and outdoor recreation
Identify educational and occupational opportunities
Locate resources for finding employment
Confer with prospective employers
Identify the work of:

a. backpacking guide
b. bus driver in or near parks and recreation areas
c. bus mechanic for buses in or near parks and recreation areas
d. bus tour maintenance worker
e. charter boat operator
f. clerk in parks and recreation visitor shops
g. clerk selling camping and hiking equipment
h. hotel worker in or near parks and recreation areas
i. mountain climbing guide
j. naturalist
k. outfitter
l. outfitter assistant
m. park aide
n. park maintenance worker
o. park ranger
p. park technician
q. recreation aid
r. restaurant worker in or near parks and recreation areas
s. ski lift operator
t. ski patrol person
u. tour bus driver
v. tourist guide for Alaska State Parks
w. tourist guide for city and local parks
x. tourist guide for private tour companies
y. tourist guide for state and federal historic sites
z. tourist guide for the National Park Service
aa. tourist guide in parks and recreation areas

Plan and implement SOEP, Coop or OJT

Introduction

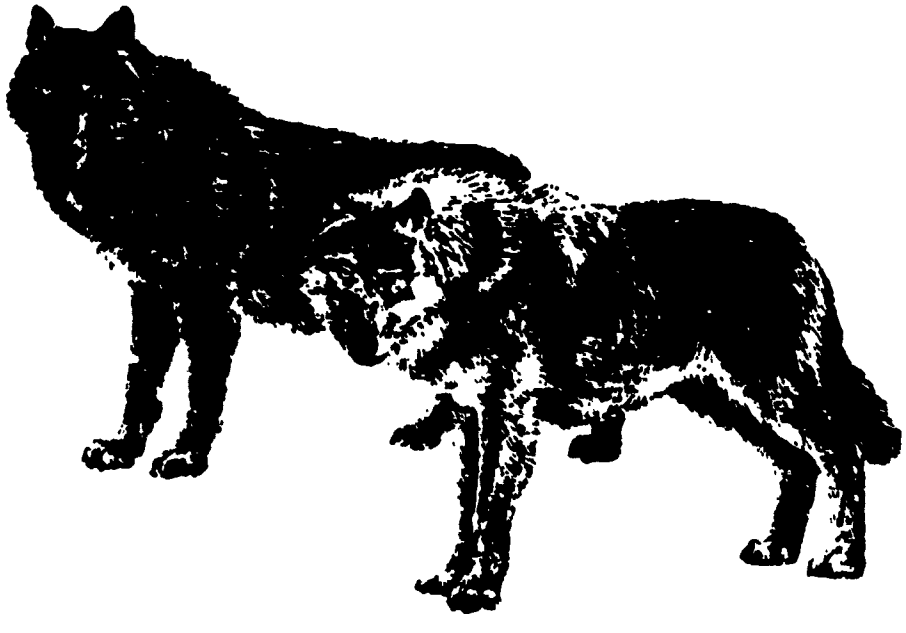
Alaska has a bold future in outdoor recreation because of an abundance of undeveloped space, an increasingly scarce commodity in other states. With the Alaska National Interest Lands Conservation Act (ANILCA) legislation and the establishment of new National Forest, National Park, and U.S. Fish and Wildlife Service Areas, Alaska more than doubled the area of designated public recreation lands in the U.S.A. The state has a high profile in the business of outdoor recreation. In a state the size of Alaska, there is no limit to the potential in this field. Outdoor recreation draws tourists who bring money to the state. Tourism is a non-polluting big-money industry. Tourism is a potential source of income for many Alaskans.

Overview

Employment potential varies in this field. While the state has great potential in the area of outdoor recreation, many of the areas prime for visitation are in remote sites. The employment is often seasonal, with very few jobs during the cold winter. But the visitor industry, directly associated with Alaska's outdoor recreation, already is a major employer. In 1985 19,000 people worked directly in full-time, year-round jobs in the visitor industry. In the same year, 38,000 people were indirectly associated with that industry.

Suggested Learning Activities

1. Brainstorm positions available in the field of parks and recreation.
2. Invite personnel officers from private, state and federal agencies related to outdoor recreation to class and interview regarding opportunities in the field/prerequisite training and skills; experiences in the field.
3. Discuss what makes a resume look good - develop a checklist of requirements for a winning resume.
4. Fill out applications and prepare resumes for positions in the field of parks and recreation. Evaluate with partner using checklist.
5. Discuss what makes a good interview .
6. Conduct practice interviews with partners. Evaluate with partner using checklist.



Courtesy of Alaska Department of Fish & Game, Wildlife Notebook Series

Resources

Alaska Natural Resource and Outdoor Education Association (ANROE), P.O. Box 110536, Anchorage, AK 99511-00536. *Association of educators interested in and promoting natural history education.*

Alaska Natural History Association (ANHA), c/o National Park Service, 2525 Gambell St., Anchorage, AK 99503. *Publishes books and distributes information on a variety of natural history, parks and recreation topics. Write for information. Their publications are available at Alaska Public Lands Information Centers in Anchorage, Fairbanks, Tok, and (soon to be) Ketchikan.*

Alaska Outdoor Council, 3417 Katlian, Eagle River, AK 99801.

Alaska State Division of Tourism, P.O. Box E-101, Juneau, AK 99811

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P O. Box 107001, Anchorage, AK 99510-7001

American Hiking Society, 1015 31st St., N.W., Washington, DC 20007. (703) 385-3252. *Their directory "Helping Out in the Outdoors" is a directory of volunteer jobs and internships in parks and forests nationwide. Two-year four issue subscription, $12. Single copy $3 plus $2 per single copy postage.*

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513. *Currently expanding their Resource Apprenticeship Program (RAPS). Contact their office for details.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503. *Has a local hire program for jobs throughout the state.*

The Student Conservation Association, P.O. Box 550, Charlestown, NH 03603 (603) 826-5206. *This agency manages volunteers in national parks, forests, refuges, on BLM lands, in state park and wildlife agencies, and private natural resource agencies.*

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, Ketchikan Area, Federal Building, Ketchikan, AK 99901, Stikine Area, P.O. Box 309, Petersburg, AK 99833, Chatham Area, 204 Siginaka Way, Sitka, AK 99835. *Actively seeks qualified local employees. Forestry Sciences Library in Juneau holds extensive references on recreation topics.*

Books

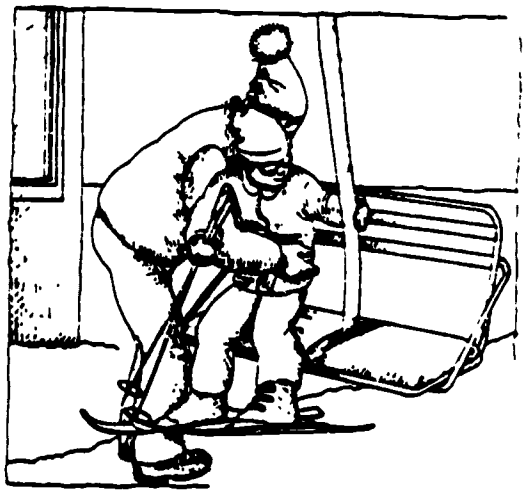
Boy Scouts of America, Direct Mail Division, P.O. Box 909 Pineville, NC 28134-0909. *The Merit Badge Library offers publications specific to many areas related to wildlife. Sample topics include Backpacking, Camping, Canoeing, Environmental Science, Hiking, Fish and Wildlife Management, General Science, Insect Study, Nature, Orienteering, Photography, Plant Science, Public Speaking, Rifle and Shotgun Shooting, and Surveying. Write for complete list. Booklets $1.25 each. Also, the Fieldbook is an excellent resource.*

Opportunities in Outdoor Recreation

What are some employment and educational opportunities in parks and outdoor recreation?

You ought to look around in your own back yard. Employment is on the increase in outdoor recreation in Alaska. Openings for the federal government, in fact, give preference for local hire. You might have a better chance of getting a job than someone from Outside. The job may not pay a lot to start off, but it could have a great future.

Other jobs exist out of the realm of government. You could work in a private campground, taking people on hikes, or you could work in any of a multitude of other businesses serving Alaskan visitors. Those who work in the outdoor recreation field need, like in so many fields, a strong background in basic skills. No matter what you think, you'll need to write, you'll need basic office skills, and you'll need to do some math. You'll need to fill out forms, and you'll need to weave your way through government bureaucracy. Leadership skills, like those acquired in a vocational student leadership organization like the *Future Farmers of America (FFA),, Scouting, 4-H* or other such organizations can help. Leadership skills are integral in the outdoor recreation field.



What does it take to get a job in parks and outdoor recreation?

Skills requirements vary. Like so many things in life, if you start out early and focus on what you want to do, you can pick up the skills and experience you need for the job you want. You may already have learned a number of skills that will help you to find a job. The National Park Service seasonal job application asks you to describe your skills and experience related to outdoor work. The Park Service lists the following skills as important for work in national parks:

Interagency fire job qualification (Red Card)
Use of common fire tools
Use of chainsaw
Wildland Fire Suppression
Fire protection inspection experience

Helitak experience
Initial attack
Engine crew
Fire hydraulics
Prescribed burning
Firearms maintenance and use
Non-motorized water craft
Powerboat experience
Ability to identify and correct minor motor vehicle/boat malfunctions (change tires, replace fan belt, jump-start, replace propeller, etc.)
Ability to operate equipment such as farm equipment, heavy duty vehicles, off-road four-wheel drive vehicles, etc.
Technical rock climbing
Experience with technical equipment (i.e. telephone, switchboard, computer terminal, radio dispatcher)
Standard First Aid
Advanced First Aid
CPR
EMT
First aid experience
Experience in search and rescue
Experience in vehicle traffic control
Cross-country skiing
Downhill skiing
Outdoor experience/training (i.e. backpacking, hiking, camping)
Public speaking ability
Handling human relations under stress (i.e. complaint desk, handling of mentally impaired/emotionally disturbed persons, violator contacts, etc.)
Wilderness survival experience/training (i.e. desert, mountain, tropical)
Bear management
Fire management
Vegetation management
Taxonomy (flora/fauna)
Plant or forest ecology
Mathematical and/or statistical ability
Environmental education experience
Archaeological/Curatorial skills (i.e. preserving, collecting, documenting evidence)
Knowledge and/or experience in physical/biological sciences (astronomy, ornithology, geology, paleontology, marine biology, entomology, etc.)
Dramatic experience/training
Musical ability
Creative /technical writing ability
Tour guide experience (i.e. ability to prepare and conduct tours)
Working an information desk
Audio-visual equipment operations
Handling money on a job (sales, toll collection)
Photography
Artistic/graphic ability
Experience as a leader or counselor in a day, overnight, or formal recreational program or activity
Experience in working with inner-city urban recreation or therapeutic recreation programs
Care, handling of farm animals, riding of horses
Advanced Life Saving
Water Safety Instructor
Lifeguard experience
Historic military skills

Colonial/pioneer agricultural techniques or knowledge, i.e. gardening, cotton, tobacco, vegetables
Colonial pioneer homemaking techniques or knowledge, i.e. types of food prepared, open hearth and stove cooking, fiber or fabric arts
Cultural skills (Crafts/skills for living history and demonstration programs)
Native American Indian culture/knowledge
European American culture/knowledge
Black American culture/knowledge
Latin American culture/knowledge
Oriental American culture/knowledge
Other American cultures
Foreign language conversational ability in one or more of the following:
- *Spanish*
- *German*
- *French*
- *Italian*
- *Japanese*
- *Chinese*
- *Native American Indian*
- *Sign Language*

Those are the skills, nation-wide, which the National Park Service finds important for work in that field.

What are some educational and occupational opportunities in outdoor recreation?

The 1987 Alaska Career Guide lists the following jobs and opportunities in outdoor recreation:

Recreation Leaders: "Organize, teach and conduct recreational activities for adults and children in public recreation programs, playgrounds, camps, etc. Demonstrate equipment and techniques, explain rules, and supervise to enhance safety, enjoyment, and skill in such activities as arts and crafts, sports, music, dance, dramatics, and camping. Opportunity very good, 580 employed at a salary of $1,600-$2,100 monthly, vocational school or college training needed, suggested courses include advanced math, biology, oral and written communications, psychology, sociology, art, and physical education. Related occupations include recreation directors and supervisors, and recreation guides. Employers prefer persons with 2 to 4 years of college and experience as a recreation activity instructor. Expertise in an activity such as ski , painting, or tennis may help get part-time and seasonal positions. Where the activity is physical, employers may require CPR and first-aid training.

Recreation Guides: "Organize and conduct hunting, fishing, hiking, float, or similar trips for adventurers and tourists in scenic and wilderness areas. Demonstrate equipment and techniques. Explain rules and regulations. Observe clients to ensure their safety. Opportunity limited. Suggested training is on-the-job. Background courses helpful include basic math, physical science, biology, oral communications, psychology, home economics, physical education, and general shop/mechanics. Related occupations include recreation directors and supervisors, recreation leaders, and tour guides. The majority begin as helpers (packers, swampers, etc.) and advance with on-the-job experience. Need a general knowledge of the outdoors and specific skills relative to the type of outfitting or guiding service provided. Hunting and fishing guides must be licensed.

Tour Guides: "Conduct visitors through museums, historic sites, parks, and other places of interest while providing commentary. Give tours of glaciers, tundra, seafood canneries, pulp mills, and mines. Visit villages, towns, and cities. Most operate a car, van or bus while describing points of interest. Opportunity limited, 130 employed at a salary of $1,200-$2,000 monthly. Vocational training is suggested with courses in basic math, physical science, oral communications, psychology, sociology, and auto mechanics. Related occupations include bus and taxi drivers, park rangers, and recreation guides. Employers prefer neat, polite, articulate, and enthusiastic tour guides. May have to be 21 or 25 and have a good driving record for positions that require driving. Some employers require at least 2 years of college. Prior work experience meeting and assisting the public is useful."

Where can I find jobs in outdoor work?

You can try the federal, state and local governments. You can find jobs in camps, in private campgrounds, with city park departments, on cruise ships. You can ask the counselor at school about such jobs or apply directly to employers. You can look in the newspapers, or ask at job service. Youth Employment Services may help you as might state and federal personnel offices. The filing period for seasonal employment with the federal government is December 1 to January 15. You can try personnel offices at city and municipal governments. Many outdoor recreation agencies employ volunteers. Others, like the BLM, have intern programs. Another way to find a job is to build your skills through volunteer work. Volunteering can give you valuable work experience and may lead to a paying job later. (It often does.) It's a great way to get your foot in the door.

Look in the newspaper every day. A recent issue of an Alaskan newspaper listed the following jobs:

aircraft dispatcher
aircraft mechanics
bartenders
boat guide
bus maintenance & wash crew
canoe guides
chef-preparer
chefs—railroad
cleaners
cleaning positions
dishwashers
driver/guide
drives
entertainers
float plane pilots
German travel assistant
guide/entertainers
host guides
hostesses/cashiers
hotel workers
housekeepers
maintenance personnel
oars persons on rafts
car managers
ramp hands-loaders
recreation director
reservation-takers
retail sales clerks
shuttle drivers
stockers
ticket agent
tour coordinators
tour guide/gift shop position
tour hosts-drivers/escorts
travel/tourism instructor
visitor information aide
visitor information specialists
wagon master (RV escort)
wait persons
wilderness guides
Zodiak operators

So, do I need to go and talk with employers?

You apply for such jobs in much the same way you would any other job. Sometimes it helps to know someone, and other times you might just get lucky. The best way, though, to get a job is acquire the qualifications needed for that job. Once you have those qualifications, you look for the job(s) you have targeted. To find jobs in this field or others, look in the newspapers, in magazines, follow up your leads, and ask people. You also might send out letters of inquiry to the types of places in which you would like to work. Prepare a resume before you visit the employers. Though most employers have an application form, a resume will allow you to take your time, in a neat fashion, to highlight your skills and experience. A resume can be photocopied, so that you can avoid filling out endless forms. Many employers will accept the resume in lieu of filling out the application. Assistance in resume writing is available from high school, college, and Job Service career counselors.

Remember to look neat when you go to talk to employers. Look at it from their point of view. They might not have the time or energy to talk to someone who looks slovenly. If you don't have nice clothes, borrow some. Stand up straight, face the person you're talking to, and be on your best behavior. If that business doesn't hire you, try another.

What are some jobs in outdoor recreation?

There are all kinds of jobs in outdoor recreation. Alaska is the land of the great outdoors, and jobs related to outdoor recreation are expanding. They include:

a. *backpacking guide*
b. *bus driver in or near parks and recreation areas*
c. *bus mechanic for buses in or near parks and recreation areas*
d. *bus tour maintenance worker*
e. *charter boat operator*
f. *clerk in parks and recreation visitor shops*
g. *clerk selling camping and hiking equipment*
h. *forest interpreter for U.S. Forest Service*
i. *hotel worker in or near parks and recreation areas*
j. *mountain climbing guide*
k. *naturalist*
l. *outfitter*
m. *outfitter assistant*
n. *park aide*
o. *park maintenance worker*
p. *park ranger*
q. *park technician*
r. *recreation aid*
s. *restaurant worker in or near parks and recreation areas*
t. *ski lift operator*
u. *ski patrol person*
v. *tour bus driver*
w. *tourist guide for Alaska State Parks*
x. *tourist guide for city and local parks*
y *tourist guide for private tour companies*
x. *tourist guide for state and federal historic sites*
y. *tourist guide for the National Park Service*
z. *tourist guide in parks and recreation areas*

What about my Supervised Occupational Experience Program, Cooperative Work Experience or On-the-Job Training?

If you're a member of a student leadership organization such as *VICA, DECA, FFA,* or *HERO,* consider a project in outdoor recreation. Such a project will introduce you to the varied employment potential of the field. Additionally, consider an outdoor recreation work site for your cooperative work experience or on-the-job training. You may be on the forefront of employment in a new and growing area, not to mention one that's really fun.

Use the Resource

Managing Visitor Services
Teacher Page

Competency: **Manage visitor services**

Tasks:
Greet the visitor
Inform visitors of regulations
Register visitors
Schedule events and programs
Schedule facilities use
Give instructions and directions
Manage the flow of vehicular or pedestrian traffic
Manage visitor requests and complaints
Manage youth groups and events
Take reservations
Develop and conduct a visitors program and tour
Prepare and give a naturalist slide show

Introduction

Employers in the field of visitor services cannot emphasize too much the importance of managing visitor services. Many times work in the field of outdoor recreation involves basic crowd management or group presentation skills.

Overview

Alaska's visitor industry is galloping. With a good share of all the recreational lands in the United States, the state is rapidly becoming a major national and international tourist destination. Yet, because many recreational settings in the state are difficult to get to, because of the distance from population centers and the short summer season, the visitor potential has barely been tapped. Because Alaska offers such a wide variety of recreational settings, more and more jobs will become available as access to these areas becomes more economical. Alaska is becoming a well-known tourist destination.

Suggested Learning Activities

1. Tour a visitor center and ask the person in charge of managing visitor services to talk with you about how to: greet and register visitors and make reservations; inform visitors of regulations, directions; conduct programs and tours; manage traffic flow, visitor requests/complaints, youth groups, and events; and give naturalist slide shows. Ask for copies of appropriate forms required for the above functions.
2. Role play/practice visitor services skills with partners. Use copies of forms for registering visitors, taking reservations and complaints, schedule events. Discuss/evaluate the completed forms.
3. Ask the visitor guide or naturalist at a local visitor center to give you a sample tour/program and slideshow. Develop checklists: requirements for a good program and requirements for a good slideshow.
4. In small groups: select a special place where you might take visitors. Write up a script that you would use to conduct a program and tour of your special place. Give your tour to other small groups. Ask them to evaluate your tour using the checklist.
5. Similarly, choose a theme related to outdoor recreation and prepare a slideshow with a small group of people. Plan your show carefully, using your checklist and the tips on page 13. Give your slide show and ask other groups to evaluate your show using the checklist!

Resources

Alaska Natural Resource and Outdoor Education Association (ANROE), P.O. Box 110536, Anchorage, AK 99511-00536. *Association of educators interested in and promoting natural history education.*

Alaska Natural History Association (ANHA), c/o National Park Service, 2525 Gambell St., Anchorage, AK 99503. *Publishes books and distributes information on a variety of natural history, parks and recreation topics. Write for information. Their publications are available at Alaska Public Lands Information Centers in Anchorage, Fairbanks, Tok, and (soon to be) Ketchikan.*

Alaska Outdoor Council, 3417 Katlian, Eagle River, AK 99801.

Alaska State Division of Tourism, P.O. Box E, Juneau, AK 99811

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

American Camping Association, Bradford Woods, 5000 State Road 67 North, Martinsville, IN 46151-7902 *Information on organized (group) camping.*

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Campground Owners Association, 804 D Street NE, Washington, DC 20002 *Association of private campground owners.*

National Interpreters Association, c/o Paul Frandsen, 3801 W. Government Way, Seattle, WA 98199.

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

Recreational Vehicle Industry Association, P.O. Box 204, Chantilly, VA 22021 *This group has information on private campgrounds and requirements of RV users.*

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, Ketchikan Area, Federal Building, Ketchikan, AK 99901, Stikine Area, P.O. Box 309, Petersburg, AK 99833, Chatham Area, 204 Siginaka Way, Sitka, AK 99835. *Actively seeks qualified local employees. Forestry Sciences Library in Juneau holds extensive references on recreation topics.*

Books:

Venture Publishing, Inc., 1640 Oxford Circle, State College, PA 16803, (814) 234-4561. *This publisher specializes in textbooks for recreation and parks and leisure studies. Of special consequence to this area is the Park Ranger Handbook by J.W. Shiner, 1986.*

Managing Visitor Services

What's a good way to greet the visitor?

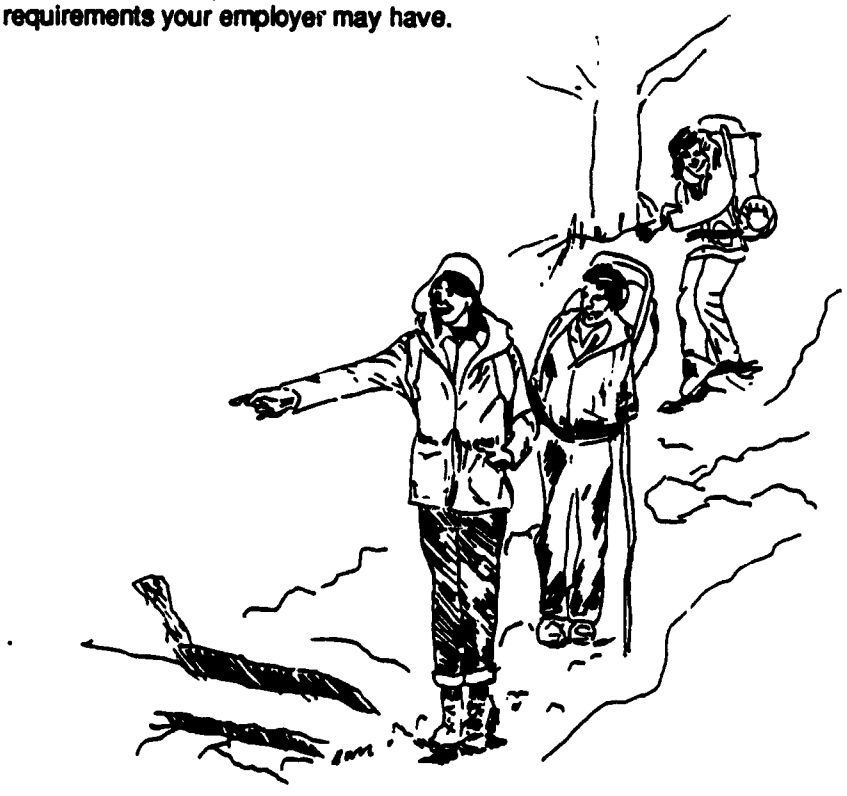
You greet the visitor like you would a customer in a business. You face the visitor, ask him/her questions about why they're visiting your area, and you show the visitor what is special about where you work. A friendly greeting, using "sir" or "ma'am" is best. Formal greetings are best. Visitors are out of their element. They may be tired, cold, wet and weary. The personal skills useful in any profession dealing with people will come in handy. A friendly handshake, a cordial tone in your voice, and informative directions will serve the visitor well.

Do I need to inform visitors of regulations?

Yes. People on vacation are not familiar with local customs, laws, or regulations. They might be a bit disoriented in a new environment and they need to know the rules. You've been informed of rules in your life. You need to treat visitors as you'd like to be treated.

Is there a trick to registering visitors?

Do it quickly and efficiently. Depending on whether you're taking reservations for a campground, for a boat tour, or reservations for dinner, you need to get complete information needed with little wasted time. The information you record depends on the requirements your employer may have.



How do I schedule events and programs?

Make sure you have your information, lay it out in columns, on a grid or on a computer spreadsheet, and put it all together. The difficult part comes when you need to reschedule events in order to fit everything in.

In outdoor recreation, you might be scheduling a program in knot-tying, fishing, a natural history hike, or a slide program. Parks, preserves, and other natural areas support hosts of varied programs.

How do I schedule facilities use?

Especially in Alaska you do it politely. Tourism is growing, and depending on what aspect of the visitor industry in which you're working, reservations might be tight. Watch the airline reservations clerks at the air ort. Working with tired, travel-worn people thousands of miles away from home is easily one of the hardest aspects of this job. Remember that facilities are typically booked long in advance for the prime visitor season. Make your requests for scheduling both by mail *and* phone.

How do I give instructions and directions?

Remind yourself time and time again that your visitors are newcomers to your area. They are guests. Give directions clearly and patiently. You can easily strike a nerve if you talk down to someone. There is a good chance that the visitors you deal with will know very little about the area they're visiting. You might be asked if you live in an igloo or if where you live is inhabited. You need to offer factual information without reacting to the occasional absurd question.

You need to be thoroughly familiar with the purpose for the recreation setting. Was it established for team sports or is it a park or refuge? You'll need to know the physical characteristics, resources, areas and facilities in the setting to be familiar with the programs available whether it's a film on Denali or goldpanning at a nearby mine. Know the policies of the recreation setting–do the visitors need to pay or not, can they pick the flowers, how to fish. You'll need to know the rules and regulations. Know situations such as road and trail conditions, whether campgrounds are full, and special conditions such as bear danger. As for the local area, familiarize yourself with the local transportation system–air taxis, buses, airports, and their current situations. Find out about the availability of services, including restaurants, service stations, auto and camper repair, hardware, department, drug and food stores, physicians, dentists, veterinarians, hospitals and clinics, banks, churches, and phones. Have a list of local cultural facilities such as museums, libraries, tourist attractions, and cultural centers, special program or recreation activity opportunities in nearby towns, and information about other recreation settings available for the visitor. Find a book which tells about origin of place names. Visitors have a special interest in such lore.

Have maps handy, not to mention tourist brochures from a range of attractions. You're not only benefiting the visitor, you're benefiting the local economy.

How do I manage the flow of vehicular or pedestrian traffic?

There aren't that many sites in Alaska which experience traffic jams, but many of the jobs in the visitor industry involve crowd control. Police officers are trained in traffic directing. They wear reflective clothing, white or reflective gloves, wield a flashlight, sometimes have a whistle, and always motion to drivers in an exaggerated, purposeful manner.

As for pedestrians, some stands, fence posts, and a little bit of rope go a long way. Sometime when you're visiting a major tourist destination, like Disney World, observe how they manage foot traffic. Permanent rails funnel visitors back and forth in orderly formation. Fans cool them as they shuffle in line.

Many of the visitors to Alaska arrive in *Winnebagos* or *RVs*. These large vehicles are either rented in-state, are brought on the Alaska Marine Highway, or are driven up the Alcan Highway. With some familiarity with those vehicles and their requirements, and other aspects of "car camping" you can better assist those visitors with their visit.

RVs require a place to park and a place to dump refuse. Many Alaskan communities are in the process of developing these facilities, hoping to attract more visitors. Despite the spectacular surroundings, the RV owner might be frustrated in finding RV accommodations they are accustomed to in the lower 48. Campers might be towing a hard-shell trailer. These hard-shell trailers might range in size from tiny aluminum trailers housing one bunk and a stove to enormous behemoths with living room and shower. Many of those with hard-shell trailers have the same requirements as those in RVs have.

Other car campers might be using a tent, a *pop-up camper*, or they may sleep in a van. Camping is such a common endeavor in the U.S. that nearly everyone has camped in some way or form.

Any special techniques on managing visitor requests and complaints?

Nobody is going to have a perfect vacation. There will be complaints. Depending on where you work, there will be some sort of way to record and forward a visitor complaint. Take it seriously, whether you feel the complaint is justified or not. Get as much information as you can, using the five Ws: *Who, What, When, Where, Why.* Tell the visitor that you will investigate the matter, then do. If you work for the federal or state governments, there are always formal means by which the visitor may file their complaints, suggestions and requests.

As J.W. Shiner explains in The Park Ranger Handbook, "Ascertain the facts surrounding the situation or problem leading to the complaint. Listen attentively as the visitor tells the story in his/her own words. If the complaint is of a serious nature or one that cannot be rectified "on-the-spot", the facts should be obtained in writing on the approved form. Double check the facts of the written complaint with the visitor to assure accuracy and completeness. An attitude of interest in the complaint and a genuine appreciation of the visitor's time and effort should pervade the conversation.

"Convince the visitor the complaint will be taken seriously and action will be taken to rectify its cause. It is not necessary to defend your employer at this time. If you are authorized to rectify the complaint on the spot, or if you can do so at a later time, take action to do so." You may take the problem to your supervisor. Go to your supervisor with the person complaining. Not only will it show that you are interested in the complaint, but you can assure that the whole story is told, not only one side.

If the problem can't be settled there, you should inform the visitor, as soon as possible, of what will done to address his/her complaint. You can do that in person or in writing. A letter informing the visitor of the action taken along with a thank you for bringing your attention to the matter will enhance the image of the recreation setting.

If the complaint is unreasonable, or if it is the result of a misunderstanding, attempt to explain the situation in the most courteous manner possible. But don't forget that what might be a small matter to you might be something big to the visitor. Don't discount their discomfort. Even if the complaint seems ridiculous, that visitor might not be the only visitor who feels that way.

Occasionally a visitor may be irate. J.W. Shiner discusses this situation also: "In the event the complaining visitor is overly irate, the exercise of tact and diplomacy is very important. Attempts should be made to calm the visitor before proceeding. Speaking to the visitor in a calm professional manner, asking him/her to sit down, offering a drink (water, coffee, *Coke)* and maintaining your composure will usually quiet the visitor sufficiently to learn the source of the complaint. The presence of several other employees will also, on occasions, tend to relieve some of the visitor's aggression. You should, however, remain alert to protect yourself should the visitor become physically violent. After calming the visitor, the standard complaint handling procedure should be followed.

"The chronic complainer presents another special problem. In essence, process complaints so received in the prescribed manner. Don't automatically dismiss a complaint merely because it came from a chronic complainer. "The person may be pointing out legitimate concerns." (Shiner, pp. 3-12-3-13)

How do I manage youth groups and events?

You can't treat kids like adults. Kids are different. When you manage youth groups, you'll need to make sure there are plenty of adults present. If you're doing all the arrangements, start with the kids' parents. They have an obligation to assist. For other chaperones, don't overlook co-workers. As a last resort, ask reliable friends who you know will do a good job.

Are there any other special tips to taking reservations?

Be polite. Nearly everyone has heard the adage "the customer is always right." In the visitor industry, the adage might be "the customer is always in a hurry and there's a good chance that he/she will snap at you." Be patient. And be precise and thorough when you take reservations. You'll need information such as number in party, length of travel or stay, the exact package or plan they wish to purchase, a contact phone, means of payment, and sometimes special information such as the age(s) of the visitor to qualify for special rates.

Remember that reservations are made for several reasons. First, an accurate reservations system assists in insuring maximum occupancy of the hotel, campground, or other facility. Second, a reservations system facilitates planning for both visitor and facility (the visitor can feel confident he/she has a place to stay and the facility can determine space available for other visitors. Third, an efficient reservations system helps the facility to maintain a good reputation. Fourth, reservations operations involve attention to details such as reservations for VIPs who will receive special attention and reservations made by a travel agent who receives a commission from the facility. An effective reservations system, which includes the accurate completion of many forms or includes careful use of a computer reservations system, serves both facility *and* visitor.

How should I develop and conduct a visitors' program and tour?

It takes a long time to prepare a good tour. Professional naturalists spend a lot of time getting ready. A good place to start is in the public library. Hopefully you're the kind of person who enjoys reading natural and human history. Those are the topics outdoor recreation visitors have the greatest interest in. The more you know about your area's natural and human history, the better naturalist or guide you'll be. People are interested in scientific facts and statistics, and a place as full of superlatives as Alaska is full of them. For example, Yukon Delta, the largest wildlife refuge in Alaska, is larger than the states of Rhode Island, Connecticut, Delaware, Hawaii, New Jersey, and Massachusetts combined. But visitors want more than that. They like human interest stories, the stories you might gain by reading historical accounts and the accounts of naturalists, guides, and weavers of yarns. Visitors also have an interest in the *personal* side of things. That's where your own experiences in the outdoor setting come in. A talk, program or tour can be based around an experience *you* had. Such a story will bring the impact of the outdoor experience home.

How do I prepare and give a naturalist slide show?

Giving a slide presentation is an art in itself. Too many inexperienced people offer slide presentations. No wonder sometimes people groan in the same way they would when someone at a party would announce "home movies!" A good slide presentation takes a lot of time to put together. Professional naturalists sometimes spend days and days preparing a show which takes only a half hour to give. And time is something to consider in itself. Your slide show should not go on forever. Hold each slide on the screen only about five seconds or so. A half-hour should be the maximum time. For special occasions, in special circumstances, you could go longer, but not much longer. People like pictures, but they don't like being held captive while someone drones on forever.

Consider blending music with your slides. Music which fits the mood of the photos is best. Scratched, over or underexposed, or poor photographs have no place in a public program. Practice your program several times before you give it. Upside-down, sideways, or backwards slides should be put in place *before* the slide projector is turned on in public.

Second Language
Teacher Page

Competency: **Speak a second language**

Tasks:
Use greetings in local Native language
Greet tourists in Japanese, French, and German
Identify cultural differences among parks and recreation area visitors
Consider cultural differences in providing visitor services

Introduction

Awareness is growing of the importance of the world economy. Foreign tourism is a bright spot in the Alaskan economy. No longer can American hosts simply expect the foreign visitor to know English. Those successful in the visitor industry assist the visitor in whatever way needed. Alaska is just seven hours from Tokyo by air. While only 5,000 Asian tourists, mostly Japanese, came to Alaska in 1987, that figure might double in 1988. Those in the tourist industry need to prepare for this influx in foreign tourism.

Overview

Many employers in restaurants, lodges, hotels, or elsewhere in the visitor industry seek employees with at least a cursory knowledge of the languages the visitors will be speaking. Some familiarization with Spanish, French, Italian, German, Japanese, or Chinese can help in getting a job for the National Park Service. While skill in the foreign language in and of itself might not be the major factor as to whether someone gets a job, it is a major contributing factor. As foreign visitation to the state increases, demand will increase for those with abilities in foreign language.

Suggested Learning Activities

1. As a class: imagine you are a tour guide at a nearby visitor center. Brainstorm the types of questions a tourist might have for you at that visitor center and figure out how one might ask those things in Japnese, French, and German.
2. With a partner: Practice asking these questions and answer them properly in all three languages. Help one another and take turns! Discuss/review/evaluate as a class.
3. Discuss personal experiences in other cultures/countries. How does it feel to be a visitor? How do you hope to be treated by those who live there?
4. Study the customs and history of the local Native people as a class. Discuss the kinds of information about them that would be interesting and helpful to visitors to your area, and, in pairs or small groups, role-play informal presentations you might make to tourists.

Resources

Alaska Foreign Language Association, c/o Doug Bruce, 415 Farewell St., Fairbanks, AK 99701

Alaska State Division of Tourism, P.O. Box E-101, Juneau, AK 99811

Second Language

What are some greetings in the local Native language?

You'll have to find out. No matter where you live in Alaska, you live someplace which was once inhabited or visited by Alaska Native people. How effective it would be to greet visitors in Tlingit, Aleut, Inuit, Yupik, Athapaskan, Haida, Tsimshian, or any other Alaskan Native tongue!

How do I greet tourists in Japanese, French, and German?

You can take a class in high school. Nationwide there is a renewed interest in foreign language study. Conversational Japanese is being added to the traditional studies of French, Spanish, German and Latin. Though many foreign tourists know at least rudimentary English, make an effort to at least be able to greet them in Japanese, French and German. You'll make their trip all the more enjoyable. Guidebooks are available. You can ask someone in their party.

English	Japanese	English	Japanese
Good morning	*o-ha—yo*	go back (turn around)	*modote*
Good afternoon	*kon-nichi-wa*		
Good evening	*kon-ban-wa*	hurry	*hayaku*
Goodnight (on retiring	*o-yasumi-nasai*	go slowly	*yukkuri*
		stop	*tomatte*
Goodbye	*sayonara*	left	*hindari*
Thank you	*domo arigato*	right	*migi*
I'm sorry, please excuse me	*sumi-masen*	next	*tsugi*
		corner	*kado*
Yes	*hai*	toilet	*toi-re*
No	*i-ie*	information desk	*an-nai-sho*

prefecture (state)	*ken*
city	*shi*
ward	*ku*
district within a ward, or a town	*machi*
a block or group of blocks with a ku or machi	*chome*
"number" for a house or building	*ban*

Some other common geographical terms

river	-kawa or -gawa
bay	-wan
bridge	-bashi or -hashi
lake	-ko
mountain	-yama
line (bus, rail)	sen
station	eki
north	kita
south	minami
west	nishi
east	higashi

English	Japanese
Maybe	*tabun*
Wait a minute	*chotto-matte*
I don't understand	*wakarimasen*
My name is	*watashi wa (for a girl/woman)*
	boku wa (for a man)
You	*anata*
he	*ka-re*
she	*ka-no-jo*
today	*kyo*
tomorrow	*ashita*
yesterday	*kino*
how much?	*ikura deska?*
expensive	*takai*
Anything cheaper?	*Motto yasui no wa?*
I'll buy this	*Itadakimasu or Kaimasu*
telephone	*denwa*
Please telephone and ask	*Denwa de Kiite kudasai*
taxi	*tak-shi*
bus	*bus-u*
train	*densha*
subway	*chika-tetsu*
station	*eki*
ticket	*kippu*
airport	*hi-ko-jo*
street	*michi*
Where is . . .?	*. . . doko deska?*
shop	*mi-se*
stamp	*kit-te*
Police Box	*koban*

English	Japanese
hotel	*ho-teru*
room	*heya*
key	*ka-gi*
eat	*tabe-masu*
drink	*nomi-masu*
meat	*niku*
fruit	*kudamono*
water	*mizu*
hot water	*oyu*
coffee	*co-hi*
tea	*o-cha*
money	*kane*
One	*Ichi*
Two	*Ni*
Three	*San*
Four	*Shil'*
Five	*Go*
Six	*Roku*
Seven	*Shichi*
Eight	Hachi
Nine	*Ku*
Ten	*Ju*
Eleven	*Ju-ichi (10 + 1, etc.)*
Twenty	*Ni-ju (2 x 10, etc.)*
Thirty, etc.	*San-ju (3 x 10, etc.)*
Hundred	*Hyaku*
Thousand	*Man or Ichi-man*
Ten thousand	*(thus, 25,000 is ni man go sen)*

French

Hello– *Bonjour*
Excuse me– *Pardon/pardonez-moi*
Thank you– *Merci*
Yes– *Oui*

Goodbye– *Au revoir*
Welcome– *Bienvenue*
Thank you very much– *Merci beaucoup*
No– *Non*

1– *Un*
2– *Deux*
3– *Trois*
4– *Quatre*
5– *Cinq*
6– *Six*
7– *Sept*
8– *Huit*
9– *Neuf*
10– *Dix*
11– *Onze*
12– *Douze*
13– *Treize*
14– *Quatorze*
15– *Quinze*
16– *Seize*

17– *Dix-sept*
20– *Vingt*
25– *Vingt-cinq*
30– *Trente*
40– *Quarante*
50– *Cinquante*
60– *Soixante*
70– *Soixante-dix*
71– *Soixante-et-onze*
72– *Soixante-douze*
80– *Quatre-vingts*
90– *Quatre-vingt-dix*
91– *Quatre-vingt-onze*
100 *Cent*
300 *Trois cents*
1000 *Mille*

How much? – *Combien?*
That costs five dollars. – *Ça coute cinq dollars.*
Money – *L'argent*
A little – *Un peu*
All – *Tout*

Expensive – *Cher*
Cheap – *Pas cher*
More/again – *Encore*

Time/hour – *L'heure*
When – *Quand*
Tomorrow – *Demain*
Now – *Maintenant*
Soon – *Bientôt*

It is five o'clock. – *Il est cinq heures.*
Today – *Aujourd'hui*
Yesterday – *Hier*
Not yet – *Pas encore*

Sunday – *Dimanche*
Monday – *Lundi*
Tuesday – *Mardi*
Wednesday – *Mercredi*
Next Monday – *Lundi prochain*

Thursday – *Jeudi*
Friday – *Vendredi*
Saturday – *Samedi*

Last Monday – *Lundi dernier*

There – *Là*
Where is the market? – *Où est le marché?*
Where is the store? – *Où est le magasin?*

Here – *Ici*
Near – *Près de*
Straight on – *Droit devant/Tout droit*

Far – *Loin*
Right – *À droite*

Go – *Aller/partir*

Where are you going? – *Où allez vous?*
Where is the car going?– *Où va le camion?*
Where do you come from? – *D'où venez-vous?*

Good – *Bien* Bad – *Mauvais*
How are you? – *Comment allez vous? (Comment ça va?)*
Well, thank you – *Très bien, merci (Ça va bien)*

There is – *Il y a*
What would you like? – *Qu'est-ce que vous voudriez?*
The restrooms are over there. – *Les toilettes sont là.*

Speak – *Parler*
Do you speak English? – *Parlez vous anglais*
I don't speak French – *Je ne parle pas français.*
I speak a little French – *Je parle un peu de français.*

Give – *Donner*
Give me your suitcase, please. – *Donnez moi votre valaise, s'il vous plaît.*

What is your name? – *Comment vous appelez vous?*
My name is ... – *Je m'appele ...*

Commonly heard French words and phrases:

Bateau/bac – Ferry
Train – Train
Sac/Baggage – Luggage
Hotel – Hotel
Peut-être – Perhaps
Chaud – Hot
Ecole – School
Garçon – *Boy*
Docteur médecin – Doctor
Médicaments – Medical supplies
Immeuble – Large (official) building
Goudronée – Asphalt road
Rue – Street
Camion – Truck
Gare – Station
Magasin – Shop
Pension/auberge – Rest-house
C'est possible – It's possible
Froid/fraiche – Cold
Professeur – Teacher
Fille– Girl
Hôpital –*Hospital*
Malade/blessé – Ill/wounded
Chez – House of
Piste – Trail
Route – Road

German

Hello	*Guten Tag*	goo-ten-tahk
How are you?	*Wie geht es Ihnen?*	vee gayt ess ee-nen
very well	*Sehr gut*	zayr goot
Thank you	*Danke Schön*	dahn-keh-shern
Goodbye	*Auf Wiedersehen*	owf vee dayr-zayn
Please	*Bitte*	*bit-tuh*
Yes	*Ja*	yah
No	*Nein*	nine
Excuse me	*Entschuldigen Sie*	en-shool-di-gen zee
Give me	*Geben Sie mir*	gay-ben zee meer
Where is?	*Wo ist?*	voh eest
the station	*der Bahnhof*	dayr bahn-hoft

a hotel	*ein Hotel*	ain hotel
a restaurant	*ein Restaurant*	ain res-tow-rahng
the toilet	*die Toilette*	dee twah-let-tuh
To the right	*Nach rechts*	nakh reshts
To the left	*Nach links*	nakh leenks
Straight ahead	*Geradeaus*	geh-rah-deh-ows
I would like	*Ich mochte*	ikh mersh-ta
to eat	*essen*	ess-en
a room	*ein Zimmer*	ain tzim-mer
for one night	*fur eine Nacht*	feer al-neh nakht
How much is it?	*Wieviel kostet?*	ve-feel kaw-stet
The check, please	*Zahlen, bitte*	tzah-len bit-tuh
When?	*Wann?*	vahn
Yesterday	*Gestern*	geh-stern
Today	*Heute*	hoy-tuh
Tomorrow	*Morgen*	more-gen
Breakfast	*Frühstück*	free-shtick
Lunch	*Mittagessen*	mi-tahg-gess-en
Dinner	*Abendessen*	ah-bend-ess-en

What about some cultural differences among parks and recreation area visitors?

There are lots of cultural differences among visitors, but many of them are prepared to experience a different culture themselves. Expect them to be pretty tolerant of you. Courtesy is the best policy.

Are there other cultural differences to consider in the outdoor recreation field?

It's sometimes not easy to be culturally sensitive. In the field of outdoor recreation, you will be dealing with people not only from different parts of the U.S.A., but from different parts of the world. In some cultures it's okay to butt in, to ask questions out loud. In other cultures it's impolite to assert yourself at all. Visitors in outdoor recreation will ask questions about Alaska Natives. Take some time to find out accurate information about the historical culture local to your area. If you are Alaska Native yourself, all the better. People are sensitive about culture. Generalizations and naïve simplicities have no place in such explanations.

Use Outdoor Recreation Equipment

Equipment and Tools
Teacher Page

Competency: **Operate and maintain equipment and tools**

Tasks:
Identify and use hand tools properly and safely
Demonstrate basic mechanical skills useful in a recreational setting
Operate and maintain tractors, machinery and equipment
Maintain records of use, maintenance, and repair on machinery and equipment
Prepare machines and equipment for storage
Develop a project plan using sketches, scale drawings, bill of materials and cost estimation
Safely construct a woodworking project using basic woodworking skills
Prepare and paint metal, wood and masonry surfaces
Identify, select and use common kinds of hardware
Demonstrate basic electrical repair skills
Demonstrate basic plumbing skills

Introduction

Maintenance skills are useful to virtually everyone. How many people need to know how to change a tire, construct a sidewalk, use a circular saw? The field of outdoor recreation in Alaska always involves some degree of maintenance and construction. Students need to learn a variety of construction and maintenance tasks.

Overview

Some of the best jobs in the area of outdoor recreation involve construction and maintenance of outdoor recreation settings. Maintenance can range from specialized mechanic work for Denali National Park to the professional fixer -upper, mower, raker, fee collector at a private campground.

Suggested Learning Activities

1. Visit the shop or maintenance headquarters of a local, state, or federal agency. Observe the kinds of work performed by maintenance workers there. Interview these workers as to their daily duties, previous training, experiences. Ask them what kinds of skills have come in handy for them on the job , what kinds of records they have to keep, what tools and machinery they regularly operate, and how they prepare tools and equipment for storage.
2. TAKE A SHOP CLASS OR TWO!
3. Invite parents and local professionals who use tools to class to help you to learn the proper use of hand tools, heavy machinery and equipment, and related tools
4. After you are comfortable and skilled in the proper use of tools and equipment, plan and construct a woodworking project : use sketches and scale drawings at first. Prepare a cost estimation to be sure that your project is affordable for you. Select and purchase the appropriate materials. Including hardware. Figure out where you are going to get the appropriate tools and other equipment. Build your project and apply finishing touches, including paint and trim. If electrical wiring is involved, ask an expert for help!

Resources

"Brush Cutting Tools," Data Sheet 427, National Safety Council, 425 N. Michigan Ave., Chicago, IL 60611. *Also available from U.S. Forest Service, Forestry Sciences Lab, Juneau.*

Vocational Materials Library, Office of Adult and Vocational Education, Alaska Department of Education, Box F, Juneau, AK 99811. Construction Trades Curriculum and Construction Trades Resources.

Equipment and Tools

What are some hand tools I will use in the outdoor recreation field?

There's no mystery to the types of tools you would use in an outdoor recreation setting. Many of them would be the same tools you would use in a range of outdoor jobs and professions: on the farm, on a surveying job, on a construction job. Just like you would on those jobs, you'll need to take care of your tools.

You might learn to use specialized tools on the job. Depending on what you're constructing or working with in the particular outdoor setting, tools should not differ. However, those who build trails in remote areas might use particular hand tools related to constructing footpaths. The trail crew which built the bridges over the streams on the Chilkoot Trail, for example, used tools related to wooden suspension bridge construction. Knowing basic skills of handling, carrying, storing and sharpening tools should help you in pursuing employment.

Do I have to be a mechanic to get a job?

That depends on the job. Federal and state governments, in fact, hire quite a number of mechanics. But general fix-it skills on varied equipment will prepare you for the differing experiences that a job working in outdoor recreation may offer.

What mechanical skills do I need to know to work in a recreational setting?

You're going to have to know how to use basic hand tools like wrenches, hammers and pliers. You're going to have to know how to change an auto or truck tire and how to use basic cleaning supplies. If you work for the state or federal government, you may specialize as a mechanic or maintenance person, or in some cases you might be in a remote or small location where you're everything rolled into one: ranger, janitor, gardener, carpenter. It is important to be familiar with basic hand and power tools.

What other machinery and equipment do I need to know how to operate?

The more equipment you can operate, the more qualified you may be in the field of maintenance. There may be less glory in the maintenance field, but often it's a job which offers genuine security and the satisfaction of a job that has tangible value. Standard construction skills such as being able to use a backhoe, front-end loader and forklift are among the common skills needed in maintenance in outdoor settings. Basic skills such as maintaining and troubleshooting engines, hydraulics and other equipment are among those which will improve your chances of employment.

Do I have to keep records?

Many of the jobs in outdoor recreation are jobs for the government. Those jobs require a lot of paperwork! Don't let anyone tell you that what you study in English and math classes is not important. Ask someone with an important job operating equipment in an outdoor recreation setting–paperwork *is* important! Computers now keep track of many of these records. Careful attention to details, a willingness to learn technology, and an ability to write and speak effectively will greatly contribute to your record keeping skills.

Your job might have you order parts on a computer, estimate fuel use for some vessels, or measure the heat loss in a building or structure. Your office skills and ability to write will help. You might have to record the use, maintenance, and repair equipment and buildings. Pay attention in both academic *and* vocational classes. Don't think that someone who works in maintenance doesn't do paperwork. For those who work in private outdoor recreation areas, paperwork is also important part of the business.

What do I have to do to prepare machines and equipment for storage?

That depends on where you are. In many places in Alaska, equipment stored outside is going to be subjected to extremely cold temperatures. You have to winterize motors and prepare equipment for sub-zero temperatures.

Do I need to develop a project plan using sketches, scale drawings, bill of materials and cost estimation?

Maintenance for outdoor settings usually means you have to do a variety of the work yourself. If you work for the government, though the land area of Alaska is large, staffs are small. Costs for contracting work out are high. Even if you don't create your own sketches, scale drawings, bills of materials and costs estimations, you may be involved in their formulation. You can acquire such skills in your industrial education, construction trades, woodworking, drafting and/or computer-assisted drafting (CAD) classes.

Most operations have gone to computerized tracking systems that account for cost of materials and labor. It's important to have good pre-planning for cost comparison purposes.

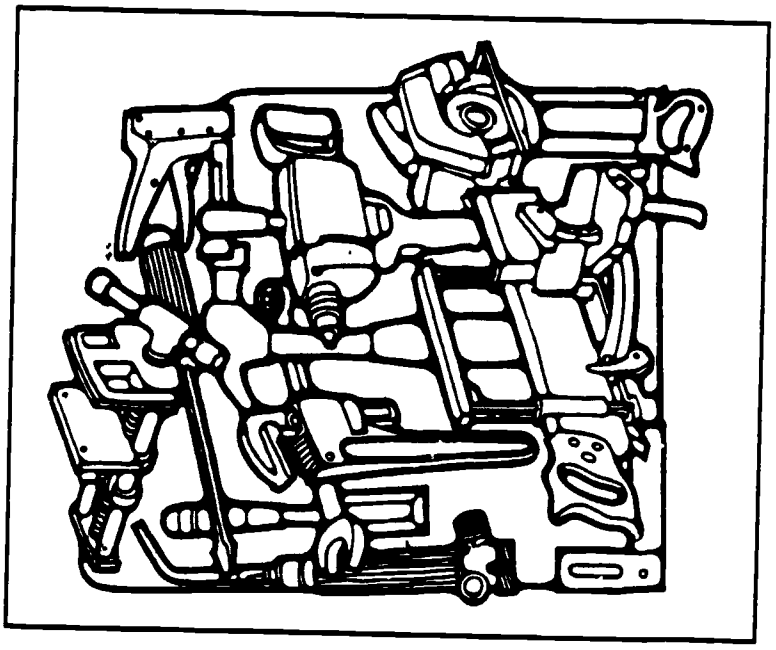
How much woodworking is involved?

Depending on the outdoor recreation area in which you work, woodworking skills could come in very handy–or they could determine whether or you're selected for the job or not. Varied skills with machinery and with construction can contribute greatly to your outdoor recreation job.

What tricks help in the repair and painting of metal, wood and masonry surfaces?

Environmental conditions in Alaska are harsh. They vary widely. From Southeast Alaska's rain-soaked mountains to the very dry conditions of South Central and the North Slope, to the temperate climate of Metlakatla to the harsh extremes of Arctic Village, very few states have such varied conditions. Pay attention to local tricks and requirements. Don't expect what works in one area to work in another.

As a chief of maintenance of one of Alaska's national parks notes: "It is necessary to know what to use on various materials to be painted. Certain measures have to be taken to get good results, such as cleaning, priming, etc. Metals may have to be coated with some type of protective coating that will have to be removed before installing primer coats. Proper surface preparation is an absolute must. One has to have knowledge of what to use when selecting the proper kind of paint to use."



What are some common types of hardware?

A knowledge of tools, fasteners and other types of hardware will better prepare you to work in the maintenance field. Familiarity with construction, woodworking, and mechanics will help you to use such hardware. Additionally, with many sites in the state well removed from retail and wholesale establishments, you may be ordering from catalogs or by phone. You will need to know common terms for various types of hardware. Working in a remote site, your trips to town may be few and far between. A familiarity with hardware will help you in making proper selections when you have the chance.

The chief of maintenance continues: "Any project will require common hardware and tools of a particular trade or trades, i.e. plumbing, carpentry, electrical, etc. The hardware will be determined by the project."

Do I need basic electrical repair skills?

Many outdoor settings in Alaska are far from electrical power. Many of the areas serving visitors or those who work in those areas are served by electrical generators. Troubleshooting maintenance skills include basic electrical repair skills. You will need to know how to install a switch, to test a fixture, and to complete basic wiring.

The chief of maintenance says, "anyone working on anything electrical must have a firm basic knowledge of electrical theory and must be able to read and interpret drawings and schematics. A person has to be able to read and understand electrical codes. Training in this field is critical. Many serious mistakes are made in this field by people who can make something work but don't understand theory and codes so that things work safely." Proper training is a must.

Do I need basic plumbing skills?

Obviously outdoor recreation means people management. One of the basic areas of people management is providing for their basic necessities. One of those necessities is drinking water and rest rooms. Basic plumbing skills can definitely make you more employable.

As the chief of maintenance notes, "Basic plumbing skills must include knowledge of codes, both local and national. The employee must have knowledge of tools, supplies and equipment of the trade. The employee must be able to work from drawing specifications."

Photography
Teacher Page

Competency: **Take pictures and/or assist visitors in taking pictures**

Tasks:

Describe the major types of cameras and purposes of each
Identify basic parts of the camera and their function including:
- a. body
- b. lens
- c. shutter
- d. diaphragm
- e. viewer
- f. film holding device

Recognize major characteristics of films including:
- a. color
- b. black/white
- c. speed
- d. type (slides, prints)
- e. ease of development
- f. size (35mm, disc, instant, etc.)

Select appropriate film for purpose
Use a 35 mm camera determining/defining/adjusting:
- a. F-stop
- b. shutter speed
- c. film speed
- d. depth of field
- e. contrast (b/w)
- f. graininess
- g. special effects (panning, shading, etc.)
- h. focus

Identify the steps in taking a picture
Explain important accessories for cameras and purpose including:
- a. tripods
- b. extension tubes
- c. telephoto lenses
- d. macro lenses
- e. filters
- f. cleaning kit
- g. flashes

Describe methods for photographing wildlife, landscapes, people, and indoor versus outdoor subjects
Operate common video cameras

Introduction

The field of photography is in its second century. The camera allows the visitor to record the visit, to record a moment in time. A multi-billion dollar industry, photography is firmly intrenched in many areas of outdoor recreation. In fact, the field can be said to be a *part* of outdoor recreation in and of itself, as many amateur and professional photographers alike take their photos primarily in the out of doors. Knowing something about picture-taking is essential.

Overview

There aren't many jobs as "photographer's helper," that is, walking around with a tourist, like a golf course caddie, telling them which shots to take. But the truth is that in the outdoor recreation field, just about every visitor has a camera and they often ask the ranger or tour guide or hotel clerk questions about photogtraphy. Additionally, those who work in law enforcement for outdoor recreation may take pictures of an accident scene or violation. There is also the unquenchable thirst for wildlife photos and scenics that calendar and poster makers generate. If you work in the field of outdoor recreation, it helps to know something about cameras. Skill in photography can help you obtain and keep a job.

Suggested Learning Activities

1. Invite a photographer to class to discuss tips for successful picture-taking.
2. Make pinhole cameras to understand how the more complicated tools work.
3. Use 35 mm, instamatic, and instant cameras to photograph similar subjects in similar conditions. Compare the three. Experiment with different apertures and shutter speeds to find out how these conditions affect depth of field, subject lighting.
4. Experiment with black-and-white photography. If you have access to a darkroom, you may want to develop and print your own film.

Resources

Eastman Kodak Company, 343 State St., Rochester, NY 14650. *Produces the publications below and others.*

Books and Pamphlets:

A number of photo books and magazines are available at any library, at newstands, at photo stores, or from manufacturers, including Eastman Kodak, listed above. Those with an interest in this field should contact their local library. Additionally, a number of excellent periodicals dealing with photography are available at any newstand.

How to Make Take Pictures, AC-36, © Eastman Kodak Company. *Portions reprinted courtesy of Eastman Kodak Company.*

"KODAK Self-Teaching Guide to Picture-Taking, AC-2, © Eastman Kodak Company. *Portions reprinted courtesy of Eastman Kodak Company.*

"KODAK Self-Teaching Guide to Using a 35 mm Camera, AC-1, © Eastman Kodak Company. *Portions reprinted courtesy of Eastman Kodak Company.*

"Picture-Taking in 5 Minutes," AC-13, © Eastman Kodak Company. *Portions reprinted courtesy of Eastman Kodak Company.*

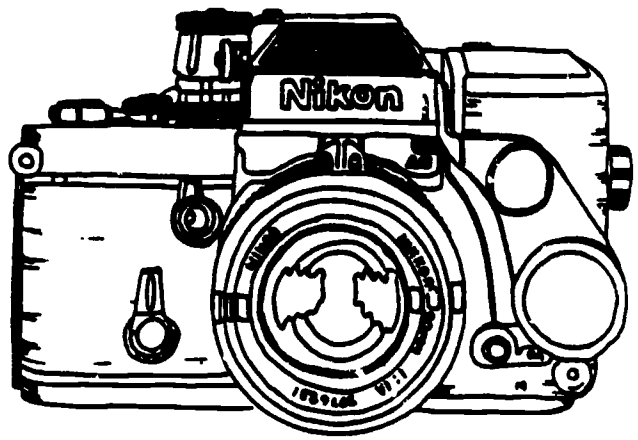
"Photographic Techniques For Monitoring Resource Change At Backcountry Sites", Les Brewer.—[Broomall, PA] : Northeastern Forestry Experimental Station., 1984. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustration and reference.*

Photography

What are the major types of cameras ?

Some types of cameras allow you to look through the lens in order to take a picture (a *single lens reflex—SLR)* camera; other cameras use a viewer to line up the picture. These latter types of cameras might be instamatic or disc-type cameras or even the new disposable cameras.

Cameras are also categorized by the type of film they shoot. Cameras which shoot 35 millimeter film are called 35 mm cameras. Those which shoot 4 x 4 film are called 4 x 4s. Many 35mm cameras today are becoming "smart". With the advent of the computer chip, automatic cameras make taking 35mm pictures as easy as aiming and shooting. The camera can read and control the amount of light, the speed of the exposure, the flash, and even wind the film to the next picture. Such "smart" cameras are becoming increasingly common.



What are the basic parts of the camera and how do they work?

The camera has a body, lens, viewer, and sometimes flash. Film is a plastic material coated with chemicals which are sensitive to light. Cameras are the devices which control and direct the light which *exposes* the film. Sophisticated cameras house a *light meter* which allows the photographer to determine the intensity of the light. There are two ways to control the light which exposes the film: by controlling the *amount* of light and by controlling the *speed* of exposure. Think of light like a stream. The camera is like a dam. The *shutter* on the camera is like a gate in the dam which opens and closes. A wide gate will allow more water in. So will a gate that opens and closes very slowly. Sophisticated *single-lens reflex* cameras house devices which control the speed and and how wide the shutter (the gate) on the camera opens. The width of this opening, or *aperture*, is called the *F-stop*. Less sophisticated cameras have shutters which always operate at the same speed, and apertures which are fixed. *Automatic cameras* are cameras in which the speed and/or the aperture is controlled automatically, often by micro chips.

What are the major characteristics of films?

According to Kodak, "Film is a light-sensitive material that records an image. Just as there are different types of cameras, there are different types of films. When you purchase film, it is important that you get the right film for your particular needs. Keep the following points in mind:

1. Specify whether you want color prints, black and white prints, color slides, or instant prints. Each type of film is intended to make only one of these four kinds of pictures. However, you can have color prints made from color slides and from instant prints. You can also have color slides made from color negtives.

2. Every camera uses film of a particular SIZE (indicated usually by a number--for example, 110, 126, 127, 135, or disc). Check the camera instruction manual to see what size film your camera uses. If you cannot locate your manual, take your camera with you when you go to buy film. If you have an instant camera, be sure to buy film designed for your camera."KODAK Customer Service Bulletin," AC-13, June, 1985 p. 2).

Today, many photographers prefer to shoot color, though black and white is still common. Many photographers who shoot black and white pictures do so because they develop their film at home. Equipment for developing black and white film at home is relatively inexpensive compared to that for developing color film. Photographers may shoot color prints or color slides Slides are much less expensive than prints, but of course you have to have access to a slide projector to enjoy them. Many people prefer prints because you can sit around a picture album and enjoy them. Some photographers shoot slides (which are cheaper), pick the best slides, and then have prints made from them. Additionally, many photographers buy their film in bulk with slide processing included, gaining a considerable savings.

Films are rated by speed, which indicates how light-sensitive the film is, that is how "fast" the film exposes. Film speed is indicated by numbers. A film speed of 25 indicates that the film exposes very slowly. A film speed of 1000 indicates that the film exposes very quickly. So, in bright light you could use a slower film. One generality of film is that the slower the film, the less "grainy" more sharp the picture. There's a science to it all. Suffice it to say that some professional photographers use 25 film for the clearest of pictures, the bulk of photographers use 64 film, except in overcast light or indoors when they would use 100 to 400 film. Using slower films indoors might require a flash; outdoors those films would require a longer exposure time. A "smart" camera would figure it all out for you. You would, however, need to indicate the film speed when you set your "smart" camera's settings.

How do I know what film to select?

Photographers select films by type, speed, and brand. Professional photographers use film brands such as *Kodak*, *Fuji*, and *Agfa*. Numerous less well-known companies also manufacture film. Non-SLR film comes in set film speeds, as those cameras usually have a set aperture and film speed. With SLR (usually 35 mm cameras), you can choose your film speed by the type of place you'll be visiting. If you'll be in a place where it's usually sunny and there's plenty of light and you want to shoot outdoors, you can choose a low numbered film (such as 64 or even 25). If you'll be in a place where it's cloudy or overcast a lot, and you want to shoot scenic shots, you might choose 100 or 400 film. Additionally, if you will be moving (shooting from a boat, train or other moving object), a faster film might be a good choice. Talk it over with your camera dealer. Camera dealers can tell you the right film to select for the pictures you want to take.

So how do I use a 35 mm camera?

If the 35 mm camera you'll be using is a "smart" or automatic camera, you may just have to point the camera and shoot. But it may not be quite so easy as that. You'll still have to know *something* about how to focus the camera, like exactly what portion of the frame you should focus on when you have the camera take its automatic readings. Consult the manual.

Historically, SLR, 35 mm or what is termed "adjustable" cameras allowed control of three basic settings: focus, shutter speed, and lens opening. As Kodak notes "to get a good picture, you need to adjust the shutter speed and the lens opening settings to control the amount of light entering your camera. The shutter speed controls the length of time the shutter will stay open to allow light to reach the film. A slow shutter speed lets light in to expose the film for a long time. A fast shutter speed lets light in to expose the film for a short time. The lens opening controls how much light will enter the camera while the shutter is open. A large lens opening lets in a lot of light. A small lens opening lets in a small amount of light.

"To get good pictures, the film in your camera needs to be exposed to the same quantity of light for every picture. On a normal sunny day, you will use a fairly fast shutter speed and a medium lens opening so that the correct amount of light will reach the film and you will get a properly exposed picture. On a cloudy day, the light isn't as bright and you need to either let light into the camera for a long time, or let in a lot of light for a shorter time, or possibly both–a lot of light for a long time.

"Find the shutter speed settings on your camera and learn how to change them. The camera instruction book will explain how to do this. Shutter speed settings are usually numbered 30,60, 125, 250, 500–or on older cameras 25, 50, 100, 200. The numbers refer to fractions of a second, such as 1/30 or 1/500. ("Kodak Self-Teaching Guide to Using a 35 mm Camera, AC-1" pp. 3-4)

As Kodak continues in another publication, "For most daylight pictures, you'll probably want to set your shutter at 125. This shutter speed, 1/125 second, is the one usually recommended on the film instruction sheet for sunny-day pictures. It helps reduce the effect of camera movement, which is the number one picture spoiler. Of course it's still important to hold the camera *very* steady.

"The openings in your camera that determine the *amount* of light that reaches the film are called 'lens openings.' These numbers are called 'f-numbers.' The following range of f-numbers is typical on most adjustable cameras: 2.8, 4, 5.6, 8, 11, 16, 22. The smallest number on the lens refers to the biggest lends opening. The largest number is the smallest lens opening. ...As with shutter speeds, when you move from any lens opening to the next larger one (for example, f/11 to f/8), you let in twice as much light. (How to Take Good Pictures, AC-36," pp. 19-20)

As Kodak continues, "There are two easy ways to determine which lens opening and shutter speed you should use to get a well-exposed picture. One way to determine the exposure is with an *exposure meter*. Many cameras have built-in meters, or you can use a separate meter. As with some automatic cameras, you must 'tell' the meter the speed of the film you're using. ...After you've set the film speed on the meter, use the meter according to the manufacturer's recommendations.

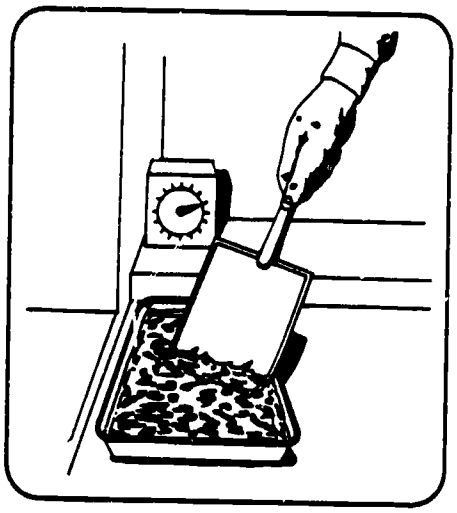
..."The other way to determine the exposure is with the film instruction sheet. There's an exposure table on each film instruction sheet, giving the shutter speed and lens opening for outdoor lighting conditions from a bright, sunny day to a dark, overcast day. Use the shutter speed and lens opening listed under the lighting condition that is closest to the lighting on your subject." (How to Make Good Pictures, AC-36, pp. 20-21)

What are the steps in taking a picture?

Remember that to get sharp pictures, you must hold the camera steady. Get close to the subject. Obviously you're not going to get close to bears or other dangerous wildlife. For wildlife shots, you will want a telephoto lens.

As Kodak notes:

- Keep your camera steady. Stand still and grip the camera firmly with both hands while holding your elbows close to your body. Gently squeeze the shutter release.
- Take close-ups of your subject when possible.
- With most cameras you can get as closeor 5 feet. With some cameras you can get closer. Check your camera manual.
- Keep it simple. Have one center of interest and avoid cluttered backgrounds.
- Keep them busy. Have your subjects doing something natural instead of stiffly staring at the camera.
- Include a foreground subject when shooting distant scenes. ("Picture-Taking in 5 Minutes, AC-3" p. 3)



What are some accessories for picture-taking, and how do I use them?

Cameras have a wealth of accessories available. Tripods allow you to keep the camera perfectly still. A still camera can take longer exposures in less light, increasing the *depth of field*. A tripod allows a lot more potential in shooting.

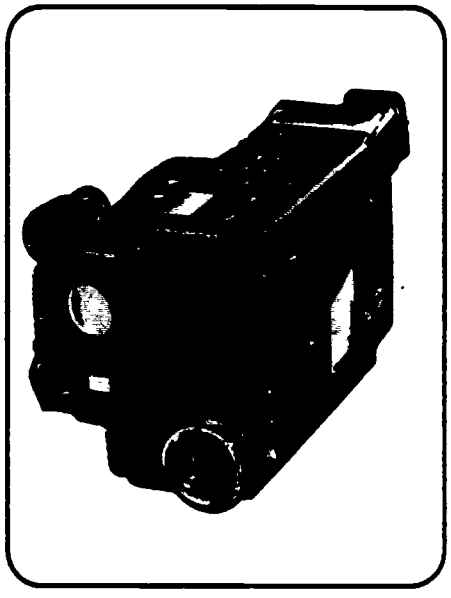
Telephoto lenses magnify the image so that you can "fill the frame" without actually being there. Since the most interesting pictures are close-up shots, telephoto lenses allow you to take pictures of wildlife safely. Magnifying an image, however, diminishes the light available, so typically a camera with a telephoto lens is held on a tripod. Extension tubes increase the minimum focus length and are used to get in closer to flowers and other small objects. Macro lenses allow close-up photography of small objects, flowers, and insects. Some lenses are both macro and standard or zoom lenses, with a number of capabilities. Filters control the spectrum of light which enters the camera. Flashes are useful for indoor shots and for close-up outdoor shots, especially when taking a close shot against a very light background. Cleaning kits for lenses and cameras are available at camera dealers.

What are some methods for photographing wildlife, landscapes, people, and indoor versus outdoor subjects?

If any one person could tell you how to make art, everyone would go out and make art pretty easily, eh? There is a whole science to photography. If you're interested in taking pictures for money, there's a lot of competition out there, too. Those who get great pictures spend a lot of time at it. They follow trends and tips offered in photography magazines, take courses when they can, and ask questions of other, more experienced photographers.

How do I use a video camera?

Many tourists traveling through Alaska nowadays will have some 5-pound black box on their shoulder which they're constantly pointing first in one direction, then another. That black box is a video camera. The field of photography is changing fast, and the lure of having inexpensive *sound* motion pictures which can be played on the family TV has brought many VCRs to outdoor recreation settings. You may, in the course of working in an outdoor setting, get some questions like "How do I use this thing?" or "Do you have any suggestions on using my VCR camera? If you don't know, don't pretend to know. If you do know, share. VCRs are *motion* pictures. They need to be filming motion. For stationary scenes like landscapes and mountain scenes, the photographer needs to try to get something moving in the foreground, either hikers or wildlife.



Truck or Bus Driving
Teacher Page

Competency: Drive a truck or bus

Tasks:
Check all engine fluids
Operate a three speed manual transmission
Operate a four speed manual transmission
Practice caution while transporting passengers
Engage four-wheel drive
Use winch

Introduction

From taxi drivers in Nome to bus drivers in Anchorage, to those who take visitors on jeep tours at Katmai, drivers are the chauffeurs of the traveling tourist. Skill and experience in driving can help someone get a job in many areas. Jobs driving customers offers good experience and an important level of responsibility. The emphasis on safety while transporting tourists underlines the number one priority of those providing visitor services–safety. Additionally, most bus drivers offer an interpretive tour as part of the bus tour. The ability to talk about the the human and natural history of the area is an important part of this employment.

Overview

Nearly any tourist destination in Alaska has openings for truck or bus or taxi drivers. For many entry-level employees in the outdoor recreation field, this might be one of their first jobs. This segment of the outdoor recreation field is expanding. In Alaska, school bus drivers require special training and licensing. Tour bus drivers must apply for and receive a chauffeur's license, entailing a medical exam, a criminal and driving record check, good driving status, and a $15 fee. Individual tour bus companies usually provide more extensive training for insurance and safety purposes but the amount of prerequisite training varies from one company to the next.

Suggested Learning Activities

1. Ask a truck driver or a bus driver to class to discuss responsibilities on the job and to demonstrate routine procedures such as checking engine fluids, operating 3- or 4- speed transmissions, safety precautions,and the use of four wheel drive and winches.
2. Practice routine maintenance procedures (checking fluids, belts, engine compartment, tires) and driving of various 3- and 4- speed trucks and buses. If a winch or four-wheel drive is available, practice using it.

Resources

Contact local or regional companies conducting such tours. Every year drivers are needed. Getting the message across to potential drivers is very much in the tour operator's interest.

Books and Pamphlets:

Alaska School Bus Driver's Manual. Alaska Department of Education, P.O. Box F, Juneau, AK 99811

Ketchikan Area Safety Notes. *Includes what you and we can do about winter driving and boating. Available through U.S. Forest Service, Ketchikan.*

"Orientation to Backroad Driving," State of Washington, Department of Natural Resources. *Available from U.S. Forest Service, Forestry Sciences Lab, P.O. Box 909, Juneau, AK 99802.*

Truck or Bus Driving

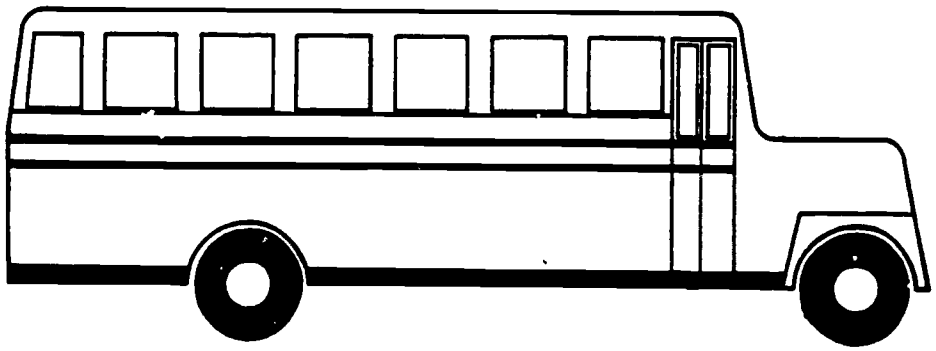
Do I need to check all engine fluids?

Many jobs transporting passengers require the operator to go through a systematic check of engine fluids before each day of operation. It is against the law to move or cause to be moved any vehicle that is in an unsafe condition or that has necessary equipment on the vehicle that does not work properly. (13AAC 04.002) Your employer will tell you the exact procedures for a pre-trip inspection, but it's a good idea to look over your vehicle before starting the engine.

Check the exterior of the vehicle before starting out. Look for spots on the ground where fluid might have dripped. Look for damage from vandalism. Under the hood, check the oil level, check the coolant level, and check the belts on the vehicle. Belts should have the proper tension and should not display cracks or frayed edges. They should not have too much "give." If so, they may need to be adjusted. Check the engine compartment for a loose air cleaner, broken wires, or leaks. You may want to include a check of automatic transmission fluid and brake fluid reservoir. Do not start the engine until the proper corrections have been made.

How do I operate a three speed manual transmission?

It is a rare vehicle today which has a three-speed manual transmission, though some pickup trucks may have three speeds "on the column." Those who are accustomed to operating a four-speed transmission "on the floor" should be able to adapt simply to shifting on the column. The coordination involved in operating manual transmissions usually involves synchronizing the clutch with smooth movement from one gear to another. Transmission columns usually have diagrams showing the shift pattern of a particular transmission. If not, check the glove compartment for the owner's manual. You'll find the shift diagram there.



Four speed transmission

What do I need to know to operate a four speed manual transmission?

Most people who know how to drive today know how to operate a four-speed transmission. Being able to operate a four-speed transmission is often a prerequisite to working in an outdoor setting. If you don't know how to operate a four-speed, you'll need to learn. Though automatic transmissions are convenient, many smaller vehicles in production have a stick shift. Smooth shifting and smooth clutch release will ensure a long life for the transmission.

How do I engage four-wheel drive?

It depends on your vehicle. On older vehicles you not only engaged four-wheel drive in the cab, you also had to hop out and engage the hubs. The head mechanic, the person you bought the vehicle from, or the owner's manual will explain how to do that. Many more recent vehicles allow you to engage four-wheel drive from inside the vehicle. Systems differ, so consult the manual. But remember that four-wheel drive is not required for typical road conditions. You'll need to shut it off when not needed (which in many cases is most of the time), unless of course it's in an even newer vehicle which automatically engages and disengages according to need.

How do I use a winch?

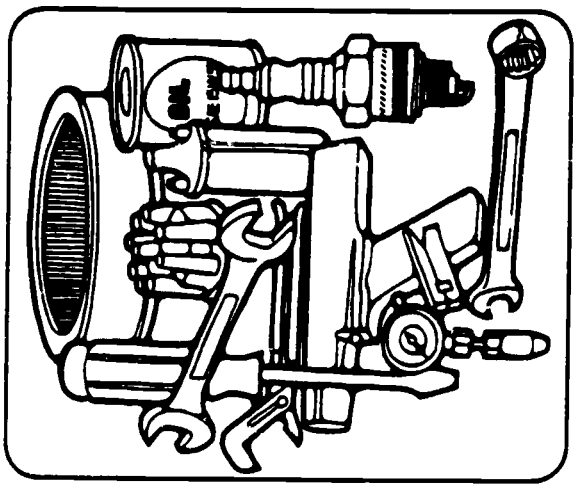
A winch is a device, usually attached to the front of a vehicle, used for pulling or tugging. Most small winches are electrical, operating off the direct current of the vehicle. Other, more powerful winches are directly powered by the transmission of the vehicle. Winches are often standard equipment on military or rough-use recreational vehicles, as well as those operated in remote, rough settings. A winch is a valuable automotive safety device, allowing a truck or Jeep axle-deep in mud or muck to literally pull itself out of the mire by its own power, providing the winch's steel cable can be unreeled and properly attached to a fixed object such as a boulder or tree. Winches are rated by their pulling power. They are usually operated while the engine is running, via an external switch, which allows for quick shutdown.

What precautions will help me to safely transport passengers?

When you're operating a vehicle you are much like the captain of a vessel at sea–you are responsible for what goes on. Your passengers need to be aware of safety features of the vehicle. They must remain seated while the vehicle is in motion; their hands and heads must remain inside the vehicle at all times. They must not interfere with the operation of the vehicle either with excessive noise, interfering with the driver's ability to hear, or with flashlights or other illuminating devices which could reflect in the driver's eyes.

The driver must obey all laws, especially the speed limit. It must be noted that the posted speed limit is the maximum allowable speed limit for *conditions*. If the road is slick, if fog or smoke obscure vision, if hazards of the thoroughfare interfere, the maximum speed should be the maximum allowable for the prevailing conditions.

As for the interpretive message offered to the passengers, study up on the human and natural history of the area. Talk slowly and concisely. Use a little humor. Drive slowly when you come upon an example of something you have talked about. Answer questions, but don't let visitor questions interfere with your driving. There are plenty of turn-offs along the road where you can pull over to answer in depth. If you don't have a loud speaker system, limit your talking to such turn-offs. You definitely don't want to take your eyes off your driving to answer any questions.



Driving an ATV or ATC
Teacher Page

Competency: **Drive a four-wheeler, three-wheeler or other ATC**

Tasks:
Wear a helmet
Operate ATV or ATC safely
Perform a safety demonstration on ATVs or ATCs
Fuel the ATV or ATC
Operate ATV or ATC only in designated areas
Tow and back trailer safely

Introduction

All terrain vehicles are a major force in outdoor recreation in many parts of Alaska and the United States. Small four-wheelers, dirt bikes, and the new craze, mountain bikes, all make remote areas accessible. Equipment is not prohibitively expensive and is very attractive for those who like to tour or race across wild terrain. On the negative side, ATVs and ATCs have contributed to numerous injuries and fatalities. In fact, in just the last few years the commercial sales of three-wheeled vehicles was banned in the United States. Additionally many outdoor settings in the U.S. have experienced extensive damage at the hands (and at the treads of) over-zealous ATV and ATC operators. Many trails and other recreational settings have been declared off limits to motorized use.

Overview

ATVs and ATCs are often very familiar to students. Employment in outdoor settings may call for use of either or both. Often rangers, technicians or others in such outdoor settings use the vehicles to patrol backcountry areas. Skills on such vehicles may offer an edge in employment. Additionally, recreational users can benefit from safety tips related to such vehicles as accidents and injuries on ATVs are shockingly high. Besides use of the vehicles for recreation, for outdoor setting patrols and management, many sales and service jobs relate to ATVs and ATCs.

Suggested Learning Activities

1. Ask a public safety officer to class to discuss laws and safety precautions to consider while operating an ATV.
2. Wearing helmets, take an outing on ATV's, practicing operating the vehicles safely in designated areas. If trailer is available, practice towing and backing it.

Resources

Small Engines and Outboard Marine Mechanics Curriculum, Office of Adult and Vocational Education, Alaska Department of Education, P.O. Box F, Juneau, AK 99811

Books, Pamphlets and Videos:

All-Terrain Vehicle (ATV) Maintenance Manual, 2nd Edition, Intertec Publishing Corp., P.O. Box 12901, Overland Park, KS 66212, 1988

"ATV Owner's Manual Supplement," *Available from any ATV dealer. Honda publication S4027, Kawasaki: 99969-3—3; Suzuki: 99923-09884; Yamaha: LIT-17626-0-00*

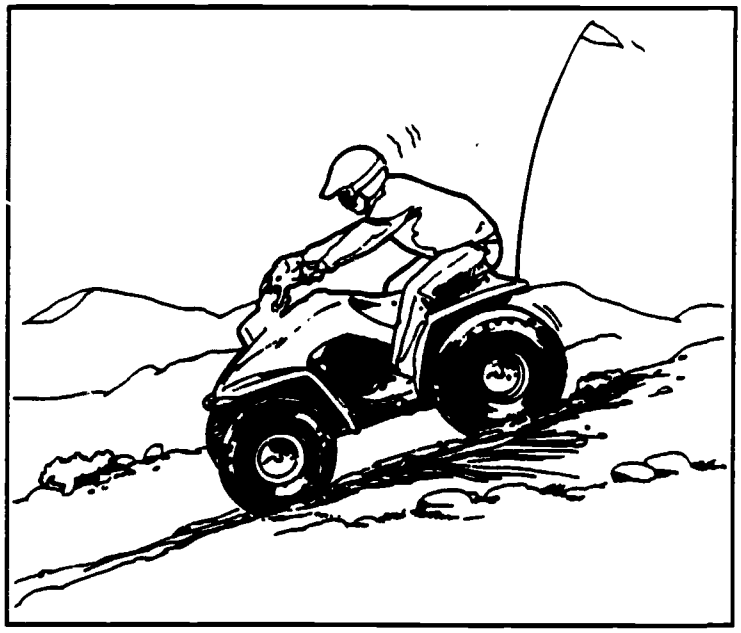
"Fun and Safety: The Winning Combination," *Available from Honda Dealers.*

"Honda ATV Safe Ride Guide, " *Available from Honda Dealers.*

"Off-Road Vehicle Recreation," Bureau of Land Management pamphlet.

"Off-Road Vehicle and Other Traffic Zoning," Chugach National Forest, *available through U.S. Forest Service, Chugach National Forest.*

"Revved up and Roughed Up: Three Wheelin' in Alaska," 20 minute VHS video, 1985. *Available through the Alaska State Film Library, Cooperative Extension Office, or from KYUK Video Productions, Pouch 468, Bethel, AK 99559 (907) 543-3131. Two dramatized accident sequances alternate with the testimony of real victims of three wheeler crashes.*



Driving an ATV or ATC

Do I have to wear a helmet?

Alaska state law does not require a helmet while operating an ATV or ATC either on or off the road. Some interpret that fact as "you have the right to kill yourself if you want to." The human skull offers powerful protection, but a spill at 30 miles per hour on at ATV can damage even the most hard-headed among us. Wear a helmet. Your skull will thank you for it.

Are there some other tips for operating an ATV or ATC safely?

A good share of the accidents on ATVs can be attributed to reckless operation or alcohol or both. As with other vehicles, firearms, or with any other device which can lead to injury or death, alcohol and responsible operation of these devices don't mix. Another area to consider is the recent class-action ruling concerning three-wheelers. Three-wheeled ATVs have been deemed prone to overturning. The vehicles aren't safe. While dealers are no longer permitted to sell three wheelers, a good number of these vehicles are still in operation. Take extra care when operating a three wheeler. Remember they can tip back and when taking a turn at speed, are prone to throwing the rider.

Should I promote safety on ATVs?

You bet you should. As anyone who has lived just about anywhere in Alaska can testify, ATVs aren't just driven by adults. They aren't just driven by teenagers. Often these powerful little vehicles are driven by children. The vehicles are fun to operate but reckless operation can lead to serious injury or death. In many Alaskan communities ATVs are the workhorse of the village. In outdoor recreation, they open up jeep roads and terrain otherwise inaccessible. But the machines need to be treated as the little workhorses that they are.

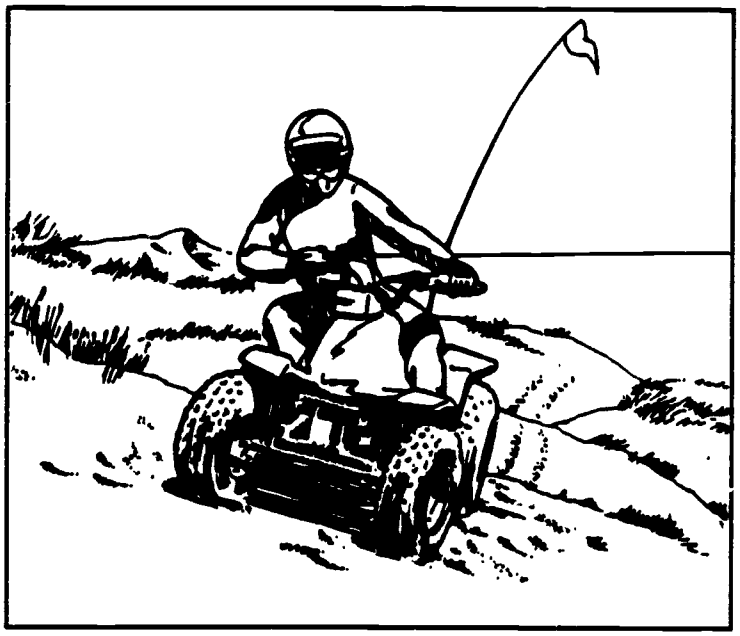
An excellent Supervised Occupational Experience Program (SOEP) project would involve developing and performing a safety demonstration on ATVs or ATCs in your park, village, or community. The program would be of special benefit to younger riders and would promote discussion of the special hazards of ATV operation.

How do I fuel the ATV or ATC?

Very carefully. Gasoline should be stored away from flame and extremes in temperature. Keep the gas in a building away from where you live, far from stoves and other flames. Keep gasoline only in approved containers. Approved containers are red in color and are clearly marked with the words "GASOLINE–EXTREMELY FLAMMABLE." Step away from the ATV or ATC when fueling, and avoid breathing the fumes. Gasoline vapor is explosive. Never smoke around gasoline. Keep spillage to a minimum. Don't fill the tank all the way to the brim. If you have spilled gasoline on the ATV or ATC, allow the gasoline to evaporate before restarting the machine. Also, replace the gasoline can or nozzle where you got it before starting the machine.

Can I go anywhere on my ATV or ATC?

You might see yourself whipping through wild and remote areas, the wind flying, your hair wild, pushing through places no one has gone before. That's not the way it's supposed to be. As anyone who's tried to lift an ATV or ATC can attest, the vehicles weigh a lot. With your weight atop the machine and with equipment you may be transporting, and treaded tires whirring at a rapid rate, you can throw a lot of mud. In fact, you can mat vegetation, tear ruts, disturb hikers, and frighten wildlife. You should operate your ATV or ATC only in designated areas and not on paved roads. Operating the vehicle on an undeveloped road or jeep trail is usually a safe bet. You need to ask the local fish and wildlife protection officer about designated areas for off-road vehicles. If you want to drive on private land, get permission from the land owner *before* you set out.



How do I tow and back a trailer safely?

ATVs used for utility purposes in Alaska often tow small trailers. ATV trailers are pretty easy to tow and back. They are small and light and, unloaded, you can easily move them around by hand. Something to remember while towing the trailer is that on rough roads, both full or empty, trailers towed at speed bounce. An out-of-control trailer can spill the rider. Tow trailers on rough terrain at a much lower speed than you would normally operate.

Like the tow sled, the ATV trailer must be operated at a safe speed. Loads can bounce out, and a bouncing trailer can cause an accident. Don't overload the trailer. Keep trailer tires at recommended pressure. Manufacturers offer the following tips:

- Never exceed the stated load capacity for the ATV
- Cargo should be properly distributed and securely attached.
- Reduce speed when carrying cargo or pulling a trailer. Allow greater distance for braking.
- Always follow the instructions in Owner's Manual for carrying cargo or pulling a trailer.

Using a Firearm
Teacher Page

Competency: Use a firearm

Tasks:
Pack and carry a firearm safely
Obtain proper ammunition for firearm
Load and fire a shotgun using slugs
Load and fire a shotgun using buckshot
Load and fire a high-powered rifle
Clean and care for firearm
Store firearm safely

Introduction

Firearm sales is a major business in the United States. In terms of outdoor recreation, firearms are a prominent part, especially in hunting. With enormous areas of the state designated wildlife refuges and the bulk of the remainder of the state in state and federal hands, sports hunting will continue to play an important role in the state's economy. Also, firearms are used in the outdoor recreational field for bear protection and for law enforcement. Knowledge of firearms and accessories, though not always a prerequisite to a job in outdoor recreation, is certainly an asset. Employment related to the sales and service of firearms and accessories will offer continued employment in the years to come.

Overview

Though direct employment related to using firearms is rare outside of the military and law enforcement, employment related to sales and service of firearms is common. Any town in the state has stores which sell firearms. Many outdoor recreation jobs call for experience using firearms, and outfitters and guides of course need to have more than just a general knowledge of firearms.

Suggested Learning Activities

1. Invite a representative from the National Rifle Association to talk with your class about gun safety.
2. Practice loading, firing, and cleaning a shotgun and a rifle at an approved range. Follow safety tips listed on page 39.
3. Create a colorful, neatly-labelled poster reminding people of safety tips for using guns.

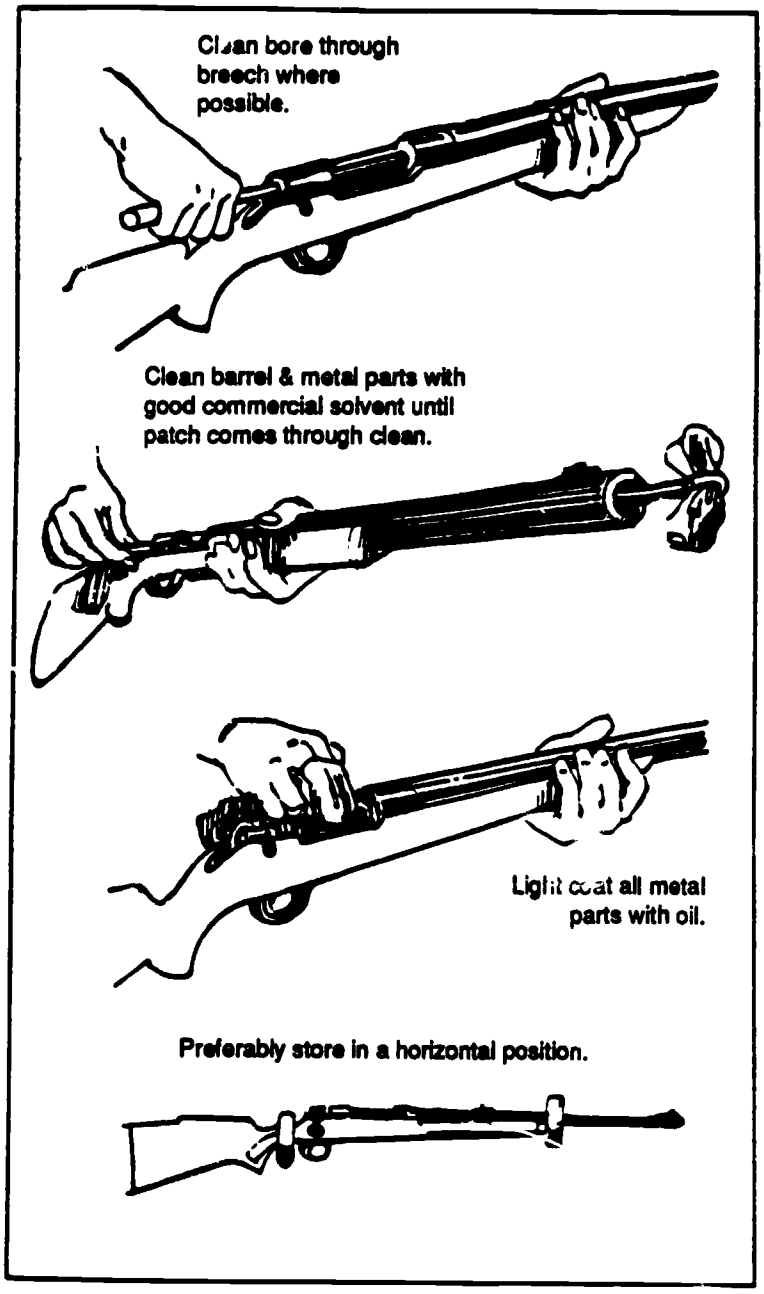
Resources and Organizations

Alaska Gun Collectors' Association, Box 10-1496, Anchorage, AK 99511
Alaska Professional Hunters Association, 301 E. 77th, P.O. Box 91932, Anchorage, AK 99509
College Cubs Rifle Club, 469 NRA Lane, Fairbanks, AK 99701
Cooper Landing Rifle and Sportsmen's Club ,P.O. Box 677 Cooper Landing, AK 99572
Elmendorf Rod and Gun Club, Box 786, Elmendorf AFB, AK 99506
Fairbanks Trap Club, P.O. Box 1447, Fairbanks, AK 99707
Fort Wainwright Rod and Gun Club, Fort Wainwright, AK 99703
Homer Rifle and Pistol Club, P.O. Box 234, Homer, AK 99603
Juneau Gun Club, P.O. Box 2444, Juneau, AK 99803
Ketchikan Rod and Gun Club, Box 6391, Ketchikan, AK 99901
National Rifle Association, 1600 Rhode Island Avenue, N.W., Washington, DC 20036
Stikine Sportsmen, Wrangell, AK 99929

Territorial Sportsmen, Inc., P.O. Box 20761, Juneau, AK 99802
U.S. Revolver Assn., 69 Alvin St., Springfield, MA 01104
Wrangell Rod and Gun Club, Box 701, Wrangell, AK 99929

Books:

Basic Hunter's Guide. National Rifle Association, P.O. Box 96031, Washington, DC 20090-6031. *Quotations from this publication used by permission of National Rifle Association.*



Using a Firearm

How do I pack and carry a firearm safely?

No matter what the circumstances, treat each and every firearm as if it was loaded. Never point the firearm at a human being under any circumstances, unless of course you are forced to to protect your life or someone else's. If your outdoor recreation job involves law enforcement, you may very well be issued a firearm or firearms as part of your employment. In that case, you will be trained in packing and carrying the firearm as part of your job training. Fish and Wildlife Protection officers receive extensive training at the troopers' academy. If you are carrying the firearm for bear protection, you may receive some training as part of your job. Whatever the case, you should be thoroughly familiar with the firearm you are carrying, and you should practice firing it on a range on several occasions before you pack and carry it with you.

Some tips for safe packing and carrying include the following from the National Rifle Association:

1. *Always point the muzzle in a safe direction.*
2. *Keep the action open and gun unloaded until ready to shoot.*
3. *Keep the action open and gun unloaded until ready to use.*
4. *Know how the gun operates.*
5. *Be sure your gun and ammunition are compatible.*
6. *Carry only one gauge/caliber of ammunition when shooting.*
7. *Be sure of your target–and what's beyond.*
8. *Wear eye and ear protection as appropriate.*
9. *Don't mix alcohol or drugs with shooting.*
10. *Be aware that circumstances may require additional rules unique to a particular situation. You are responsible for gun safety.*

What ammunition should I use?

Any gun or sporting goods shop can help you to decide on the proper ammunition for your firearm. Additionally, sports groups, national organizations (such as the NRA), and libraries offer a wealth of materials to help you make the right selection. Don't experiment. One safety note: the NRA suggests that you not carry more than one type of ammunition with you at once, so you don't put the wrong ammunition in your gun, inviting a mishap.

What special tips should I think about for shotgun slugs?

Alaska is bear country. Though some purists oppose carrying a firearm under any circumstances, campers and hikers in bear country, often carry a firearm for bear protection. Typically, for the best bear protection, many carry the shotgun, loaded with slugs. Rather than loading the shotgun just with slugs, some prefer .00 buck as the first slugs in the shotgun, since with .00 buck aim is less important, a consideration for an excited shooter. But it is important to remember that with the spreading pattern of .00 buck it is easier to hit something besides your target.

Studies by the U.S. Forest Service have shown, however, that the high-powered rifle is actually the weapon of choice for bear protection.

Any special tips on loading and firing a shotgun using buckshot?

As the National Rifle Association notes, "with a shotgun you 'point' at the target. Because of this, the fundamentals of shotgun shooting are different. Accurate shotgun shooting requires a fast sequence of movements involving the body, gun and eyes. These movements need to be performed in one smooth, coordinated movement for accuracy.

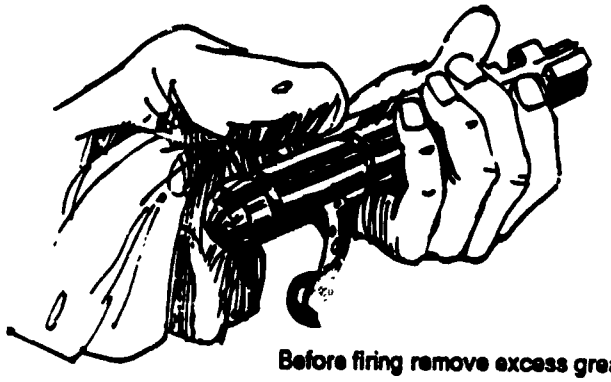
"The shotgun shooting position or 'stance', resembles that of a boxer in the ring–feet spread apart, well balanced, arms and trunk free to swing to the right and the left of the target. This position must be comfortable and natural to allow quick movement in any direction.

"When shooting, the body weight shifts to the leading leg (left leg if you shoot right-handed, right leg if you shoot left-handed). The leading hand holds the shotgun fore-end and points naturally to the target area. You don't the shotgun–you 'point at your target." (Basic Hunter's Guide, p. 189)

What tips should I consider when loading and firing a high-powered rifle?

Remember that a high-powered rifle slug can travel a good distance. Be careful where you aim and shoot the rifle. The proper ammunition should be kept with you in a safe, dry place. If you have any doubts, you shouldn't be shooting. Loading depends on your type of action, but never force ammunition into a gun.

Get some tips from a local pro. If there is no local pro available, find a publication. Practice before you go out with your gun. Using a firearm involves more than just aiming and firing. It involves marksmanship, the ability to hit your mark or target. Aiming can be an involved procedure. Aiming can involve identifying your "master eye", the eye you use for sighting purposes, sight alignment, trigger control, breath control, and follow through. Making sure your sights are adjusted *before* you use the rifle by sighting in the rifle on the range will keep your shots true to mark, and make your shooting safe and efficient.



Before firing remove excess grease and oil.

How should I clean and care for the firearm?

Gun-cleaning kits are available at gun shops and most hardware stores. Always make certain your rifle is unloaded. Remove clip if rifle is of the clip magazine type. If it's the tubular magazine type, check to see that there are no cartridges at the breech end of the tube or on the carrier. Next remove the bolt, which will permit cleaning from the breech end. Be sure you will have newspapers on the floor. Follow the directions listed on the gun cleaning kit.

Make sure your gun is unloaded. Clean the bore through the breech where possible. Clean the barrel and metal parts with a good commercial solvent until the patch comes through clean. Next run an oily patch through the weapon. Lightly coat all metal parts with oil. After cleaning the gun with rod and patches, apply a light coat of oil to the metal parts of the gun. Make sure to use the oil sparingly. Too much oil can clog the gun and prevent the firearm action from working smoothly. Preferably store in a horizontal position. (Basic Hunter's Guide, pp. 181-182)

What should I remember about storing the firearm safely?

Never store the gun loaded. Keep all guns out of reach of children. Make sure the action is open so a person can *see* the gun is not loaded. As the National Rifle Association states, "when the firearm is clean, store the unloaded gun, in a horizontal position, in a locked cabinet. After storage and before you use the gun again, run a clean patch through the bore before firing. Remove all excess grease and oil. Ammunition should also be kept clean. If sand or dirt collects in the bullet lubricant, it can damage the bore of the gun. Firearms owners should always assume that anyone untrained in the use of firearms will not know how to handle them properly. To prevent accidents, always store firearms and ammunition separately in locked storage units." (Basic Hunter's Guide, pp. 181-182)

Boat Operation
Teacher Page

Competency: **Operate a boat**

Tasks:
Include safety equipment aboard boat
Start outboard
Change spark plugs
Prepare gas and oil mix
Operate a boat safely

Introduction

Alaska is boating country. Because highways provide access to only about a third of the state, boating remains an important means of transportation. Most of Alaska's supplies still arrive by boat, and in Southeast Alaska, with few communities connected by roads, boats are still the main means of transporting goods and vehicles. Recreational boating opportunities are nearly everywhere: from rafting in the Chugach Mountains to fishing off Prince of Wales Island.

Overview

Boating in Alaska is an everyday recreational activity. Rafting is becoming increasingly popular, as is kayaking, sailing, and even touring by cruise ship. Hazards in small boats are very real, however, and the state's rate of accidental death and injury in boating accidents is a cause of concern for many. Boating safety needs to be a primary focus of the outdoor recreational boater.

Suggested Learning Activities

1. Visit an outboard mechanic at his/her shop or at a dock where s/he can safely demonstrate the safe use and handling of an outboard motor. Perhaps you can arrange a field trip on the boat to emphasize boat handling as well.
2. Practice cleaning and changing spark plugs on an outboard motor.
3. Practice fueling and starting an outboard motor. What do you do if the engine stalls or floods?
4. View some of the U.S. Coast Guard's excellent videotapes on boating safety. The following titles are especially popular, available by calling the U.S. Coast Guard Boating Safety Office, 586-7467 in Juneau: "Hypothermia," "Sea Survival," "Cold Water Near Drowning," and "Shore Survival."

Resources

Alaska Department of Transportation and Public Facilities, P.O. Box Z, Juneau, AK 99811 *Responsible for providing public floats, grids, docks, launching ramps and associated small boat harbor facilities throughout the coastal areas of the state.*

Boat/U.S. Foundation for Boating Safety, 880 South Pickett Street, Alexandria, VA 22304. *Offers a variety of pamphlets and materials on hypothermia, personal flotation devices (P.F.D.s) and other boating-related topics. Offers a nationwide toll-free number, 800-336-BOAT to provide boaters everywhere with instant access to up-to-date information on boating courses offered in their area.*

U.S. Coast Guard Auxiliary, Chief Director, Commandant (G-NAB), United States Coast Guard, Washington, DC 20593; *for information on Alaskan flotillas:* Director of Auxiliary, 17th Coast Guard District, P.O. Box 3-5000, Juneau, AK 99802-1217. *The "Skipper's Course" is an excellent introductory course for students. Also, ask for the text Boating Skills & Seamanship.*

Vocational Materials Library, Office of Adult and Vocational Education, Alaska Department of Education, Box F, Juneau, AK 99811. **Small Engines and Outboard Marine Mechanics Curriculum**

Pamphlets and Papers (*tables and references*)

"Marine Recreation", U.S. Forest Service. Alaska Region.—[Juneau]: USFS., 1983. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations, map, and references.*

"Marine Recreation in The Tongass National Forest", Elizabeth Evans.—U. of OR: Dept. of Planning , Public Policy and Management, 1983. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau.* Includes tables.

Boat Operation

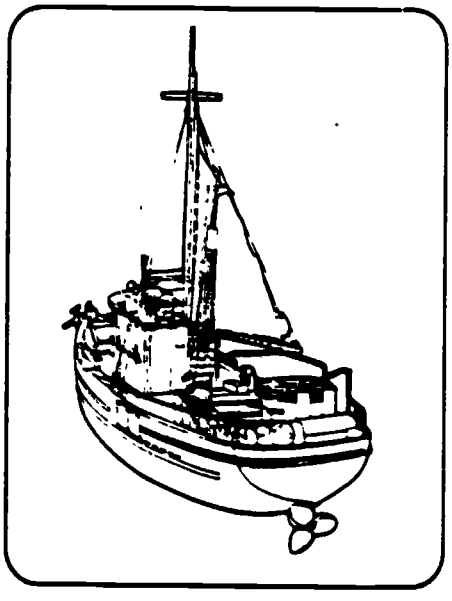
What safety equipment do I need aboard the boat?

Like so much in the field of outdoor recreation, you could be operating a boat under several capacities. You could be the weekend boater, complete with sailor's cap, Coleman cooler, boy or girlfriend and fishing gear. Or you could be the Fish and Wildlife Protection officer, driving a patrol whaler up a salmon river, checking fishing licenses, looking for violations. But both boaters have a lot in common. They share the common adventure, and the common dangers involved in boating.

All boats are required to have lights at night, whether a hand-held light for hand-powered canoes and kayaks and skiffs under 16 feet, to red and green sidelights, masthead lights and sternlights for commercial vessels. You also will need personal flotation devices (P.F.D.s)–life jackets. P.F.D.s come in five types. Federal law requires that recreational boats carry one Coast Guard approved life jacket of the correct size and in good condition for each person aboard the boat. The Coast Guard or Fish and Wildlife Protection offices can inform you of the exact requirements. You also should carry flares or other signalling devices in a waterproof container, a bailing bucket, some hand tools, oars or paddles, a radio (if you have one), an anchor, and survival equipment. For operation in rough waters, you are safest if you carry survival suits. Survival suits are made of neoprene. They cover your entire body including your head. They keep you afloat and will keep you alive in cold water eight hours or more.

Any tricks on getting the outboard started?

Some people feel about outboards about like they do a good dog...you like it, and it likes you. The real test of an outboard, however, is how easily, reliably, and regularly it starts. An outboard that doesn't run is probably one of the most useless pieces of metal you can find. Ask someone stuck 25 miles down the river. Tricks for starting include making sure you have new gas, or gas untainted by water. Cover your gas can when storing. Clean fittings before connecting the gas line. Use the choke the first couple of times you try starting the engine, then try it without the choke. If the engine is still hard-starting, following a trouble-shooting sequence (found in *Intertec* or other service manuals) is in order. You might photocopy a trouble-shooting sequence and keep it in your tool kit to help you keep afloat.



What should I do about spark plugs?

A good place to start. Carry some extra *new* spark plugs of exactly the size you need. You can clean spark plugs, but try doing it in a downpour, or at sea, or at 50 below. If you do clean the plug, first thoroughly degrease it with a nonoily solvent and air-dry. To clean, use an abrasive such as sand paper, though a special abrasive nonconductive to electricity works best. Clean the grounded and insulated electrodes and return them as nearly as possible to original shape by filing with a point file. You can adjust the electrode gap by bending the ground electrode. To avoid all the problems with cleaning ad adjusting plugs while afloat, carry some extra *new* plugs.

And the gas and oil mix?

Most two-stroke cycle engines are lubricated by oil mixed with the fuel. Some service stations offer mix right at the pump. One thing for certain, mixing your oil and gas in a rocking boat is not a good idea. You'll want to mix your gas and oil before you start out. Oil and gasoline can be damaging to wildlife–and people. Keep the gas and oil in the tank, not in the water. Different engines require different mixes. Note the recommended ratios and type of oil for your engine. You can find that ratio in the "Lubrication" section of the manual which comes with the motor. Mix ratios of oil to gasoline for different-sized containers are found on the back of marine oil bottles. Unleaded gasoline such as marine white should be used when possible. A common gas to oil ratio is 50:1.

How about final safety tips?

Alcohol and drugs and boating don't mix. Remember that. Also, life preservers are for wearing, not for sitting on. Remember to have a life preserver for everyone aboard. Having flares and other signalling devices aboard, and abiding by state and federal laws relating to boating is a must. Make sure your skiff or vessel has flotation. If you skiff or other recreational vessel capsizes, stay with the boat. Don't panic, bail the vessel, and try to pull yourself out of the water. If you're in the water, huddle-float and protect your heat-loss areas by grasping your arms around your legs. Keep your clothes on. Signal for help.

Safety Around Aircraft
Teacher Page

Competency: **Work safely around aircraft**

Tasks: Practice safety around aircraft including:

a. boarding helicopters forward of loading doors
b. boarding propeller aircraft from the rear
c. boarding only on pilot's signal
d. wearing seat belt
e. not flying flammables in passenger compartment

Introduction

Many jobs in outdoor recreation in Alaska will involve working around aircraft. The main concern around aircraft is safety. Unfortunately Alaska easily leads the nation in small aircraft fatalities per capita. Special concern for safety around aircraft may help to reduce this dubious distinction.

Overview

We are talking here about the job of being a safe worker around aircraft. Knowledge of aircraft safety and previous experience working around aircraft may help the entry-level person get a job.

Suggested Learning Activities

1. Discuss reasons for storing fuel separately from passengers.
2. Brainstorm hazards of boarding, flying, and disembarking from aircraft.
3 Develop safety rules to follow around aircraft.
4. In the classroom, role play use of safety rules.
5. Invite a pilot to class to discuss safety around aircraft. Slides or a videotape may enhance this discussion.
6. Take a field trip to practice safely boarding, flying in, and disembarking from a small plane or helicopter. Ask the pilot for guidance to assure that everyone is truly safe.

Resources

Alaska Wing-Civil Air Patrol, Public Affairs Officer, P.O. Box 101836, Anchorage, AK 99510

"Satellites on call when planes fall from the sky," by Dean Fosdick, The Associated Press, The Anchorage Times, May 2, 1988.

Survival Kit for Aircraft Personnel, Subject No. File 304, Equipment Development Center, Missoula, Montana, November 1973. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau.*

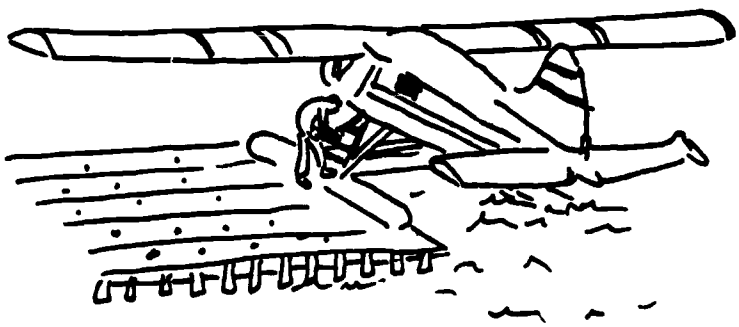
Test Your IQ on the Operation, Care and Maintenance of ELTs/EPIRBs. *Includes passenger check list and saving your life with the emergency transmitter. Request from U.S. Forest Service, Juneau.*

U.S. Forest Service, Tongass National Forest, Ketchikan Area, Federal Building, Ketchikan, AK 99901, Stikine Area, P.O. Box 309, Petersburg, AK 99833, Chatham Area, 204 Siginaka Way, Sitka, AK 99835. *Ask for the "Aviation Go-No-Go Checklist."*

Safety Around Aircraft

What special safety practices should I remember around aircraft?

Prop strike is a real danger around aircraft. Board aircraft only on when the pilot indicates. Wait for his or her signal. Remember to board helicopters forward of the loading doors. The tail rotor on helicopter is a special hazard. Listen to the safety instructions which the pilot is obligated to offer you. If the pilot neglects to offer you those instructions, ask where the Emergency Locater Transmitter (ELT) is located. Ask about life vests, fire extinguisher, ear protection, and about the radios aboard. You must wear a seatbelt. Remember that even though the pilot is responsible for the protection of the passengers, in small aircraft, you have a say. If you don't feel comfortable getting aboard, don't get aboard. Notify your supervisor of safety problems you may note. Remember, flammables are not to be flown in the passenger compartment. Depending on the circumstances, your experience, and policy, indicate special hazards to the pilot. In the air, you might tap the pilot and point if you note another aircraft flying in your vicinity. Take some responsibility for your own safety--and relax. Aircraft, even small aircraft, still counts among the safest ways to travel.



Aircraft today carry "Emergency Locater Transmitters (ELTs). These devices can be turned on when the aircraft has suffered impact. The ELT's signal is picked up by SARSAT-COSPAS satellites and the location of the downed aircraft is relayed to ground stations, which coordinate rescue efforts. The system is credited with saving the lives of over 1,000 people worldwide in the last six years, a quarter of those (237) in Alaska. Studies have shown that if survivors of an air crash are rescued within eight hours, their survival rate is over 50 percent. If rescue is delayed beyond two days, survival chances plunge to less than 10 percent.

As a part of the pre-flight briefing the small aircraft pilot should inform all passengers of the location of safety equipment, including the ELT. The passenger should know how to manually activate the ELT in case it does not engage upon impact.

The U.S. Forest Service offers the following "Go-No-Go Checklist" for employees working around aircraft:

If any one of the following situations is present cancel the trip. If already in flight ask to land until conditions warrant continuing.

1. **Visibility and Ceiling Requirements.**
   AIRPLANE-Two miles visibility and five hundred foot ceiling.
   HELICOPTER- One-half mile visibility and five hundred foot ceiling.

2. **Foggy Weather-** Beware of fog, make certain ceiling and visibility minimums are present and you won't get caught in the fog.
3. **Snow Squalls-** Snow squalls develop very quickly in the spring and fall months. Maintain ceiling and visibility minimums and remember they can detericrate extremely fast.
4. **Wind-**Thirty knots of wind speed are the maximum allowable because of emergency water landing conditions and turbulence.
5. **Mountain Passes-**If passes are partially obscured and appear marginal do not enter them for investiga tion. It may be too late to turn around.
6. **Pilots-**Watch for indications that the pilot's mental or physical condition are not conducive to safe flying, i.e., anger, tiredness, nervousness, or inattention.
7. **Aircraft-**Be concerned if you observe damage, dirt, fuel or oil leaks. Report it to the Aviation Officer.
8. **In Flight Communication-**Make sure radio communications are maintained with dispatcher or FAA.
9. **Loose Cargo and Overloading-**Never overload an aircraft. Make certain the pilot has all cargo secure.
10. **Passenger Briefing-**The pilot must give you a briefing before departure on where the emergency equipment is and how to use it.
11. **Personal Protective Equipment-**You must wear in an inflatable vest with a survival kit in a helicopter over water. Although you don't have to wear them in an airplane they must be made available to you. We strongly urge you to wear them. A flight helmet, fire resistant coveralls, and gloves may be furnished to you to be worn on helicopter flights.
12. **Helicopter Foreman-**A qualified helicopter foreman is required to supervise each helicopter and responsible for your safety around helicopters. ("Aviation Go-No-Go Checklist, U.S. Forest Service Alaska Region)

Selling Books, Film and Curios
Teacher Page

Competency: Sell books, film and curios

Tasks:
Greet the customer
Stock and display merchandise
Display the merchandise
Protect merchandise from breakage and theft
Practice courtesy
Bag items
Carefully key the sale
Take money/make change
Cash out the register
Deposit receipts
Change register tape

Introduction

Though work in the field of outdoor recreation offers the allure of nature, a fact of life is that visitors require services. Many who work in the field of outdoor recreation are surprised that they may spend time selling books, film and curios. These prospective employees need to be prepared for these duties. Visitors pay to come and go but the outdoor recreation attractions are the natural features themselves. Many Alaskans will benefit from this industry through retail sales.

Overview

As the state grows, retail sales will grow. Alaska is host to a galloping tourist economy. Much of the growth in the tourist industry is in the realm of small businesses, souvenir and curio shops. These businesses offer valuable experience to youth, non-polluting industries for local economies, and of course economic security to thousands of Alaskans.

Suggested Learning Activities

1. Invite someone to class who has the job of selling books, film, and curios (preferably, one who works in a visitor center). Ask that person to tell you about his/her responsibilities on the job.
2. Role-play a salesperson and a tired and cranky visitor who needs help finding merchandise in a certain price range. The salesperson needs to practice courtesy and patience in spite of the demands of the visitor. Use play money to practice counting out change.
3. Work for a short period of time in your school store or other facility where you can practice serving people, stocking merchandise, and working with money. Practice changing the tape on the machine and writing out receipts and credit card charge slips, if possible. Perhaps you can set up a small store as a class project.

Resources

Vocational Materials Library, Office of Adult and Vocational Education, Alaska Department of Education, Box F, Juneau, AK 99811. **Marketing Curriculum.** *This curriculum offers a number of resources in the marketing field.*

Selling Books, Film and Curios

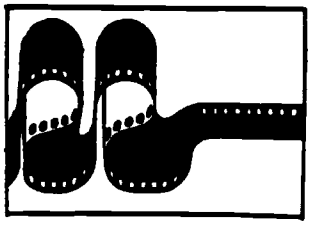
How should I greet the customer?

Friendliness goes a long way to success in business. One aspect of the outdoor recreation industry is selling books, film and curios. Formality works best with visitors. Be at your best. The visitor may be assessing both you and your community. Your friendly greeting initiates that assessment.

How do I stock merchandise?

Companies and supervisors have set policies for merchandise stocking. Systems for stocking, re-stocking, inventory and other incidentals of a business vary. Techniques learned in marketing and business classes and DECA will contribute to your skills in retail sales.

Stocking merchandise involves placing merchandise in the proper location. Those in retail carefully place materials for maximum profile. Stocking involves cleaning and dusting the merchandise, and merchandise rotation. Rotation involves, for products with a definite *shelf life*, moving the oldest products to the front, so as to insure freshness. Care must be taken when handling merchandise; breakage can reduce profits.



How should I display items?

With so many of these areas, your supervisor or someone else more experienced than yourself will be already considering such things as display. Display is when goods or services are portrayed in a window or other location to inform the customer and encourage him/her to buy. Displays for the outdoor recreation customer should, of course, appeal to that customer. Your displays should be current, attractive, neat, informative and appealing to someone interested in buying. Take some time with display. Ask your supervisor for help. If you're lucky enough to be the one assembling the display, take some time to imagine the type of information and arrangement which would appeal to you, if you were the customer. Take a look at other displays around town for marketing ideas.

How can I help protect merchandise from breakage and theft?

Selling film, books and curios is the retail portion of outdoor recreation. Many who envision their work in outdoor recreation are disappointed when they have to spend some time behind the counter. But often that work behind the counter allows the employee to work in a special natural setting. Additionally, having an official at a central location ready to provide information and assist visitors contributes greatly to a visitor's experience.

One unfortunate area of retail is the problem of breakage and theft. Shoplifting is a fact of life. Supervisors and store owners are well aware of the tremendous losses they can incur. Employees must be ever diligent for objects dropped into oversize handbags, tucked into coats, or carried out without being paid for. To minimize breakage, have a sample product on display. This may satisfy curiosity and protect the unopened product. Special tricks

such as securing the product with a cable or gluing your sample object to a display board may protect items and offer some means for the customer to touch and feel what they are interested in buying. Items that disappear often should be moved closer to the cash register. Adequate lighting will help reduce theft–avoid dark corners. Follow company policy or the advice of your supervisor regarding breakage and theft.

What about putting souvenirs in a bag?

Don't put the heavy things on top. Remember that bags are usually carried by the bottom. Heavy things on top can crush those below. Most delicate products come from the manufacturer in protective packaging. Utilize the protective packaging provided. Remember that many visitors are far from home, are checking their bags, and may not have a secure place to pack their items. Many businesses serving the outdoor recreation visitor will ship souvenirs or other purchases for the visitor. Check to see if your company or agency has a mail order catalog. This service allows the visitor to continue their trip unencumbered. Many businesses have an established policy for such shipping. When packing those goods, or when packing gifts and curios which the visitor carries at the time, pack for rough handling. As anyone who has traveled can testify, glass seems to find miraculous ways to break, tapestries to tear, and foodstuffs to ooze in the most inconvenient corners of suitcases, handbags and knapsacks.

How do I key the sale?

Cash registers have changed in recent years. Some registers involve keying the item number as well as prices, some have a single key for each item and will compute the prices and the tax themselves. Each type of register will have its own system. Of course operating the register is an important part of any business, and as such, your employer will train you. Though many systems are highly automated today, you still need to be attentive and precise. Careful attention to your work station, careful organization of the cash drawer, making sure you hit the keys correctly, and counting change may be most important skills related to keying the sale.

How do I handle money and make change?

Procedures for handling money vary from place to place. Always call out the price for each item sold as you ring it up on the cash register or calculator. Be sure the numbers on the machine are clearly visible as well. Let the customer know the total of the bill in a clear voice. Place the bill the customer gives you on the shelf of the register. State the amount of the sale then say the amount the customer gave you. For example, "That's fourteen fifty-nine out of twenty." Count from the amount to larger denominations, to the amount the customer gave you. To give change for fourteen fifty-nine, you give a penny, dime, nickel, quarter, and a five. You'd say "one cent makes sixty, ten makes seventy, five seventy-five, a quarter fifteen dollars, and five makes twenty. Thank you very much." Count the money right into the customer's hand, in plain view, beginning with the pennies, then the nickels, dimes, quarters, and finally, the bills. Not only will the customer feel better about getting the proper change, you'll have another set of eyes to help make sure you counted correctly. Always make change working from the smallest value of coin to the next smallest...all the way up to the largest bill.

Making change is easiest when your cash register allows you to punch in the amount paid and automatically displays how much change you must return to the customer. If your machine doesn't allow that, however, you'll need to count out change to customers.

What is involved in cashing out the register?

Different operations have different procedures. In some businesses employees cash out at the end of each shift. The precision with which you count change is being tested every day. In other operations someone on another shift may cash out the register. In such a case, your precision in counting back change to customers is also under scrutiny. For the business, losses uncovered in cashing out may take a number of sales to cover. Be precise when cashing out. Again, businesses have set procedures. Careful counting, wrapping stacks of bills and putting

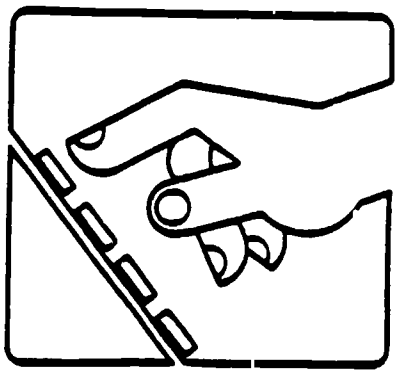
change in sleeves will help you balance the cash you've received. Carefully record cash over or under the register receipt. Report any discrepancies to your supervisor according to procedures of the business.

How about depositing receipts?

Depositing receipts means taking the money to the bank. When you work in a business, no matter how effectively you work on the job, no matter how good a job you do, if the money doesn't make it to the bank, you have accomplished nothing. Some in business vary their routine of making deposits, not always taking the money to the bank in the same way, at the same time. Some place the money in a safe for the evening, and make their deposit in the morning. Banks require that a deposit slip be filled out with the deposit. The information regarding the deposit needs to be properly recorded in the company books.

How do I change the register tape?

Today's registers vary widely. Replacing tape in traditional registers was a common procedure. Register tapes offer a record of the procedure both for the customer and for the business. Though some registers today record the transactions electronically, a copy of the transaction is still made for the customer. Follow manufacturer's procedures for tape change.



Work Outdoors

Backpacking
Teacher Page

Competency: **Backpack**

Tasks:
Identify attributes of quality backpacking gear
Pack wool, polypropolene, or pile fiber clothing
Select proper footwear
Practice low-impact camping
Pack out all refuse

Introduction

The ability to pack into remote areas is a skill especially important to outdoor recreation employment in Alaska. The employee may lead visitors to remote sites, may patrol remote sites for safety or law enforcement purposes, or may visit a remote area for personal recreation. Some areas in Alaska offer outstanding hiking, others don't. The state has some excellent maintained trails: the 33-mile Chilkoot Trail out of Skagway, the 27-mile Pinnell Mountain National Recreation Trail, located between Mileposts 86 and 107 on the Steese Highway and the White Mountains Summer Trail on Mile 28 on the Elliot Highway. The state also boasts numerous maintained local trails, unmaintained historic trails, jeep trails, dog sled trails. But the gridwork of maintained trails in parks and recreation areas, like those found in the Lower 48, are not the mainstay here. Sometimes part of Alaska's recreation challenge is to maintain your way without the benefit of a trail. In this regard, the outdoor recreation employee should be prepared for a variety of conditions, and be able to use orienteering skills.

Overview

Entry-level jobs as backpacking guides are available. Though the job may not be lucrative in itself, it exposes the employee to the job as outfitter and of course has the reward of being able to work in the outdoors. The back of Alaska Magazine, *The Vacation Planner*, and the newspaper in the various cities, all offer addresses of backpacking guides and outfitters. Though the idea of hiking guide perhaps is a little more of a European idea, the American culture is changing. Alaska's outfitting industry has hiking and backpacking guides, some of the jobs for federal and state agencies ask about hiking skills and many retail establishments selling hiking gear act as information centers for many hikers. Indeed hiking as a sport is growing in popularity.

Suggested Learning Activities

1. Invite a guide or ranger into your class who has experience hiking and backpacking. Ask him or her to talk with you about clothing, footwear, packs, tents, sleeping bags, cooking gear, and food that would be appropriate for local conditions.
2. Take several day hikes, then go all out for an overnight backpacking trip. In advance of each trip, plan food together and draw up a checklist of necessary gear, referring to notes from the guest speaker's earlier presentation. When you return, evaluate your preparation. Did you have enough gear, of the right kind? Did you carry too much? What would you do differently the next time around? Take notes so that you'll remember.
3. Create a colorful, neatly labelled poster describing how to prepare for trips into the back country.

Resources

A variety of guidebooks on various outdoor settings in Alaska are available, from trail guides to national forests, to USGS topographical maps. Local bookstores and outfitters can assist.

Alaska Division of Tourism, P.O. Box DE-101, Juneau, Alaska 99811 *The "Vacation Planner"* pages *and pages of addresses of outfitters and backpacking companies.*

Alaska Public Lands Information Centers, 605 West 4th Avenue, Suite 105, Anchorage, AK 99501; 250 Cushman Street, Suite 1A, Fairbanks, AK 99701; and P.O. Box 359, Tok, AK 99780

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001 *Ask for the brochure **Alaska State Parks.***

Alaska Wilderness Guides Association, 141061, Anchorage, AK 99514 *This organization offers certification for backpacking guides in the state.*

American Hiking Society, 1015 31st St., N.W., Washington, DC 20007. (703) 385-3252. *Non-profit organization interested in maintenance and construction of trails for hikers. Supports voluntar t in general, especially citizen participation in care of natural resources.*

Bureau of Land Management 701 C Street, Box 13, Anchorage, AK 99513

Books and Pamphlets:

The Alaska Wilderness Milep... Alaska Northwest Publishing Company, 130 2nd Ave. S., Edmonds, WA 98020. *This annual publication offers a wealth of local "milepost" information, lore, and other travel tips for Alaska visitors.*

Complete Guide To Hiking And Backpacking , Edited By Andrew J Carra , New York Winchester Press C1977.

Complete Walker, The Joys And Techniques Of Hiking And Backpacking , Colin Fletcher Illustrations, 3rd Ed Rev Enl And Updated, New York Knopf Distributed By Random House, 1984.

Hikers Bible , 1st Ed, Elman Robert, Garden City, N Y, Doubleday 1973.

Hiking Light , by Marlyn S Doan, Seattle Mountaineers,1982 .

"Hiking Safety," by Dave Rittenhouse, Alaska Fish & Game Magazine, September-October, 1986, pp. 15-17.

"Minimum Impact Camping," *Pamphlet. Available from Recreational Equipment Incorporated (REI), P.O. Box C-88126, Seattle, WA 98188.*

"No Trace Camping," *Pamphlet. Available from the Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513.*

Movin On Equipment And Techniques For Winter Hikers, By Harry Roberts, Boston Stone Wall Press, 1977.

Orienteering , by B. M. Henley, Wakefield : Ep Publishing [for] The Scottish Orienteering, Association, 1976.

Orienteering, by John Disley, Illustrated By Gordon Mansell, Stackpole Books, Harrisburg Pa , 1977, 1973.

Solo Survival , Moreland Latchford Productions Toronto,1973 . Format — Audio-visual.

Walking In The Wild The Complete Guide To Hiking And Backpacking By Robert J Kelsey , Funk Wagnalls, New York, 1973.

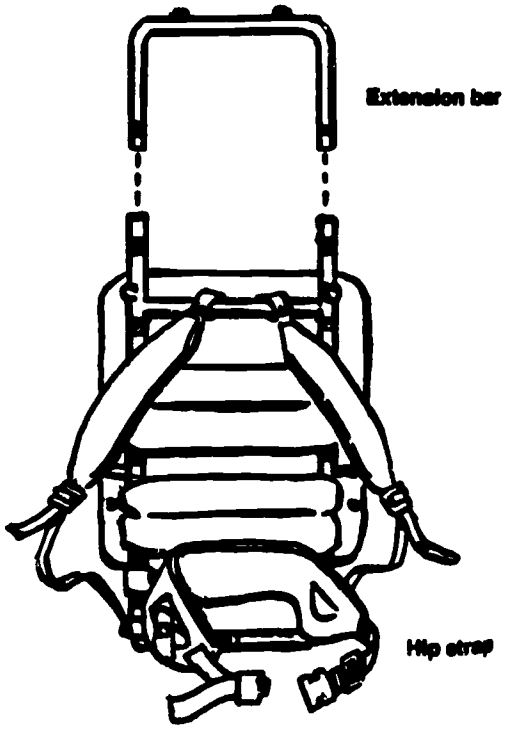
Weathering The Wilderness. The Sierra Club Guide To Practical Meteorology, William E Reifsnyder, San Francisco Sierra Club Books,1980.

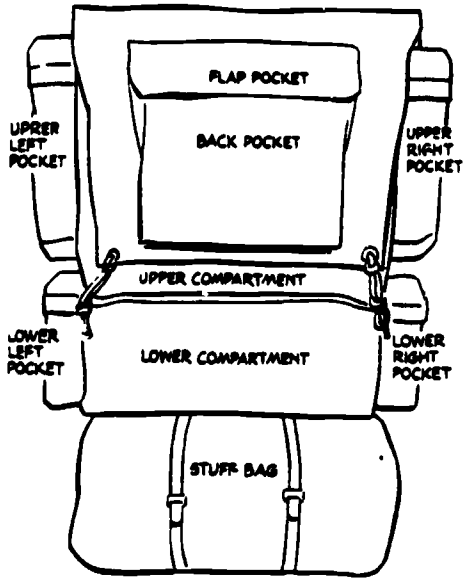
Wintering The Outdoor Book For Cold Weather Ventures, by Russ Mohney Illustrated By Karel Hayes , Mohney Russ, Harrisburg Pa Stackpole Books , 1976 .

Backpacking and Hiking

Do I need to have good backpacking gear?

Talk to someone who took an extended trip with less than good backpacking gear; they'll tell you that your primary equipment–pack, tent, and sleeping bag–should be of quality materials and construction. Though the novice might think that the quality of these items doesn't matter, nothing could be further from the truth. A good backpack will comfortably carry both personal and group gear, protecting the gear from rain, wind, sun and brush. The largest pack you can comfortably carry works best. A large empty pack doesn't weigh a lot more than a small empty one, but the large one has more uses. You may need to carry survival gear someone else can't manage. You may find something on the trail. A large backpack has a double function as travel luggage. Backpacks usually have some sort of frame that distributes the load on your back. Some frames are external, some internal. Occasionally large packs may be designed to distribute weight without any sort of perceivable frame. Specialty backpacking and other sports stores can assist in selecting quality gear. Military surplus gear, though often of rugged construction, is not necessarily designed for comfort and may not be satisfactory.





What are some materials for backpacking clothing?

Wool, polypropolene, or pile fiber clothing will keep you warmer than cotton and many other materials when wet. A good collection of stuff sacks, each a different color, of water-resistant nylon will help you organize your gear inside your backpack. Alaskan weather can be warm in the summer, so light clothing is in order as well. You need one of everything–a good wool sweater or pile jacket, light wool or polypropolene underwear, wool pants for cool weather, light synthetic pants for warmer weather, wool hat, wool gloves, extra wool socks, and rain/wind gear. Remember sun glasses–and sun screen lotion, and a little extra clothing just in case of emergencies.

The right kind of clothing in Alaska usually means being prepared for the unexpected. Probably no place else in the United States can have such variations in temperature. Experienced Alaskan hikers, even if they go out wearing shorts and a T-shirt, will carry a backpack with rain gear, pile pants or wool, a pile jacket or wool sweater, possibly polypropelene or wool underwear, wool hat and gloves. A light long sleeve shirt won't be too hot and will offer some protection from insects and sun.

When you're hiking, it's a good idea to carry the following, even on a day hike:

- extra clothing and food
- waterproof matches
- fire starter (candle)
- first aid kit
- insect repellant
- rain gear, rubber boots
- map, compass
- knife, flashlight
- space blanket, shelter
- flares, whistle, signal mirror

If possible, carry safe drinking water with you. Surface water must be boiled for five minutes before drinking; chemicals are not as reliable as heat in killing giardia, a microscopic organism transmitted between humans and animals. Even clear water may be contaminated. ("Hiking Safety, p. 15)

What footwear is best for backpacking?

It depends on where you're going. Rainy, muddy places in the state require rubber footwear–*Ketchikan sneakers*. Other places are dry and rugged, so you might take good track shoes or other nylon footwear. Whatever you take, make sure your boots fit and are broken in. Hard leather boots can wear skin raw. Remember, when you're in the back country, your only way out may be your own feet!

Like much in the field of outdoor recreation, footwear has been affected by technology. Where heavy leather boots may have been the footwear of choice in the past for hiking trips, and indeed such footwear has served many a hiker well, today's lightweight water-resistant footwear have the advantage of low price, quick drying, and they often don't need to be broken in. One back country ranger in the Brooks Range worked an entire summer wearing a pair of inexpensive nylon hiking sneakers. It must be noted that if you are walking on sharp rocks or are mountaineering, a more traditional mountain boot–or even a modern plastic mountaineering boot– may be in order. More than one hiking trip has been ruined by new boots. Break in your boots before starting out, and remember that moleskin, adhesive tape, and Bandaids are an important precaution for any hiking trip.

What is meant by low-impact camping?

"Take only pictures, leave only footprints." The standard for low-impact camping is to leave the area looking as if no one had been there. That means all your refuse, all your food scraps, all other debris or refuse needs to go out the way it came in–on your back, in your boat, in your car, or on your airplane. Too many Alaskans take their pristine out-of-doors for granted. Low impact camping means you're nature's guest and you treat it with respect. Many recreational campers today do their cooking over lightweight backpacking stoves. These stoves use efficient gas or bottled gas, are easy to carry, clean-burning and allow for quick meal preparation. These stoves are available at any backpacking or camping store. Wood fires, while traditional, can cause forest fires, can leave ugly scars, and require a lot of effort to maintain. If you do choose to have a campfire, try to use a fire ring which has been used before. If none is available, construct one in a place where it will not mar the ground, below the high tide on the coast, on a lake or river beach, in a metal fire pan, or on solid rock. Then, after you put the fire out, you can easily spread the ashes and fire ring rocks out, so to leave no trace for other campers.

An Alaskan backpacking guide relates:

"The notion of biodegradable has been the scourge of the backcountry since the late sixties. How many times have I run across apple cores, orange and banana peels left there by some hiker who thought that these items were not trash or litter but that they would just 'naturally' be consumed by the earth...in time. So will a junked car! Thinking of such items as 'biodegradable' has allowed us to retain our throwaway habit in a very subtle form. A good phrase for the recreational user would be 'if you can't eat it, carry it out."

Cross-Country Skiing
Teacher Page

Competency: Cross-country ski

Tasks:
Wear proper clothing for skiing
Wax skis
Ski with proper technique
Identify avalanche hazards

Introduction

A sport of increasing popularity and focus is cross-country skiing. Modern improvements in gear and clothing have opened up wide areas of Alaska's back country to greater numbers of recreational users every year. Fairbanks and Anchorage maintain tracked cross-country trails in city parks. Hundreds of skiers take to these areas and others every winter weekend.

Overview

Jobs in outdoor recreation related to cross-country skiing might include the obvious and the not-so-obvious. Obvious jobs include those of cross-country ski instructor or coach. More jobs in that area exist than one may imagine. The tourist industry in Alaska is wide open in the winter, with limited visitation. Cross-country ski instruction is offered at ski areas in Anchorage, Juneau and Fairbanks, with additional outfitting and instruction offered privately and at lodges. Growth in winter tourism would provide additional openings. Other less direct jobs include Park Ranger or Fish and Wildlife Protection Officer or other jobs which require visitation of winter sites. Use of cross-country skiing on the job in those fields, however may vary. One thing is certain, the skill is fun and can only add to employability and life skills. Other employment related to cross-country skiing is of course sales and service of gear and equipment. A number of retail stores throughout the state sell state-of-the art equipment. Knowledge of the sport and equipment needed is more than useful in that type of employment.

Suggested Learning Activities

(See activities described in the Wildlife instructional materials.)

Resources

The Alaska Mountain Safety Center, Inc., 9140 Brewster's Drive, Anchorage, AK 99516. (907) 276-3550. *Provides public education programs, preparation of educational materials, research and data collection, especially related to avalanches.*

Books:

Avalanche Handbook, U.S. Department of Agriculture, U.S. Forest Service, July, 1976. *Unsurpassed in its thorough discussion of avalanche and its dangers.*

Citizen Racing, John Caldwell and Michael Brady, Mountaineers, Seattle,1982.

Complete Ski Cross Country The New Handbook For Touring And Racing, by Michael Brady, Dial Press, New York,1982.

The Cross-Country Ski Book, by Johnny Caldwell, S. Greene Press, Brattleboro, Vt., , 1964.

Cross-Country Ski Gear, by Michael Brady, Mountaineers, Seattle, 1979.

The Cross-Country Skier's Handbook, by Samuel P. Osborne, in cooperation with the United States Ski Association, photographs by David Brownell.

"Cross Country Ski Magazine," Times Mirror Magazines, New York, N.Y.

Leadership and Administration of Outdoor Pursuits, Phyllis Ford and James Blanchard, 1985, Venture Publishing, Inc. 1640 Oxford Circle, State College, PA 16803. *Excellent text. Appendix discusses various areas of outdoor recreation.*

Mountain Skiing, by Vic Bein, The Mountaineers, Seattle, WA, 1982.

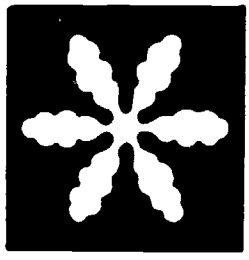
Nordic Touring And Cross Country Skiing, 5th Rev Ed, by Michael Brady, Dreyer, Oslo 1979.

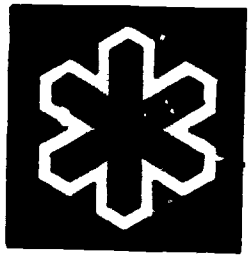
Ski Cross Country From Touring To Racing An Authoritative Up To Date Handbook, by M. Michael Brady and Lorns O Skjemstad, Dial Press, New York 1974.

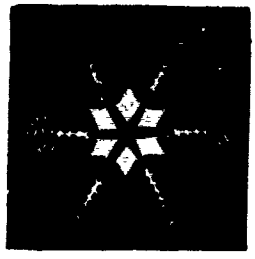
Skiing Alaska's Back Forty, Glacier House Publications, 1988. *A collection of over 40 back country nordic ski trips. Available at sporting goods stores in Anchorage or from Glacier House Publications, Anchorage.*

The Snowy Torrents, Knox Williams, Teton Bookshop Publishing Company, Box 1903, Jackson, Wyoming 83001. *An excellent series of reports depicting backcountry avalanche mishaps and misfortunes. Written with a perspective to alert readers to the various dangers of backcountry winter use.*

Waxing For Cross Country Skiing, 5th Rev Ed, by M Michael Brady and Lorns O Skjemstad With Photos By Frits Solvang and drawings By Odd R Petterson, Wilderness Press, Berkeley Calif 1979.







Cross-Country Skiing

What is the proper clothing for skiing?

Cross-country skiing is a lot of work. Though it may be excruciatingly cold outside, your body can generate a lot of heat. You can burn a lot of calories. If you go out with heavy clothing on, you'll be taking clothes off. Light, warm fabrics, especially some of the synthetics such as polypropelene or pile, or wool, will offer quite a bit of warmth without being too heavy in weight. Plus, these fabrics maintain some warmth when wet. You can generate a sweat when cross-country skiing; the fabric should breathe. So, even though you may ski in warm light clothing, you won't ski all day; you'll need to carry warm clothing with you for when you stop. You can cool down quickly and working up a sweat may leave your clothing wet. Also, you'll need the basic gear for survival if you are skiing in a remote setting. Sunglasses, dark tint with full coverage, secured with straps, are a necessity. You'll need windproof clothing, gloves, a wool hat, and *gaiters*, which keep snow out of your boots.

How do you wax skis?

The question might be better asked if it's better to have waxable skis or not. Cross-country skiing is a sport evolving rapidly technologically. While waxable skis work great for temperatures below 25 degrees F., getting the wax right for temperatures above 25° is tricky. Manufacturers have a number of waxes for varying snow temperatures and conditions. Local and individual experience will dictate what is best. No-wax skis are probably best for beginners and for those who live in warmer climes such as Southeast Alaska, where the snow is often wet and sticky.

What do I need to know about proper skiing technique?

For any extended recreation trip, you'll need to be an accomplished nordic skier. Deep in the back country is no place to be discovering that your technique just isn't good enough. The place to practice is close to home or at a ski area. Some city parks or ski areas in the state establish cross-country ski trails. Many of these ski trails are tracked for easy skiing. Those are the places to learn basic techniques such as tip paddle turns, tail paddle turns, sidesteps, kick turns, tail crossover turns, falling, getting up, walking, basic diagonal, double poling, one-step, uphill stride, herringbone, straight running, step turn, single plow, snow plow, snowplow turn, traverse, stem turn, telemark bumps, or basic telemark turns. Many areas offer ski lessons, with expert cross-country skiers teaching beginning, intermediate, or advanced classes. If you live in a rural area away from such organized activities, you can learn from others, or can obtain excellent books on the subject.

Are there hazards from avalanches?

It depends on where you are. Many mountainous areas of the state are avalanche country. Avalanches are caused by a buildup of snow on steep slopes, which, when disturbed, or spontaneously, slides down the mountain. Those familiar with the avalanche hazard specifically note the conditions which can lead to avalanche and the slopes on which avalanches can develop. Some prepare for avalanches by carrying small battery-powered avalanche transceivers thaat help them to be located under snow. They may carry shovels and long poles for locating victims. Such skiers may spread out in hazardous country to minimize hazards. The sure way to avoid hazards from avalanche is to stay away from places where avalanches occur when conditions are dangerous. The U.S. Weather Service includes information about avalanche danger as pertinent weather information.

Temporary Camps
Teacher Page

Competency: **Construct temporary camps**

Tasks:
Build a tent platform
Erect tent
Minimize human impact
Install outhouse

Introduction

Erecting and maintaining temporary camps is very much a part of the outdoor recreation industry in Alaska. Rangers live in field stations, those who maintain trails live in temporary camps. Temporary camps provide housing where none exists.

Overview

For those working in the outdoor recreation field, those conducting field work may be responsible for constructing temporary camps or professional maintenance and construction workers may responsible for completing these camps. Whatever the case, some knowledge of selecting sites, constructing camps, and minimizing impacts is very important for some employees.

Suggested Learning Activities

1. Visit a temporary camp to get a look at wall tents, tent platforms, cooking areas, and outhouses. Ask residents to explain to you how they set up their camp.
2. Invite a resident of a temporary camp to class to show slides of the steps involved in setting up the camp.
3. Find a local camp that needs work. Build an outhouse and dig an outhouse pit there.
4. Build a tent platform and set up a tent on it.
5. Build a table and counters for cooking and food storage. Erect a tarp over the entire dining area.

Resources

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

U.S. Forest Service, P.O. Box 21628-PAO, Juneau, AK 99802-1628

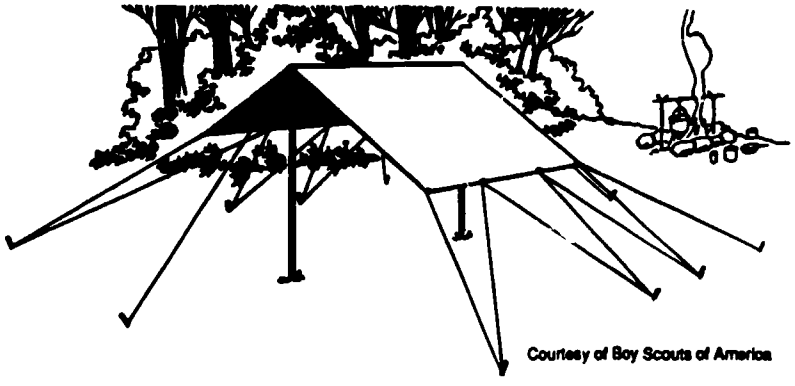
Temporary Camps

How do I build a tent platform?

Temporary camps come in a variety of types and sizes, of course. There are a variety of temporary camps, and in rural areas in Alaska, you might live in a number of them. A backpacking tent is of course a temporary camp. Those who backpack for fun will be familiar with that style of living if they are required to backpack as part of their job. Another, perhaps more comfortable way of living in a remote back country site is in a tent platform. A tent platform is a wall tent erected on a platform. The platform serves to keep you up off the ground, so you don't make a muddy mess of the ground in your living area. Tent platforms are usually built of plywood and 2 x 4s or 2 x 6s. Some are portable, built in sections for easy transportability in aircraft. Tent platform living can be quite comfortable in the Alaskan bush, especially if the tent is equipped with a heater. Plans for tent platforms can be obtained from the Bureau of Land Management.

Any tips on erecting the tent?

Wall tents are standard for working at remote sites. Wall tents are usually made of canvas and are erected on a frame. The frame might be a commercial one or made of 2 x 4s. The frame keeps you from having to secure the tent with guy ropes and stakes and keeps the tent taught, even in wind. A tent can be specially reinforced by securing the frame with guy ropes tied to the frame, passed through grommets in the frame and secured to stakes driven deeply in the ground. Erect the tent by spreading the canvas over the frame. You may have to stand on a crate or ladder to reach high enough. It must be remembered that despite the fact that canvas is tough, it must be carefully handled. A stove jack of metal can be placed in the wall of the tent for an oil or wood stove, though many users today use kerosene heaters. When using any heating device, whether it has a flame or not, strictly follow the stove manufacturer's recommendations. Fire is a hazard in tents, as is asphyxiation from stove fumes.



Courtesy of Boy Scouts of America

How do I keep from impacting the resource?

Minimizing human impact is somewhat difficult. Though building an outhouse involves another structure, it will concentrate human wastes in one site. Believe it or not, in some areas in the Lower 48 rafting groups must carry out their human waste in plastic bags! Other helpful things to do include carrying out refuse that can't be burned, keeping worn paths to a minimum, hardening paths or laying planks when necessary, not feeding wildlife, and bearproofing food storage. Those with good outdoor ethics erect their temporary camps out of sight of other groups, so as to not intrude on those who want to "get away from it all."

How do you build an outhouse?

Human dignity and just plain sanitation require proper sanitary facilities. You can have the traditional outhouse, a little house with a hinged door, a pre-made one of the porta-potty type, or you can make your own. An outhouse is more pleasing visually, and is a little more comforting to the the visitor. You can get outhouse plans from the U.S. Forest Service.

How do you build a cook area?

Though winter campers can cook in their cook tent, it's not a good idea to cook near where you sleep. Bears are attracted to food smells. Cook areas for temporary camps are situated a distance from sleeping quarters. The cook area may be tarp-covered or a tent frame itself. Food smells must be kept to a minimum by burning garbage and refuse (a burn barrel is good for this purpose), and by washing food spills off of table, stove, and/or platform. Keep foods in bear-proof barrels or stored at least ten feet off the ground.

Understanding the Outdoors

Managing Flora and Fauna
Teacher Page

Competency: **Manage flora and fauna**

Tasks:
List plant communities and dominant species within a selected park
Identify native plant species of a selected area or park
Identify plant species toxic to animals and humans
Describe interactions between living and non-living components of an ecological system
Plan and monitor a controlled burn

Introduction

Some jobs in outdoor recreation involve the direct management of flora and fauna. For example, those who manage botanical gardens or zoos for recreational purposes are involved in direct management. Others may be somewhat involved in the management of one or both. For example, some managers are in charge of city parks which have gardens and some wildlife. Those involved in larger recreation areas such as state and national parks or wildlife areas or Bureau of Land Management areas often are directly involved in the management of flora and fauna. Fauna and flora research for such large recreation areas might involve universities or scientists working directly for parks or wildlife units, but managers need more than basic knowledge of the resources they manage.

Overview

The job of managing flora and fauna in outdoor recreation areas might fall under several types. Since most of the major recreational settings in the state are under the jurisdiction of the government, those jobs are usually, but not always, government jobs. Recreational jobs in outdoor settings are usually government jobs, but the job of land manager parallels management jobs for other organizations. Native organizations manage large land areas. In Alaska the job of land manager becomes more defined every day. That job usually requires education in planning.

Suggested Learning Activities

1. Invite an expert to class to show slides and to discuss local plant communities and dominant species. Ask him/her about past training, experiences in the field.
2. Take a field trip with an expert who can identify local plants, especially edible and poisonous ones. Use plant keys and guides. Take samples of each different species (1 specimen of each species) to preserve in a plant press. Later, mount your specimens on herbarium paper and compile into a booklet to share with others. Be sure to label your specimens with the name of the plant, the location, and date, and your name. Collect edibles and prepare a meal.
3. Shoot color photographs or cut out magazine photos of poisonous plants. Mount them neatly on a poster that cautions visitors against eating or handling these plants. Be sure all photos are labelled with the name of the species and with the kind of habitat or location where the plant may be found.
4. Draw a diagram illustrating the relationships between living and non-living parts of an ecological system.
5. Research the idea that large animals tend to originate in areas with colder climates because their heat loss is not so great due to their ratio of surface area to body size. What is your opinion of this theory? Write a paper supporting your opinion.
6. Research controlled burns as a habitat improvement tool. What are the pros and cons of this technique? Write a paper discussion it or participate in a debate about it.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" materials offer a wealth of activities concerning Flora and Fauna For "Project Wild" contact Project Wild Coordinator.*

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

The Student Conservation Association, P.O. Box 550, Charlestown, NH 03603 (603) 826-5206. *This agency manages volunteers in national parks, forests, refuges, on BLM lands, in state park and wildlife agencies, and private natural resource agencies.*

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, P.O. Box 21628, Juneau, AK 99802-1628

Books and References:

Alaska Trees and Shrubs, Leslie Viereck and Elbert Little, U.S. Forest Service, U.S.D.A., Agriculture Handbook No. 410. *Available from Forest Service offices.*

Flora of Alaska and the Neighboring Territories, Eric Hulten, Stanford University Press, 1968. *The Authoritative guide to the flora of Alaska.*

Modern Biology, Otto and Towle, Holt, Rinehart and Winston. 1985.

Plant Lore of an Alaskan Island, Frances Kelso Graham and the Ouzinkie Botanical Society, Alaska Northwest Publishing Company, 137 East Seventh Avenue, Anchorage, AK 99501

Tree Hazards, David W. Johnson, U.S. Department of Agriculture, Publication No. 1-81-8-81, Forest Pest Management, State and Private Forestry, Rocky Mountain Region, USDA, Forest Service, 11177 W. 8th Avenue, Lakewood, Colorado 80225, 1981. *Or, available through U.S. Forest Service, Forestry Sciences Lab., Juneau.*

"Thinning And Scenic Attractiveness Secondgrowth Forests", Brian Kenner, Stephen McCool, : a preliminary assessment —Missoula : University of Montana. Montana. Montana Forest and Conservation Experiment Station, 1985. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations, tables, and references.*

Wild Edible and Poisonous Plants of Alaska, Christine Heller, Cooperative Extension Service, University of Alaska, 1981

Films:

"Alaskan Ecosystems," Office of Instructional Delivery and Support, Alaska Department of Education, Pouch F, Juneau, AK 99811 *A recently-completed video series concerning ecological communities throughout Alaska: $15.00 + 10% for video tapes and $4.00 for teachers guides. Also available through the state film library.*

Managing Flora and Fauna

How can I list the plant communities and dominant species within a selected park?

Many books give an overview to the defined plant communities and dominant species for various places in Alaska. Such plant communities include intertidal areas, seashores, spruce-hemlock forest, spruce-birch forests, wet and dry tundra. Plant keys and simple plant guides to given areas in Alaska are available. Many such books give an overview to the various plant communities. The better-known guides are available at virtually any public library in the state, and are widely seen in bookstores in major cities. *(See the "Knowing Wild Plants" unit of the "Wildlife" instructional materials.)*

How do I know the native plant species of a selected area or park?

It takes time to get to know the native plant species of an area. Many jobs, especially those in natural history or interpretation involve being able to identify native plants. A number of good keys to the flora of Alaska are available. Plant guides and keys are not always the easiest ways to identify plants, however. The best way to identify plants is to have someone knowledgeable identify them for you, or to take a class.

What are some Alaska plant species toxic to animals and humans?

The Cooperative Extension Service lists as poisonous plants baneberry (also called snakeberry), poison water hemlock, wild sweetpea, nootka lupine, vetch or locoweed, false hellebore, and death camas. Of course the only sure way to avoid these plants is to not eat any wild edibles. A better way, however, is to identify them in the wild and get to know them. At least one of the plants, poison water hemlock, can be confused with wild celery, so special care must be taken before ingesting any such wild plants or (especially) suggesting them to visitors.

What are some of the interactions between living and non-living components of an ecological system?

A virus has both living and nonliving qualities. Plants use the sun's energy to make complex chemical substances called foods. Plants and animals respond to nonliving changes in the environment such as changes in the climate. Living things may adapt to nonliving conditions. For example, a theory exists that large mammals in Alaska are large in size because the ratio of surface area to body size drops as the animal gets bigger. A bigger animal thus can adapt to the cold better than a smaller animal. An individual plant or animal does not adapt to fit its environment or change in order to survive. The species to which an individual belongs may adapt, through time, to a changing environment.

Do they use controlled burns in Alaska?

Controlled burning is where brush or forest fires are *intentionally* set in order to improve habitat or to control underbrush or certain plant species. Southeast Alaska, with its very wet climate, is too moist for much controlled burning. Some controlled burning has taken place in the Kenai National Wildlife Refuge and in Chugach NationalForest to improve moose habitat.

Observing Wildlife
Teacher Page

Competency: **Observe wildlife**

Tasks:
Use a spotting scope
Use binoculars
Identify major species of locale
Differentiate among males and females of given species

Introduction

Alaska's wild outdoor settings are increasingly rare in the world. More and more tourists are flocking to the state in search of a glimpse of bear, moose, wolf or caribou. Wildlife interpretation usually involves sharing knowledge of local wildlife species, where and when to find the wildlife, and other tidbits to help the visitor understand and appreciate the animals.

Overview

Of the many visitors to Alaska's outdoor settings, most are interested in wildlife. Much of the work of tour guide, park interpreter, or park ranger, involves assisting with wildlife observations. Working with visitors on a "wildlife safari" offers employment in private companies offering tours and with local, state and federal parks, forests and wildlife refuges.

Suggested Learning Activities

1. Take a field trip with someone who is familiar with local birds and game animals. Bring along a spotting scope and binoculars. Use these ocular tools to view whatever wildlife you can find. Use bird books, field guides to identify your "quarry." Try to distinguish between males and females of the same species.
2. Invite an expert to class to show slides identifying local birds and mammals.
3. Take apart some old binoculars or a spotting scope to get a good look at how they magnify things so far away.

Resources

Alaska Department of Fish and Game, P.O. Box 3-2000, Juneau, AK 99811

Alaska State Division of Tourism, P.O. Box E-101, Juneau, AK 99811

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001 *Ask for the brochure **Alaska State Parks.***

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, Ketchikan Area, Federal Building, Ketchikan, AK 99901, Stikine Area, P.O. Box 309, Petersburg, AK 99833, Chatham Area, 204 Siginaka Way, Sitka, AK 99835. *Actively seeks qualified local employees. Forestry Sciences Library in Juneau holds extensive references on recreation topics.*

Books and Pamphlets:

Alaska Department of Fish and Game Wildlife Notebook Series and Activities for Teachers. Available from Alaska Department of Fish and Game in Anchorage, Fairbanks and Juneau. *A series of one page articles describing Alaska's mammals, birds and fish and a set of excellent activities to accompany each article.*

Alaska Mammals, J. Rearden, Alaska Northwest Publishing Company, 137 East Seventh Avenue, Anchorage, AK 99501

"A Checklist of Alaska Mammals," University of Alaska Museum, University of Alaska/Fairbanks, Fairbanks, AK 99701 (fold-out brochure)

Checklist of Alaska Birds, University of Alaska Museum, Fairbanks, Alaska 99701

A Field Guide to the Birds of Alaska, R.H. Armstrong, Alaska Northwest Publishing Company, 137 East Seventh Avenue, Anchorage, AK 99501, 1980.

A Field Guide to Animal Tracks, Olaus Murie, Houghton-Mifflin Co., Boston, 1954

A Field Guide to the Mammals, Houghton-Mifflin Company, Boston, 1964.

Golden Guide to Field Identification. BIRDS of North America, Golden Press, New York, 1966. *Perhaps the authoritative guide to bird watching. Watercolors of all species. A must for the bird watcher.*

A Guide to Wildlife Viewing in Alaska, Nongame Wildlife Program, Game Division, Alaska Department of Fish and Game, 1983.

Observing Wildlife

Are there any tricks to using a spotting scope?

A spotting scope is a powerful monocular used in viewing wildlife. Because of its great magnification, it is usually mounted on a tripod. A spotting scope is ideal for viewing wildlife from a safe distance, and can provide an unforgettable otherwise unattainable visual experience. Carry your spotting scope carefully. It is a delicate instrument and can be damaged with rough care. Carefully focus the spotting scope from lesser to greater powers of magnification, so to center in on the object of focus. One thing to remember is that the telescopic site on a rifle is NEVER to be used as a spotting scope. Never point a firearm at anything you do not intend to shoot. If you go out observing wildlife and are carrying a gun, carry binoculars or a spotting scope as well.

What are some tricks to using binoculars?

Binoculars are optical devices which magnify images stereoscopically, allowing depth vision. Eye pieces may focus individually or the binoculars may have a center focus. If the binoculars have a center focus, you will need to focus the eye piece first and then focus the center until images are sharp. Binoculars and spotting scopes help you see such details as colors, plumages and patterns of different species of wildlife.

How do I know the major species of the locale?

Just about anyone who grew up in the rural areas of Alaska can identify the major mammals. As for large mammals, the major species are common knowledge: caribou, moose, brown or black bear, wolf, sheep, goats, and musk ox. The smaller mammals may be a little harder to identify, not only because they aren't as well known, but because they're a little harder to get a look at. You may spend some time arguing with someone that what you saw was an otter and not a mink, for example. Guidebooks are useful. Many of them have photos, sketches, watercolors, or guides to tracks. To identify birds, use bird books and the advice of other birders to build your identification capabilities. Local bird checklists will be of great help, also.

How do I differentiate among males and females of given species?

Identifying between males and females of given species depends on the species. For example, only the bull moose have large, heavy antlers which are wide, flat and rise slightly upward and backwards. Hanging under the chin of both bull and cow moose are a pieces of loose skin called a "bell." With Sitka blacktail deer only the bucks (males) have antlers. With caribou, both bulls and cows may have antlers. With some species males and females have different coloration. Female birds are usually more drab than males, providing valuable camouflage during egg incubation. Males are more commonly brightly-colored, their markings used as a part of courting displays to attract females. The guidebook or the *Alaska Department of Fish and Game Wildlife Notebook Series* will help you differentiate among males and females. This information can be crucial to hunters, as state law restricts the taking of wildlife to certain sexes during certain times of the year. A guidebook will help.

What about ethics?

In dealing with wildlife, one needs to talk about ethics. Ethics are moral practices. Morality involves thinking about more than yourself–thinking about the animals and how you are affecting them. Good ethical practices mean viewing wildlife on *their* terms, not on yours. Disturb wildlife as little as possible. Don't feed wildlife. Don't disturb parents with young. Don't pick up young animals, even if you think they are "abandoned" or lost. Don't leave food out to attract animals, and don't "pose" or distract them to improve your pictures. Beware of approaching wildlife. Use a telephoto lens for those good closeup shots. Remember to treat wildlife as the delicate resource that it is.

Use First Aid and Survival Skills

Using First Aid
Teacher Page

Competency: **Use first aid**

Tasks: Prepare and check a first aid kit for various occasions including:
- a. hiking
- b. skiing
- c. driving
- d. boating

Check victim's consciousness
Check for breathing
Check for pulse
Check for bleeding
Use CPR
Use a backboard
Transport victim
Obtain Red Cross or other recognized certification

Introduction

First Aid is a must for those who work in the field of outdoor recreation. Challenging weather and geographical conditions in Alaska can be extremely hazardous and unforgiving. Many of the outdoor recreation settings are far from medical facilities. First aid and emergency medical training provides a cadre of trained people in the population ready and able to assist in an emergency. Emergency medicine as a field is growing, as is recognition of the importance of immediate help for the sick and injured–particularly in the backcountry.

Overview

Skills in emergency medicine are readily applicable to a host of other occupations, not the least of which is that of Emergency Medical Technician (EMT). Alaska has an expanding EMT program which provides for the assistance and transportation of those who are injured, especially in rural areas. Red Cross Standard Certification, Advanced First Aid Certification, Emergency Trauma Training (ETT) or EMT, will help the student in a number of fields. The jobs of police officer, fireman, nurse, and safety officer all require or encourage emergency medicine.

Suggested Learning Activities

1. Assemble a first aid kit for your class or small group to take on trips.
2. Invite a CPR trainer to class. In a maximum of four hours, this person can teach you how to check for consciousness, perform the "ABC's of first aid," perform mouth-to-mouth resuscitation, and perform cardiopulmonary resuscitation using special dummies. All members of your class can become certified in this way. S/he can also show you how to check for bleeding and perform other basic first aid measures.

Resources

Emergency Medical Services, Division of Public Health, State of Alaska, P.O. Box H, Juneau, AK 99811-0616 (907) 465-3027. *Contact this agency for a list of classes offered in your area.*

South East Regional Emergency Medical Services Council, (SEREMS),207 Moller Dr. Sitka, Ak. 99835 (907) 747-8005

Books:

Emergency Care, Robert J. Brady Co., Bowie, Maryland 20715 *The text for emergency medical technician training.*

Leadership and Administration of Outdoor Pursuits, Phyllis Ford and James Blanchard, 1985, Venture Publishing, Inc. 1640 Oxford Circle, State College, PA 16803. *Excellent text. Deals with virtually all areas of the outdoor recreation industry.*

Park Ranger Handbook, J.W. Shiner, 1986, Venture Publishing, Inc. 1640 Oxford Circle, State College, PA 16803. *Describes the job of park ranger in detail.*

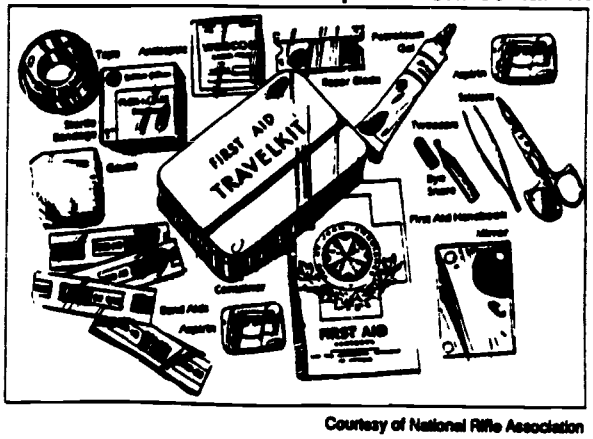
Using First Aid

What kind of first aid kit should I have?

As J.W. Shiner notes in the Park Ranger Handbook, "first aid kit contents will necessarily vary with a variety of obvious factors. Many [areas] use standard 'off-the-shelf' kits available from a variety of suppliers. These kits tend to meet specific requirements–an inventory of existing or proposed kits can be matched with the items listed below (and others felt essential for [your area]). A basic first aid kit includes:

- assorted adhesive bandages
- standard gauze pads (2x2 and 4x4)
- heavy-duty absorbent pads (feminine napkins)
- gauze bandage (2 inch)
- elastic bandage (3 inch)
- adhesive tape (1 inch)
- ammonia inhalants
- triangular bandages
- scissors/forceps
- safety pins
- moleskin

Other items such as alcohol or iodine prep pads, aspirin or acetaminophen, etc., may also be included. All the items should be stored in a waterproof metal container.



Courtesy of National Rifle Association

"The Trauma Kit is used to augment the first aid kit when confronted with serious injuries. Its contents vary depending upon the level of training, access to community paramedical and medical services, and other factors. A basic kit includes:

- portable oxygen unit
- air splints
- trauma dressings (Cederrath Blood-stopper or equivalent)
- large wound compress bandages
- blood pressure kit
- thermometer
- butterfly closures (assorted)
- hemostats
- poison antidote kit
- dental emergency kit
- pain medication (Tylenol #3 or equivalent)

The trauma kit should be stored in waterproof, metal containers with the contents clearly marked on the outside. (Park Ranger Handbook, p. 9-3). Most items in the trauma kit require special training to use.

How do I check for consciousness?

You can't always tell if a person is conscious. Too often a rescuer has come on a scene and taken for granted that someone is injured without checking. The person may be sleeping–or drunk. To check for consciousness, shake and shout, that is, lightly shake the person about the shoulders and ask them "Are you okay? Are you okay?" If the person is an infant, lightly shake the infant about the shoulders and ask the same question, or you may flick the infant on the bottoms of the feet. Do not shake the patient vigorously. Not only will the person not like it much if indeed they are sleeping, but there is the possibility you could aggravate a neck injury. A light shake is best.

How do I check for breathing?

The ABCs of first aid are "Airway, Breathing, Circulation." If your patient is not conscious, you will need to check these three. You check them in this order–A,B, C. You check in that order because if a person is breathing, they have a pulse. They can't breathe unless the airway is open, so you check the airway first. You check for breathing by listening and feeling. Your cheek has very sensitive skin. You can place your cheek by the patient's nostrils and then place your ear in the same place. At the same time, place your hand on the patient's chest to feel if it rises with respirations. If the patient is not breathing, establish an airway, ventilate by pinching the nostrils shut, tipping the head back, covering the victim's mouth with your mouth and blowing five breaths into the victim's mouth. Then, check for a pulse.

How do you check for a pulse?

You check for pulse in a place where it is most pronounced. In an adult that is the carotid artery, in the neck, just to the left side of the patient's Adam's apple. You check the pulse with your middle and index finger. On an infant, the best place to check the pulse is the brachial artery, on the inside of their biceps holding the artery lightly up to the bone. If the patient has no pulse, call out for help (hopefully somebody will be nearby, if not, don't run for help). Stay with the patient and immediately begin CPR.

What about CPR?

Cardio-pulmonary resuscitation (CPR) is a way of reviving a person who has stopped breathing and whose pulse has stopped. CPR should be performed by someone trained in the proper methods. Certification is good for one year. CPR classes are offered in many places. CPR involves making sure the patient is conscious or unconscious, checking for breathing, checking for pulse, and if not present, clearing the airway, and in a regular manner, alternatively ventilating the patient and providing chest compressions to the sternum. CPR has, in many cases, brought patients back from the brink of death. It must be repeated that the specialized training of CPR methods is not difficult to learn and that classes are offered to virtually all ages throughout the state–for free. Take CPR. You might save a life.

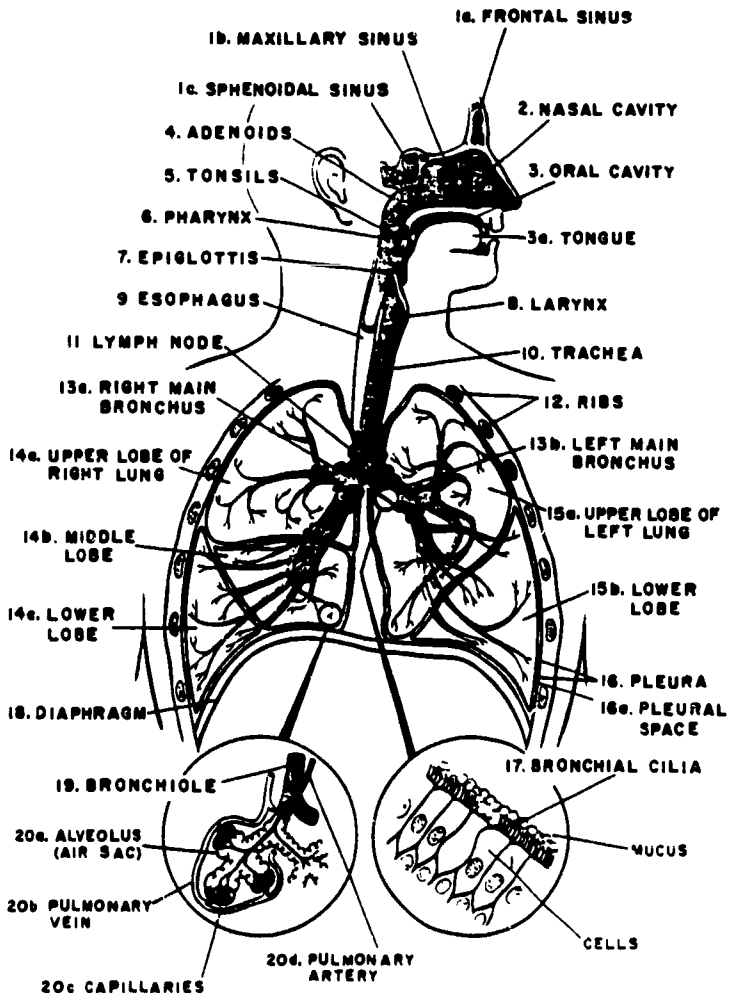
How do I check for bleeding?

If the patient is conscious, identify yourself, ask him/her their name, and what happened. Hopefully the patient will know and will be able to tell you. That will give you some clue as to what to do. Don't always believe a patient, let alone one who has just had an injury. You can tell the person you're there to help, and with their permission, you can feel up and down their body, from the top of the head to the tip of the toes, lightly squeezing, seeing if the patient reacts to your touch, and feeling for blood or something out of place. Providing that the patient is not conscious but is breathing and has a pulse, you will need to check for injury in the same manner. Just because you do not feel anything does not mean the patient is not injured. A skilled first aider or EMT will be able to spot injuries hidden to the lay person. Obtaining emergency medical skills will help you attain the same level of competence.

What is a backboard used for?

One of the great dangers of trauma to a victim is not only the danger from the trauma itself, but also the danger from the trauma of being moved. Far too many patients have been injured by well-intentioned rescuers who, not knowing the victim had a spinal injury, quickly removed the person from a vehicle or pulled them out of the street without considering that they might be doing further injury to the person. A backboard is a way to immobilize a person so that person can be transported without sustaining further injury. Backboards can be either full or half. A full backboard is longer than a person is tall with handles on its sides. The full backboard may have straps to hold the person to the board or the straps can be attached through the handles on the board. A half-board is just a half version of the full backboard. It is typically used for immobilizing a person who has been injured in an upright position (usually in an automobile). The half backboard can be slid behind the patient. Strapping the patient to the half backboard allows the person to be moved onto a full backboard and transported. *Use of backboards and other skills in emergency medicine requires specific training and a high degree of skill. Training programs are offered throughout the state.*

THE RESPIRATORY SYSTEM



What about tips on transporting the victim?

If there was a possibility of neck or spinal injuries, don't transport the victim, unless you have no choice. Leave the victim in place until the arrival of trained personnel. In some cases you will have no choice but to transport the victim–if there's fire danger or if you're in an extremely remote location with little possibility of getting help. In those cases, a backboard or proper stretcher are your next move, keeping the patient perfectly still. Moving a patient with head, neck or spinal injuries requires great skill, and is not for the untrained person to attempt. For problems such as poisoning, whether or not to transport the victim depends on the nature of the poisoning. A good idea is to have several emergency medicine texts on hand and to look up the injury.

How do I obtain Red Cross or other recognized certification?

Classes in emergency medicine are offered throughout the State of Alaska, at universities, colleges, in continuing education classes, through Native organizations, or through Emergency Medical Services councils. The Emergency Medical Services unit of the Alaska Division of Health and Human Services will help you find the nearest available classes.

Wilderness Survival Techniques
Teacher Page

Competency: Learning wilderness survival techniques

Tasks:
Identify treatment for hypothermia
Construct a primitive shelter
Construct crude snowshoes
Signal an aircraft from the ground
Start a fire using scarce materials

Introduction

As studies showed during World War II, presence of mind in a survival situation is of utmost importance. Those who have training in survival are those who survive. Wilderness survival is a skill which comes naturally to many subsistence users, such as the Gambell walrus hunters who survived in open boats in the Bering Sea in spring, 1988. These hunters, initially lost in fog, survived on what they had in their open skiffs until landing again on St. Lawrence Island three weeks later. Wilderness survival skills save lives and add to the safety of many Alaskans practicing subsistence or self-sufficient lifestyles.

Overview

Though many areas in the field of outdoor recreation are becoming areas of employment, (witness the growth in mountain-climbing guides or rafting expeditions for example). Survival itself provides very few jobs. Some people do offer classes in survival techniques, and wilderness survival techniques are employed in emergency medicine, search and rescue, and other areas. Wilderness survival skills can contribute not only to a person's employability, but to their well-being in a host of outdoor situations, as well.

Suggested Learning Activities

1. View the U.S. Coast Guard videotape, "Hypothermia."
2. Role play a hypothermia situation in small groups where one or two people act as hypothermia victims and one or two others provide care.
3. Invite a backcountry ranger to class to discuss experiences with hypothermia victims.
4. Take an overnight field trip where, after watching an expert demonstrate the construction of a lean-to or other primitive structure, you construct your own shelter.
5. Build a fire where you are camping out using waterproof matches and available materials.
6. Use tree boughs and cord to construct crude snowshoes. Tie them onto your feet and try them out in the snow!
7. Role play a situation in which you are stranded far away from people. Demonstrate methods of signalling aircraft for your rescue.

Resources

Books and Articles:

Basic Hunter's Guide, National Rifle Association, Sales Department, P.O. Box 96031, Washington, DC 20090-6031. *Includes an excellent section on wilderness survival and safety. Quotations used by permission National Rifle Association.*

"Satellites on call when planes fall from the sky," by Dean Fosdick, The Associated Press, The Anchorage Times, May 2, 1988.

Seven Steps To Survival, AMSEA, Alaska Marine Safety Education Association, Box 2592, Sitka, Alaska 99835. *Agency promotes marine safety. Publication includes discussion of emergency shelter, water, food, etc.*

Tom Brown's Field Guide To Wilderness Survival, Tom Brown .Jr. with Brandt Morgan Illustrated By Heather Bolyn ,New York, Berkley Books,1983. *Tom Brown is considered one of the truly great wilderness survivalists.*

Wilderness Survival Techniques

How do I treat hypothermia?

Hypothermia is an ailment that occurs when the core of the body is so lowered in temperature that life is threatened. You have to stay warm to live. You can suffer cool temperatures, and if you wear proper clothing and stay dry, you can perform outside in very low temperatures. When you are exposed to the cold and your body's core temperature plummets, you will suffer hypothermia. Note the following list of symptoms of hypothermia from Ford's and Blanchard's LEADERSHIP AND ADMINISTRATION OF OUTDOOR PURSUITS:

99 TO 96 DEGREES: Shivering becomes intense and uncontrollable. Ability to perform complex tasks is impaired.

95 TO 91 DEGREES: Violent shivering persists. Difficulty in speaking, sluggish thinking, and amnesia start to appear.

90 TO 86 DEGREES: Shivering decreases and is replaced by strong muscular rigidity. Exposed skin may become blue or puffy. Muscle coordination is affected, producing erratic or jerky movements. Thinking is less clear; general comprehension of the situation is dulled and may be accompanied by total amnesia. The victim is generally still able to maintain posture and the appearance of psychological contact with his surroundings.

85 TO 81 DEGREES: Victim becomes irrational, loses contact with environment, and drifts into stupor. Muscular rigidity continues. Pulse and respiration are slowed.

80 TO 78 DEGREES: Unconsciousness, the victim does not respond to spoken word. Most reflexes cease to function at this temperature level. Heartbeat becomes erratic.

BELOW 78 DEGREES: Failure of cardiac and respiratory control centers in the brain cause cardiac fibrillation, probably edema and hemorrhage in lungs, and death." (Ford and Blachard, p. 263)

Ford and Blanchard discuss the treatment for hypothermia: "There are several possible treatments for hypothermia, though the options available in the field are usually limited and unfortunately often inadequate. Ideal treatment in a hospital setting may involve the use of sophisticated support systems and techniques." The hospital success rate is very high provided the condition of the victim is not too dire. Such treatments are sadly unavailable to most patients within a reasonable time span. And many hospitals do not have the expertise or experience to carry out such treatments." (Ford and Blanchard, p. 267)

Typically, though, the hospital treats patients by placing them in a warm water bath, arms out. Initially the water temperature they put them is is about 80 degrees F, raised as rapidly as the patient can safely tolerate to about 110 degrees F. What you don't want to do is to mix warm blood near the surface of the body with the cooler blood in the core too quickly. Don't handle the patient roughly. Often victims of hypothermia will be protesting that nothing is wrong and that they are just chilled and will warm up soon. You may have to put up with protests. Help the patient into dry clothes. Feed the patient something sweet. Give the patient water (but never hot liquids) and walk the patient briskly (preferably back towards where you came from) for at least 45 minutes. If you are in a remote area, walk the patient around a lake or up a hill. Get the patient to exercise heavily. If the patient is injured or otherwise unable to exercise, find a campsite, enter a cabin, or otherwise find shelter. Be quick! If there is no shelter available, set up camp immediately or cover the patient with a tarp to provide wind and rain protection. The other campers should huddle around the patient. Give the patient sugary foods.

If you have erected a tent, have a healthy person, unclothed, get into a sleeping bag. If you can zip two bags together, that's all the better. Have someone heat some water on a stove. The patient should disrobe and then get in the bag(s) with the naked rescuer. If two bags have been zipped together, a second unclothed rescuer can climb in the sleeping bags as well. A sleeping bag around a hypothermic patient is not enough; that person is not generating enough heat to warm themselves back up. They need heat from others.

Don't rub or massage the patient's arms and legs. You could mix blood from close to the skin's surface with cooler core blood. After becoming accustomed to being in the bag with the others, place hot water bottles in the bags with the patient. Wrap the bottles (or canteens filled with hot water) in cloth and place them in the groin and armpits of the patient. Feed the patient sugary drinks if conscious. The person may need to urinate. Allow them to urinate in a pan or water bottle so they do not need to leave the bag. Keep the patient in the bag until their oral temperature is at or near 98.6 degrees F. When the person is warmed, help them dress in dry clothing and hike or transport the person to medical facilities. (Ford and Blanchard, pp. 268-269)

How do you construct a primitive shelter?

Choose the most protected spot you can find for your shelter site. A cave, rock outcrop, or fallen tree will provide shelter for the night. If it isn't sufficiently sheltered, use whatever is at hand to make it better. It is of vital importance to stay warm and dry when lost or stranded. Your shelter should protect you from the wind and cold and keep you dry to prevent loss of body heat. Choose a shelter site that will allow you to locate a fire in front of it.

Build the best shelter you can. However, do not waste valuable energy needlessly.

If you are among trees, the quickest and easiest form of shelter is one made from a fallen tree that has ample space between the trunk and the ground. Often all that is necessary is to cut away some of the branches and lean them against the trunk to form a crude type of roof. Be careful not to cut off any of the limbs underneath that may be supporting the tree.

Once you have cut down the tree, cut away blocking boughs and those from the top of the tree. These can be used to thatch the roof and ends. Upon completion of the shelter, locate wood and build a fire at the entrance for warmth.

Another easy shelter to build is a lean-to: a bed made of boughs about eight inches (20 cm.) deep, will provide good insulation from the cold ground. Boughs should be placed in rows with the butt ends toward the ground. To attach the ridgepole of the lean-to, tie the pole, place it in a tree fork, wedge it with a peg in a tree hole, place it in the crotch of another pole, or support it with a tripod. Place the ridgepole and framing poles so that the weight is against the tree trunk. The framing poles should be spaced 12" to 18" apart. Start with the largest boughs at the bottom with butt ends up. Thatch boughs to the top of the framing poles. A bough bed will insulate you from the ground. Boughs should be placed with broken ends toward the ground. For larger fuel, gather dry dead wood. Do not consume energy by cutting wood up. You can have a large fire in front of the shelter. (Basic Hunter's Guide, pp. 249-250)

If you are trying to build a fire in a wet coastal area, you may have some real problems. Those who live in wet costal areas like Southeast Alaska can get a fire started by snapping dry twigs from close to the trunk of spruce trees. Others seek out standing dead cedar trees, which, when pushed over, are dry inside. Dead branches off of other trees may be dry inside. Practicing fire building in a wet climate can help the camper prepare for emergency situations later.

How do you construct emergency snowshoes?

Being caught in deep powder snow without snowshoes can prove lethal. The best way to survive any life-threatening situation is of course to avoid the situation altogether. You can do that by not going when conditions are hazardous. Another way to survive such threats is to have a remedy available when needed. Knowing places or situations where you can get caught in deep snow may prompt you to keep a spare pair in a backcountry cabin, to put a pair in the aircraft you use, or to carry them on your snow machine. Such precautions might keep you from having to construct survival snowshoes in a pinch.

The idea of snowshoes is simply to distribute your weight over a larger surface area. With that increased surface area, you are "floating" on top of the snow in much the way a flat bottomed boat floats on a lake.

The British Columbia Forest Service's publication Wilderness Survival notes that a pair of survival snow shoes can be made of two conifer boughs and rope, string, wire or some other form of fastening. The boughs, about as thick around as a finger, a little over one meter in length, are stripped of branches and leaves, then both ends are brought together to make a teardrop shape. Those ends are lashed one over the other. Webbing is laced across the boughs with 4 to 7 meters of light nylon cord.

How do I signal an aircraft from the ground?

Signalling an aircraft from the ground is not an easy task. The easiest way to get the attention of someone in the air is with an Emergency Locater Transmitter (ELT).

Many aircraft today carry "Emergency Locater Transmitters (ELTs). These devices can be turned on or they will automatically switch on when the aircraft has suffered impact. The ELT's signal is picked up by SARSAT-COSPAS satellites and the location of the downed aircraft is relayed to ground stations, which coordinate rescue efforts. The system is credited with saving the lives of over 1,000 worldwide in the last six years, a quarter of those (237) in Alaska. Studies have shown that if survivors of an air crash are rescued within eight hours, then their survival rate is over 50 percent. If rescue is delayed beyond two days, then survival chances plunge to less than 10 percent.

As a part of the pre-flight briefing the small aircraft pilot should inform all passengers of the location of safety equipment, including the ELT. The passenger should know how to manually activate the ELT in case it does not engage upon impact.

Another way to signal aircraft is by small hand-held radio. Many campers carry hand-held radios, that have aircraft frequencies.

Another way to signal aircraft is with aerial flares from the ground. A pilot does have a wide view. The pilot might be looking one way when you shoot the flare. You are hard to spot from the air, in any case. If you have aerial flares (small ones which easily fit in a pack and which shoot a bright flare several hundred feet into the air), shoot them as much in front of the search aircraft as you can.

You can signal aircraft by erecting a tent or tarp high on a hill or in an open place. Waving bright-colored clothing on a conspicuous place high on a hill might draw the attention of a search aircraft, as would a good-sized fire. You can make a bonfire smoke by placing green branches and leaves on the flames. The more traditional campfire distress signal is three fires about 30-40 feet apart. Beware of the hazards of forest or brush fire in remote areas; you don't want to cause more trouble for yourself. You might have considerable trouble starting a fire in wet conditions. If you live in Southeast or other wet areas, use dead branches growing low on spruce trees or dead cedar trees growing upright in bogs.

Yet another way to alert aircraft might be to spell out "S.O.S." in an open area. You can lay out wood in a large open meadow or you can make enormous letters on the beach. Bush pilots are often quite familiar with the terrain they fly over and often notice changes on the ground.

For information on making a survival kit and finding wild edibles see "Wilderness Survival Techniques" in Self-Sufficiency instructional materials.

Manage, Maintain, and Protect the Resource

Managing, Constructing and Maintaining Facilities

Teacher Page

Competency: **Manage, construct and maintain facilities**

Tasks:
Plan and implement an SOEP, Coop or OJT work experience
Develop a facility and grounds maintenance schedule
Monitor and report facility and grounds maintenance needs
Determine need for private contractors
Estimate cost of services
Maintain and repair water and sewer systems
Maintain and repair structures, conveniences, and oil/gas stoves
Maintain and repair typical park/campground facilities
Maintain grounds and recreation areas
Plan and construct facilities
Make electrical repairs
Form and pour concrete
Maintain roads, culverts and drainage ditches
Observe safety precautions

Introduction

Managing, constructing and maintaining facilities can be very rewarding jobs in the area of outdoor recreation. Nearly all outdoor recreation settings require some sort of maintenance. With most of Alaska's enormous outdoor settings as of yet undeveloped, they require facilities for the managers, interpreters, biologists and law enforcement specialists who manage them–and for visitors. Those facilities call for those who construct, complete and maintain them. Maintenance jobs can pay much better than other jobs for government agencies. In the private realm, including private campgrounds, horse tours, hot springs and ski areas, facilities for visitors are the means by which most in this industry make their living.

Overview

Though many of Alaska's outdoor recreational settings are as of yet undeveloped, the tourist industry is ever-expanding. Many tourists come to Alaska in search of outdoor recreation. These visitors have increasing needs for basic services and facilities, causing expanded employment in building maintenance and upkeep. Private facilities related to the tourist and leisure industry call for increased visitor facilities. Construction of such facilities will provide employment.

Suggested Learning Activities

1. Interview those who work in building management, construction, and maintenance. Ask them about their previous training and daily responsibilities as well as the need to hire subcontractors.
2. Visit an outdoor recreation-related facility and observe the different kinds of activities going on there.
3. Participate in building management, maintenance and construction activities through an SOEP, Coop or OJT work experience project.
4. Investigate the cost of various construction services by calling around and asking for cost estimates involved in services for a hypothetical construction site.

Resources

Hobar Publications, 1234 Tiller Lane, St. Paul, MN 55112. (612) 633-3170. *Numerous publications related to agricultural mechanics and construction fields.*

Future Farmers of America, Box 15160, Alexandria, VA 22309

References

"A Guide For Recognizing And Reducing Tree Hazards In Forest Recreation Sites In The Pacific Northwest, " James S. Hadfield.—Portland, OR : U.S. Forest Service. Pacific Northwest Region.Forest Pest Management, [1982]. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes glossary and references.*

"AMC Field Guide To Trail Building And Maintenance", Robert D. Proudman. [Boston] Appalachian Mountain Club, 1977. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations.*

Construction Trades Curriculum, Vocational Materials Library, Office of Adult and Vocational Education, Alaska Department of Education, Box F, Juneau, AK 99811.

"Guide For Forest Development Road Location, Survey, Design, and Construction", U.S. Forest Service Alaska Region, Subject No. File 383, 1960. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes figures, graphs, and tables.*

How to Work with Concrete and Masonry, Darrel Huff, Popular Science Skill Book, Harper & Roe, New York, 1976.

"Handbook For Forest Roads", Richard H. Mustard, Washington Department of Ecology, 1982. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. includes illustrations, diagrams, graphs, tables, index, and references.*

"Standard Specifications For Construction of Roads and Bridges", U.S. Forest Service, Subject No. File 383, Washington, 1979. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. includes figures and tables.*

"Trucks, Truck Roads, and Landings", U.S. Forest Service, Subject No. File 375.5, Corvallis, OR, 1976. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes chapters "Transport, Logs and Timber; Roads; Yarding."*

Managing, Constructing, and Maintaining Facilities

How do I plan and implement an SOEP, Coop or OJT work experience?

Your teacher will know about programs such as Supervised Occupational Experience Program (SOEP), Cooperative Work Experience (Coop), or On-the-Job Training (OJT) programs. Such programs work with managing, constructing and maintaining facilities, particularly if you live near an outdoor recreation area or facility. With your teacher, you can plan your work experience using Future Farmers of America (FFA) materials or materials from the Office of Adult and Vocational Education, State Department of Education.

How do you schedule facility and grounds maintenance?

Outdoor settings such as golf courses, city parks, state and national parks l. a grounds maintenance schedules. Those schedules organize times when the grass is watered, fertilized, flowers are planted, and gardens are weeded.

How do I purchase materials for facility and grounds maintenance?

Like so much employment today, business skills have great value. Maintenance related to outdoor settings requires ordering and purchasing for facility and grounds maintenance needs. You might need fertilizer, peat, outdoor bulbs to go in the street lamps in the city park. Major parks and facilities will have a procurement officer from whom you could order what you need. S/he would make the purchases for you. You would pick them up from the warehouse. Smaller "mom and pop" operations require you to take on several of the roles yourself.

Would my job involve determining the need for private contractors?

If you are involved in a private construction outfit, you may need help with the project. For example, if you're constructing a campground on the banks of a river or a golf course in what was an open field, you may need to hire a contractor to come in and move some dirt around. If you work for local, state or federal governments in facilities and maintenance of an outdoor setting, it might be your job to examine and determine the need for a private contractor. The idea of examining a company and its capabilities and comparing costs may not be so different. First of all, for "official" jobs with governments, licensed and bonded contractors are often required. Work on your own facility may allow a more informal arrangement, but to be fully protected, licensed and bonded contractors are best. Those involved in the construction industry are faced with decisions like this one every day. Ask contractors for references of other customers they have served.

Do I need to know how to estimate the cost of services?

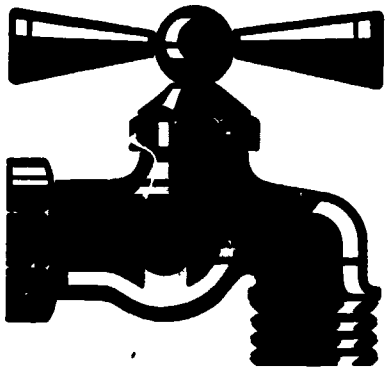
One can certainly learn quite a bit about estimating the cost of services, but often making good estimates involves experience at making other estimates. You might ask "how can I gain experience if in order to gain experience I have to have experience?" That circular question is one of the quandaries of life. A good way to get a feel for estimating the cost of services before shopping for them is to ask someone else who has utilized the same service. Stop by and talk with that person. Take a few notes, make a few calls, and you might have, a ball-park figure of the cost of some services.

How do I maintain and repair water and sewer systems?

Many areas have their own water plant systems. These areas have to employ people with special skills in maintaining water and sewer systems in order to meet operating standards provided by state and federal code regulations. If the area doesn't have its own plant, you will, like any other commercial business, work with city/ borough officials to make sure that your water systems are up to code and are properly tied in with public water and sewer.

How do I repair structures, conveniences, and oil/gas stoves?

Repairs must be in compliance with building codes. As well as meeting state and federal codes, the worker will need to develop a knowledge of local code requirements. Oil/gas stoves are often used in rural areas and in temporary camps. Like other appliances, they must be installed according to code. Follow manufacturer's instructions for installation. Recognize hazards of these devices including explosion, fire and asphyxiation. Make sure all structures and living quarters are equipped with fire extinguishers.



What opportunities are there in maintaining and repairing park/campground facilities?

Many of the outdoor recreation jobs for state and national parks maintenance involve maintaining and repairing typical park/campground facilities. These facilities might include the restrooms/outhouses, water facilities, picnic tables, paths and walkways, display cases and roads. Campgrounds are very popular, providing a range of possibilities, from sites for backpacking tents to parking places for RVs–huge motor homes. Owning a private campground can be very profitable, but what you are providing is *human* facilities. As such, there will be a good deal of maintenance and repairs.

What opportunities exist in maintaining grounds and recreation areas?

Some jobs, in outdoor recreation involve maintaining grounds. Grounds include the areas around buildings, golf courses, playgrounds, and ball fields. Americans spend an amazing amount of time in recreational activities. Demand for proper maintenance of recreational facilities is growing.

Can one find work planning and constructing facilities?

Many outdoor recreation settings require the planning and constructing of facilities. These facilities are provided not only for the comfort and safety of visitors, but also for the protection and maintenance of the resource. As a head of maintenance at one of Alaska's national parks notes: "These are all specialties requiring different talents and education levels to perform. The planner may not necessarily have the ability to do the work. He or she achieves this ability through supervising, directing and communicating with skilled workers."

Could I find a job making electrical repairs?

The head of maintenance at one of Alaska's national parks notes that electrical repairs, like some of the other trades, require specialized talents and education levels. Following local, state and federal codes is of particular importance in this field.

Any special words on forming and pouring concrete?

Experience with the basics of concrete work will help your chances for employment. Whether you have formal or informal experience forming and pouring concrete, it is useful to know the steps in completing a typical concrete job. How to Work with Concrete and Masonry lists those steps as:

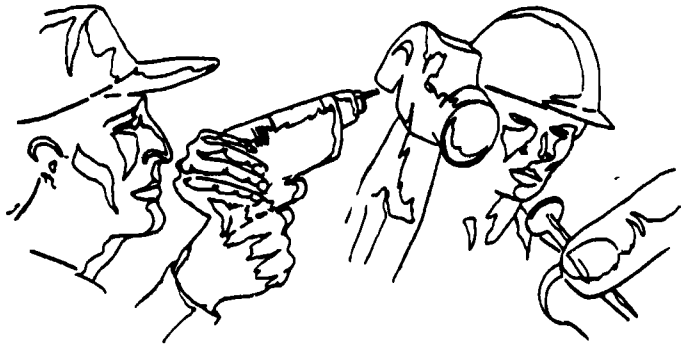
- Excavate and prepare the base for the concrete.
- Build the forms and brace them solidly.
- Place reinforcing steel if you are using any–as you usually should do.
- Make arrangements for one or more helpers unless it's a [one-person] job.
- Order your concrete or ingredients. [Or mix it yourself.]
- Assemble tools–usually rake, shovel, floats, trowel. But don't forget gloves and possibly boots.
- If necessary, wet down the area so concrete won't dry too fast. Or place waterproofing membrane if needed.
- Mix the concrete or dump it from the transit-mix truck. Move it to the site and spread it with rake and shovel, spading and compacting.
- Strike off level, usually with a 2x4.
- Smooth the surface with a wood float.
- Complete finishing with steel trowel or with a broom, depending on finish wanted.
- Keep concrete moist for at least three days for proper hardening. (How to Work With Concrete, p. 3)

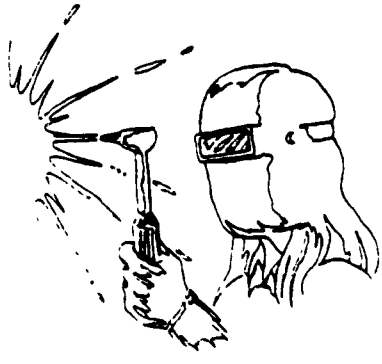
Who maintains roads, culverts and drainage ditches?

For those maintaining private outdoor facilities, maintaining roads, culverts and drainage ditches might count among those jack-of-all trades skills that any owner of such a business would require. For those who work in governments, in many cases private contractors would complete the construction, or in maintaining and upgrading, an outside state or federal office would direct the work. Maintenance, however, would fall into the hands of the maintenance staff. Skills and experience in road construction, maintenance and grading would be very useful.

What are some special concerns for safety?

With any job you have, but especially in those dealing with equipment and maintenance, safety is of primary concern. When operating equipment or working on structures, a steel helmet is important. When moving heavy objects or when working with tools, steel toes offer extra protection. Gloves protect hands from abrasion and from cold and wet conditions. The Alaska climate calls for specialized clothing. Businesses and government learned a long time ago that safe operation is good business. Sometimes safety takes a little more time, but not a lot more time. Wearing the protective clothing, following established safety procedures and thinking ahead will all equal safety on the job. Additionally, safety is in many cases trade related. Each trade has its own safety requirements.





Maintaining Parks and Recreation Areas
Teacher Page

Competency: **Maintain parks and recreation areas**

Tasks: Interpret park campground rules and regulations to visitors or co-workers, and provide user information to the park or campground visitors
Maintain records and develop a plan of day-to-day operation and safety
Maintain:

a. cabins
b. campgrounds
c. canoe routes
d. cross-country ski trails
e. cycling trails
f. hiking trails
g. historic sites
h. horseback trails
i. scenic roads
j. skiing areas
k. snowmobile trails
l. swimming beaches
m. wayside rests

Introduction

Some of the best jobs relating to outdoor recreation involve the maintenance of the facilities. Those who maintain the facilities often have the advantages of living near or in the attractive resource and in many cases don't suffer the policy or enforcement headaches of administrators. In some cases, with the federal government, they make more money. Some maintenance jobs are related to constructing or improving private recreational facilities.

Overview

Alaska has one of the fastest-growing tourist economies in the world. The state is becoming a major tourist destination. Tourists require facilities and those facilities require maintenance. Building maintenance is a job in increasing demand in the state. Maintaining the infrastructure to serve visitors requires workers.

Suggested Learning Activities

1. Visit local parks or campgrounds to determine typical rules and regulations. Talk with rangers and other park staff about how they inform visitors of rules and regulations - and how they enforce them when broken.
2. Assist park maintenance staff with routine daily tasks such as trail maintenance, garbage collection, building upkeep. Ask to see how they keep records.

Resources

Books:

"Assessing And Monitoring Backcountry Trail Conditions", David N. Cole.—Ogden, UT : Inter-mountain For, & Range Experimental Station, 1983. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations,graphs, maps, and references.*

Cleaning Recreation Sites, Briar Cook, U.S. Department of Agriculture, Publication No. 8023 1801, Equipment Development Center, San Dimas, California 91773, July 1980. *Includes chapters "Cleaning Vault Toilets, Cleaning Garbage Cans, Pressure Washers."*

Cleaning Recreation Sites...an Update, Briar Cook, Forest Service—USDA, Publication No. 8023-1801, Technology & Development Center, 444 East Bonita Avenue, San Dimas, CA 91773, March 1988. *Includes chapters "Cleaning Flush Toilets, Cleaning Garbage Cans, Cleaning Rocks & Masonry."*

"Forest Service Cabin Use", Gary H. Sanders.—[Juneau] : U.S. Forest Service. Alaska Region, 1986. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes maps and references.*

"Forest Trails Handbook", U.S. Forest Service.—Washington, U.S. Forest Service , rev. 1944. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes figures.*

"Hand Drilling And Breaking Rock For Wilderness Trail Maintenance", Dale Mrkich.—Missoula, MT: Equipment development center, 1984. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations, figures, tables, and references.*

"Step By Step For Better Trails", U.S. Forest Service. Alaska Region.—[Juneau]: USFS. [1983]. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations.*

"Trail Construction In The National Forests", U.S. Forest Service, — : Washington, D.C., 1915. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations and index.*

Venture Publishing, Inc., 1640 Oxford Circle, State College, PA 16803, (814) 234-4561. *This publisher specializes in textbooks for recreation and parks and leisure studies. Of special consequence to this area is the Park Ranger Handbook by J.W. Shiner, 1986.*

Maintaining Parks and Recreation Areas

What's involved in interpreting park campground rules and regulations to visitors?

In a private campground or other outdoor setting you might be owner, operator, trash collector, and guide. In such an area, your rules and regulations would be posted, and you would remind visitors of the rules of the camp as well as those of the surrounding area. In a state or federal area, however, dealing with visitors may not be a part of the regular routine of the maintenance employee. An entry-level job might be to empty the waste receptacles in a city park or to weed a flower garden. Visitors still ask you questions. You will be seen as a person of authority. For some, you might be the only "official" employee they run across. Make sure you know the ropes of the local outdoor setting. Offer the information you can, and if need be, refer them on to an information booth or park interpreter. Your contact with visitors can be crucial. Courts have found that *all* employees of outdoor settings have the assumption of authority. Your help for the visitor must be accurate and help provide for the visitor's safety and comfort.

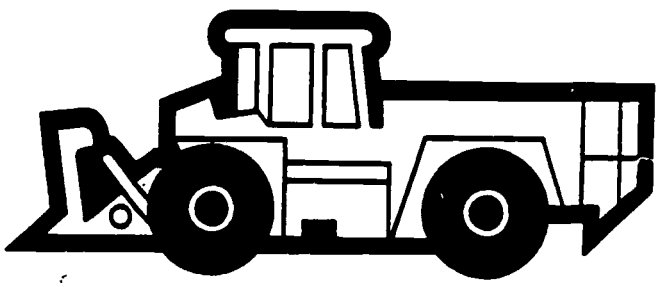
What's involved in maintaining records?

Owners and operators of private campgrounds and other outdoor settings have to keep the same records that any small business must keep. Those in larger areas or those who work for the government keep records of a different sort. The fuel of government is paperwork and those in middle to higher-level maintenance positions spend a good bit of their time completing forms. These records might involve payroll, ordering equipment, making out work orders, noting work completed, etc. Businesses and government keep records related to safety as well.

What are some other maintenance jobs in the Alaska outdoors?

In Alaska, outdoor maintenance tasks might involve hiking up a mountain to replace a trail sign, running a tracking machine over a cross country ski trail, grooming snow in a ski area, building bridges or planking hiking trails, mowing the lawn at a historic site, routing horseback trails, trimming along scenic roads, picking up litter on swimming beaches, or cleaning wayside rests. Such jobs can be the most attractive because you actually get *out*. Each area would have its own requirements. The skills required would be those specified by the supervisor.

As a director of maintenance notes, "planning goes far beyond putting in simple trails. Managers and assistants develop long-range plans. They prepare estimates and requests for funding for future long-range needs. They have to be tuned in or be able to predict future requirements. Nothing ever stays the same. Laws, codes, visitor use patterns, and more are continually changing and managers must have the ability to adjust their operation to meet these changing needs with minimum impact to their resource."



Protecting Visitors and Park Resources
Teacher Page

Competency: Protect visitors and park resources

Tasks:
List the major liabilities and responsibilities involved in protection of park resources and visitors
Post and maintain park directions and warnings
Post park rules and regulations
Recognize need for medical assistance
Administer emergency first aid
Develop plans to protect visitors from dangerous animals and other hazards
Develop plans to protect animals and plants and other resources from visitors
Monitor and supervise camping and fishing areas
Operate and maintain structural fire fighting equipment and tools
Operate and maintain wildland fire fighting equipment and tools
Construct and maintain wildfire protection lanes
Supervise and maintain park sanitation
Explain current fish and game laws
Record information concerning possible parks and recreation violations
Write a citation

Introduction

Protection jobs in outdoor settings have evolved in recent times. Until the 1970s for example, though National Park Rangers all had law enforcement duties, many of them had only received a minimum of training. Today, not only do NPS permanent rangers receive the full 400-hour Federal Law Enforcement Training Center (FLETC) training, many state park rangers (and technicians) receive parallel training. Such changes have taken place nationwide, reflecting genuine pressures on recreation facilities. In short, somebody has to handle crimes that are committed in such outdoor settings.

Overview

Law enforcement officers for government agencies receive law-enforcement training. Some state park personnel receive training at the state trooper's academy, and others obtain training on their own. Though some who work for these agencies are involved strictly with interpretation and some work strictly with maintenance, law enforcement training falls, in the very least, in the realm of skills which would better prepare someone to obtain work. For technician work calling for law enforcement duties, the NPS requires, 200 hours of training with 40 hours of updated training annually. To fill the need for law enforcement background, junior colleges, colleges, technical schools and universities in several places around the nation offer 200-hour training to qualify people for such technician jobs. Contact agencies listed below for exact requirements.

Suggested Learning Activities

1. Brainstorm reasons for providing law enforcement protection in parks.
2. Invite an enforcement officer to class to discuss past training, daily responsibilities. Ask him/her to show you how to report and record parks and recreation violations using appropriate forms, and to demonstrate how a citation is written. Use copies of forms to role play the appropriate procedures to use when observing, recording, and citing for a violation.
3. Take a hike on a popular local trail. Determine who maintains it. Note what rules and regulations are posted. Look for possible hazards to hikers and places in which hikers have been hazardous to the area the trail crosses. Talk with rangers, game wardens, protection officers, or naturalists you encounter on your hike - ask them what it's like working with visitors to the area and what is the extent of protection needed for visitors and the countryside alike.

4. Take a class in emergency first aid.
5. Role play various situations in which someone is hurt in the backcountry. (sprains, cuts, abrasions, neck or spinal injuries, broken bones). What first aid or rescue measures would you take?
6. Brainstorm ways of protecting the backcountry environment from visitors.

Resources

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, P.O. Box 21628, Juneau, AK 99802-1628

Books and References

"An Improved Wildland Firefighting Handtool," USDA Forest Service. *Available from Forestry Sciences Lab., Juneau.*

Mountains Without Handrails, Joseph L. Sax, University of Michigan Press, 1980. *A book which criticizes making outdoor settings too "safe." Focuses on the long-standing and bitter battles over recreational use of national parklands.*

Venture Publishing, Inc., 1640 Oxford Circle, State College, PA 16803, (814) 234-4561. *This publisher specializes in textbooks for recreation and parks and leisure studies. Of special consequence to this area is the Park Ranger Handbook by J.W. Shiner, 1986.*

Protecting Visitors and Park Resources

What is it like working with visitors to parks and other recreational settings?

Hopefully, if you are looking into work in outdoor recreation, you like sharing the excitement of visitors' discoveries with them. Working with visitors in outdoor recreation, like working with people in other fields, requires a lot of patience. Visitors to outdoor settings are often out of their element, are far from home, and are surrounded by strangers. They might have traveled for hours that day, they may be a little turned around, and, they just might not be a nice person. In those circumstances, working with visitors might seem pretty unattractive. But there's the other side. However, the excitement of showing something new to somebody, the joy of working with people who are doing something they like, and the invigorating nature of the outdoor setting itself makes it all worthwhile. For this reason there are usually far more applicants for jobs in outdoor recreation than there are jobs to match them with.

Do I need to post and maintain park directions and warnings?

In outdoor settings many visitors are out of their element. They may hike too hard, too long, without proper equipment in hazardous settings. In some cases those who own or manage the recreational setting have been held responsible for injuries incurred. In many places in the Lower 48, outdoor settings, trails, parks, and other recreational facilities have posted signs warning visitors of hazards. Alaska's outdoor settings, many of them undeveloped, typically don't have signs, ropes, and handrails to protect visitors from dangerous conditions.

Do I need to tell people about rules and regulations?

Those who work in recreational settings have an obligation to those who use the recreational setting. Alaskan outdoor settings present real hazards for the user and sometimes the user presents real hazards to the setting. Rules and regulations are created to protect them from each other. Depending on what your outdoor recreation job is, whether you are are taking people on backpacking trips or selling curios in a gift shop, you have an obligation to be familiar with rules and regulations and to inform the visitor of what they are. Even if you know a shortcut across private land or know another way to bend the rules a little, don't advise the public to follow your lead.

What training do I need in emergency first aid?

Those who work in outdoor settings typically are often trained in first aid. First aid is help given before the arrival of a doctor or other medical personnel. Many high schools, colleges, Native corporations and other groups offer classes in emergency first aid. Upon completion of your first aid course, depending on the course of study you followed, you can be certified. Standard certifications are Red Cross Standard First Aid, Red Cross Advanced First Aid, Emergency Trauma Training (ETT), or Emergency Medical Technician (EMT). The latter two certifications are with the State of Alaska.

At what point do I need to call for medical assistance when somebody's hurt?

Calling for help is a judgment. One simple rule is to have the visitor do as much as they can on their own, and whatever they cannot do, to help them with. For example, if the person is in a family, in a car, and has what may be a sprain and is in need of an X-ray., you don't need to call an ambulance. Training in emergency medicine will tell you when a person needs to be transported (i.e. help is called) and when a person can make it on his/her own. When in doubt, err on the side of being conservative. In other words, if you are suspicious as to a person's ability to make it on his/her own, call for help.

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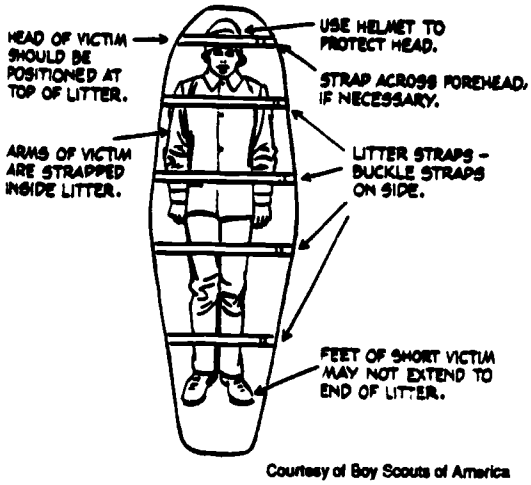


Courtesy of Boy Scouts of America

How far should we go to protect visitors from dangerous animals and other hazards?

A great deal of discussion has taken place in the field of recreation about how much protection visitors in outdoor settings require. This discussion is of particular importance in Alaska because outdoor recreation settings in Alaska can be very hazardous. For example, every year hundreds of climbers scramble up the slopes of Mt. McKinley, the highest point in North America. Nearly every year one or more lose their lives. How do those working in the outdoor recreation field in Alaska help protect climbers from these hazards? How *should* those who hope to meet nature on her own terms be protected? Should the mountains have handrails, and should the government maintain high-altitude helicopters to rescue climbers who get into trouble? These questions are debated frequently. But what is currently being done? Those who use outdoor settings are warned beforehand of hazards they will encounter. Those who own private recreational settings need to make a special effort to see that visitors are not hurt on their property. Decision-makers for local, state and federal governments take hazards for visitors into special consideration when deciding policies for outdoor settings.

How do I develop plans to protect animals, plants and other resources from visitors?

A common controversy in the field of outdoor recreation is: which is of greater importance, visitor safety or visitor freedom in the out of doors. Visitor safety is the primary focus in the recreation industry. How can we protect

the resource from the visitor? ATVs, mountain bikes, jeeps and other vehicles can spell the doom of fragile plants. Careless visitors can toss a cigarette butt, causing a forest fire which can consume hundreds of thousands of acres. Photographers wanting an even better shot could spook and drown a moose or caribou. Campers leaving their food open in their campsite can lure a bear to dinner–and possible death when the bear habitually does the same thing. For these reasons, managers of outdoor settings create *management plans*. These management plans restrict certain visitor activities to certain areas at certain times. Federal, state and local laws protect resources in the same way.

To create these plans, managers document use (and abuse), including photos, sketches, and other evidence; draft plans for protection (often based on scientific research); publish those plans in draft form for public review and comment; and, with public input, publish the plan. Changes in plans may have the power of law. If so, they would be enforced by rangers, troopers or other law enforcement officers.

What are some tips on monitoring and supervising camping and fishing areas?

As any law enforcement officer can relate, walking that line between authority and friendliness is a difficult job. Agencies assist in that effort by providing you (in many cases) with a uniform or hat which tells the visitor or other user who you are and makes introductions obvious. Courtesy and fairness to all are important in the enforcement business. For example, if the policy of your supervisor or agency is to cite for all violations, follow those directions. If you are to obtain compliance through your own choice of enforcement, from reminders to "courtesy tags" or warning tickets, you may have to use your own judgement.

Something to watch out for in the enforcement business is the "sob story" or the "line." Both are designed to soften your reaction to a violation. You'll need to remember that an infraction may be a violation with consequences. At the same time, you need to remember the human side of your job.

Campgrounds may involve fee collection. Make sure that the visitor knows well beforehand the exact fees required, then diligently following through with collecting them. Courteous reminders may be in order for those tardy or who forget.

What about operating and maintaining structural fire fighting equipment and tools?

Some of the work of those responsible for facilities in remote locations may involve training in structural fire suppression. Structural fires are building fires, as opposed to wildland fires, which is fire fighting of a different kind. Many outdoor recreation areas are remote, far from urban fire-fighting facilities. Fire fighting skills not only may help you get a job, they also may save lives and property. Fire fighting skills are usually easy to pick up. Nearly every community in the state has a volunteer or municipal fire fighting department. Such departments are often in need of volunteers. They regularly update their skills through regular training. Volunteering at the fire department is an excellent place to both benefit your community and to attain skills for work in outdoor settings.

How can I operate and maintain wildland fire fighting equipment and tools?

Fire fighting, both structural and wildland, is skilled work. Though major fires may call for unskilled volunteers, typically both structural and wildland fire fighters are trained for their work. Usually such training not only involves training with equipment, but physical ability. To be certified to work on a fire, you may be asked to take a "step test" or one and a half mile run in which your cardio-vascular strength is measured. A step test involves exerting yourself for a set time, stepping up and down on a stool, then taking your pulse to see how well you can take exertion. Every summer a number of Alaska Natives and others are hired out of villages to fight wild fires on Bureau of Land Management (BLM) lands throughout the state and in the Lower 48. These people are trained in fire-fighting techniques and equipment. That training includes the step test, and a two-day course on basic fire fighting, fire behavior and first aid. Trained fire fighters obtain a "Red Card" which allows them to work on fires on federal and state land. On fires these fire fighters are trained to use shovels, pulaskis (a tool which is something like a hoe and axe combined) and a *Fedco*, a backpack tank which allows a fire fighter to squirt water on spot fires. Currently over seventy wildfire fire fighting crews are found in Alaska. These crews represent over 2,000 trained wildland fire fighters. These fire fighters are hired to fight fires on BLM and state lands in Alaska,

and federal and state recreational and other lands in the Lower 48. In the summer of 1988, 62 crews from Alaska, over 1200 fire fighters fought in the area of Yellowstone National Park and other areas in the Lower 48.

For information regarding this program, contact the BLM or the Alaska Department of Natural Resources.

How do I construct and maintain wildfire protection lanes?

An important tool of the fire fighter is the construction of wildlife protection lanes. These lanes are swaths through the forest which are cut by teams of fire fighters with chainsaws or bulldozed using heavy equipment. These lanes are built around unmanageable fires or built along natural lines of protection to contain fires. Then, *backfires* may be set–actually set– to burn up the fuel between that fire protection lane and the fire itself. The fire fighters then station themselves along the wildfire protection lane, putting out spot fires which cross the lane. The lane allows equipment to access the area, separates the burning area from the non-burning area, and in essence, allows the backfire to halt the wildlife by eliminating all the available fuel. Construction and maintenance of wildfire protection lanes falls under the jurisdiction of a fire boss. In some cases fire lanes are pre-constructed in areas prone to burning.

How do I maintain human sanitation?

Many of the jobs in the field of outdoor recreation, deals with visitors. Those visitors, in most cases, need services of some sort. Those services include sanitation. Having safe drinking water, proper sewage facilities, and a place to dispose of refuse are basics. A small setting such as a private campground may have well water and outhouses, but some thought has to go into both. You obviously wouldn't want the outhouse located near the well. In major destinations such as Denali Park or some state and federal historic sites and other destinations, those involved with sanitation have the same challenges as those who would provide water and sewage facilities in a small city or village. In fact, those responsible for sanitation in those sites are trained in the same manner as those who supply urban services.

What about explaining current fish and game laws?

To the out-of-town visitor, *any* employee will be an authority. Don't wing it when it comes to fish and game laws. If a visitor asks you about catch limits or size limits or whether or not they have to have a license, know the rules. If you don't know them, refer the visitor to someone or to publications which can answer their questions accurately, then find out right away for the next time. Have local fish and game regulations on hand for visitors.

How should I record information concerning parks and recreation violations?

For those who work in outdoor recreation in the private sector, reporting–and recording–parks and recreation violations is a matter of morality. Outfitters and guides can, however, be liable for the hunting violations their customers commit–under certain circumstances. It is important that private owners abide by local, state and federal laws. Abiding by those laws–and informing visitors of those laws–is important. If you're a state or federal employee working in an outdoor setting, recording information about violations will in many cases be part of your job. State Fish and Wildlife Protection officers, Fish and Game officials, Bureau of Land Management officials, U.S. Fish and Wildlife Service officers and National Park Service Rangers and other personnel have a set procedure for recording violations. They record these incidents on standard forms, obtaining information such as date, time, description of incident, persons involved, witnesses, sketch and photograph of incident, and other such pertinent data for later review. Much of what they do is parallel to what a police officer anywhere records in response to a violation or complaint.

Any tricks to writing a citation?

For those who work in outdoor settings, writing a citation is among the most distasteful of tasks. Nobody likes to reprimand someone on their vacation. But on the other hand, the role of law enforcement is *compliance* and the purpose is to protect visitors and the environment. Citations are one way to gain compliance. Some areas have a policy of writing a citation for every violation. Others specify the conditions under which citations are used.

Working with Wildlife
Teacher Page

Competency: **Work with wildlife**

Tasks:
Practice ethical handling of wildlife
Use a live trap
Approach wildlife carefully
Carry a firearm
Radio tag wildlife
Transport wildlife safely
Use a tranquilizing gun

Introduction

Some of the work in outdoor settings involves working with wildlife. The management of wildlife in Alaska falls under the jurisdiction of several agencies. Parks, refuges and other areas used for recreation in many cases double as wildlife refuges. Denali National Park is a good example. Denali is a very popular recreation setting in the state, but those who work there (for the National Park Service) may also, in the course of their work, work with wildlife as well. Similarly, managers for the U.S. Forest Service or Native corporations often deal with wildlife issues.

Overview

With some exceptions, the job of working directly with wildlife will fall under the supervision of a wildlife biologist. Some familiarity with techniques of working with wildlife, however, has benefits in a number of related fields. As studies have shown, the prime focus of visitors to Alaska is wildlife. Those who work in the visitor industry (and virtually all who work in the outdoor recreation field do) have something to do with tours, talks or walks which concentrate on wildlife.

Suggested Learning Activities

1. Invite a wildlife biologist to class to talk with you and show slides about how to handle large animals in the field, including use of bear traps, tranquilizing guns, and radio tags. Have a look at this equipment in real life, if possible. Ask him/her to describe studies involving the use of radio tags for the management of different species.
2. Debate the question, "What should we do with garbage bears?" Consider the fact that relocated bears usually make it back to their home turf -even when it's far away.
3. Role play this situation: one student observes a female bear rummaging through a garbage can in the street. Another student notices two tiny cubs frolicking in the nearby woods. What are your options? What would the consequences be of each option, for bears and humans alike? What option do you think would be best? Why?

Resources

Alaska Department of Fish and Game, P.O. Box 3-2000, Juneau, AK 99811

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

U.S. Forest Service, Alaska Region, Federal Building, P.O. Box 21628-WL/F, Juneau, AK 99802.

"Bear Guns," William R. Meehan and John F. Thilenius, from Alaska Fish and Game Magazine, May-June, 1984, pp. 16-17)

"Discovering Birding In The National Forests", U.S. Forest Service. —Washington, D.C. : USFS, 1978. *Available through U.S.F.S. Juneau.*

"Effects of highways on wildlife", prepared for the U.S. Department of Transportation Federal Highway Administration, Office of Research & Development, Environmental Division.- Washington, D.C. : The Administration ; Springfield, Va. : National Technical Information Service [distributor], 1982. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau.*

"Nonconsumptive Outdoor Recreation", Stephen A. Boyle, Fred Samson, —Washington D.C. : U.S. Fish and Wildlife Service, 1983. *An annotated bibliography of human -wildlife interaction. Available from U.S.F.W.S. Anchorage.*

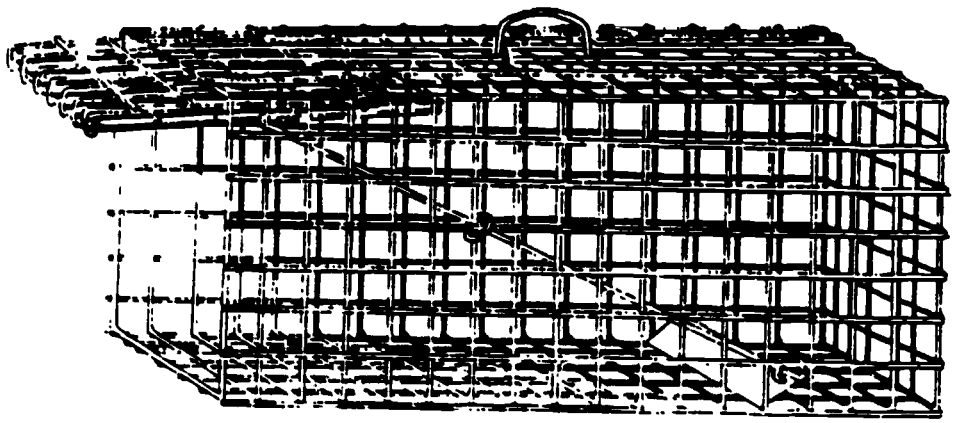
"Nonconsumptive Use Of Wildlife In The United States", William W. Shaw and William R. Mangun.— Washington, D.C.: U.S. Fish and Wildlife Service, 1984. *Available from U.S.F.W.S., Anchorage. Includes references.*

Working with Wildlife

What is meant by "the ethical handling of wildlife"?

Ethics involves morals, having a sense for the pain and well-being of another person or creature. The ethical handling of wildlife involves morality. This ethic extends to overall consideration for the resource, including keeping ATVs on trails, taking care with fire, not disturbing wildlife with aircraft, or feeding animals.

Anytime wildlife is captured and handled it is traumatic to the wildlife. Only in specific projects, under the jurisdiction of a wildlife biologist or other qualified personnel, would one attempt to capture or handle wildlife. Young animals, even when you believe they are orphans or were "abandoned by their parents" are protected by state law from capture.



When do we use a live trap?

Live traps are used for animal capture when there is a purpose for the capture, such as research or animal control, when the animal is needed for repopulating another area, or when there may be some benefit in relocating the animal. Sometimes nuisance bears have been relocated rather than destroyed. Though such projects have usually proven to be a failure, they demonstrate the lengths to which managers may go to protect wildlife from humans, and vice-versa.

How do I approach captured wildlife?

Stay on your guard for your own protection. Just a few years back a captured grizzly in Montana was being released in a remote area. The wildlife officer climbed on top of the cage, let the animal go, and the grizzly immediately turned, hurled the cage from the truck and proceeded to maul the officer. Wildlife, even captured wildlife, should be approached carefully–very carefully.

Will I carry a firearm for wildlife protection?

Many recreational users in Alaska carry a firearm for bear protection. Some debate has centered on which gun is effective against bears, as some rural Alaskans are in the habit of carrying large-bore handguns for bear protection. Studies by the U.S. Forest Service demonstrated that such large bore handguns as a .44 magnum handgun were similar in performance to the weakest of the high-powered rifles. Shotguns did not fare well in their tests, even though they are often the weapon of choice for many. Based on the Forest Service tests, "four cartridge-bullet combinations appear superior for protection against bears:

- .458 magnum, 510-gr soft-point bullet. For a shooter who can handle the recoil of this cartridge, a bolt-action rifle in this caliber is the surest weapon available.
- .375 magnum, 300-gr soft-point bullet. The recoil of a rifle in this caliber, although considerably less than that of the .458 magnum, is still severe for many people.
- .338 magnum, 300-gr bullet. This combination appears to be a good choice. Recoil is somewhat less than that of the .375 magnum.
- .30-06, 220-gr bullet. Mild recoil, compared with that of the large-and medium-bore cartridges, makes this a strong contender for shooters who are sensitive to recoil. ("Bear Guns," pp. 16-17)

What is the value of radio tagging wildlife?

Radio telemetry, or the radio tagging of wildlife can be extremely useful to the wildlife biologist. The biologist, through a system of triangulation, or locating the animal by determining the direction of the signal from several places, can help the biologist to plot movements of the animal at different times of the day, and at different times of the year. Radio telemetry may be used for problem wildlife, for endangered wildlife, or for wildlife slated for study. For outdoor settings used for recreation, such data may assist managers in determining uses and regulations related to the wildlife.

In one study, the National Park Service and the Alaska Department of Fish and Game engaged in a cooperative study of the status and movement of Dall's sheep in the western Brooks Range. Seventeen Dall sheep were captured, radio-collared, and studied to determine the animals' seasonal movements. These studies were used in the management of the Dall sheep populations in these outdoor settings.

How do I transport wildlife safely?

Today the live trap can be used to transport wildlife. Nuisance bears can be trapped in live traps constructed of culvert pipe welded on a trailer. The trap has a steel door on a spring which is triggered by the bear tugging on the bait inside. This trap is parked where the nuisance bear has been seen, is baited, and left. When the bear is trapped, it may be tranquilizer and transported, or simply transported. Radio-tagged bears on Admiralty Island in Southeast Alaska are shot with tranquilizing guns from helicopters and then transported to a level area for scientific measurements in a net below the helicopter. Other live traps for smaller animals include small cages with spring-released doors. Captured wildlife is transported in the cage, or in some cases in crates. Bald eagles, captured in Southeast Alaska and transported to New York, were transported in wooden cages. Transporting wildlife, like other technical tasks involving wildlife, is directed by a wildlife biologist. Transporting wildlife is usually done only as a last resort for nuisance animals, to rebuild populations, or for scientific purposes.

How do I use a tranquilizing gun?

Today's tranquilizing guns resemble shotguns. They are used to immobilize game for scientific study or for safe transporting. Typically it is wildlife biologists which use these devices, not technicians. These guns are the same guns used for livestock control, and they are purchased from farm suppliers. In fact the tags, tattooing, and other tagging material which rangers and biologists use is the same material used for cattle. Today, much of the tranquilizing is done from helicopters, though some stalking for deer or other animals is done from the ground. The tranquilizing gun used by the Alaska Department of Fish and Game is a 32 gauge shotgun. The animals (usually bears) are hit in the hip. The tranquilizing drug may take effect quickly or it may take effect over an hour or more–depending on the species and individual tranquilized. If the drug takes awhile to take effect, wildlife biologists or technicians may spend a good bit of time trying to find the animals. After making scientific measurements, the animal must be left in an erect position to prevent suffocation. An ADF & G biologist related that it is important not to leave the unconscious animal near water–it may stagger up, fall and drown.

It must be emphasized that tranquilizing wildlife is highly specialized craft, only occasionally used in wildlife management. Tranquilizing involves sophisticated equipment, specialized drugs, and a high degree of skill. Only a few specially trained biologists in the state use this effective wildlife management tool.

Planning Recreational Settings
Teacher Page

Competency: Help plan recreational settings

Tasks:
Identify and classify major soil types
Read and interpret legal land descriptions
Contrast visitor and natural resource (wildlife) carrying capacities of a recreational site
Read and interpret maps, charts and aerial photographs
Identify principles of recreation management as they relate to protecting the resource
Help plan protected wetlands
Explain the role of organizations such as sportsmen clubs or organizations like Ducks Unlimited in resource management
Perform habitat improvement
Cooperate with landowners in habitat improvement
Encourage cities and boroughs to become involved in recreational planning
Plan public access to recreational settings
Develop nature study areas
Protect shoreline habitat through zoning
Contact legislators concerning planning areas or recreational development
Assist in the development of land, wildlife and water resource conservation plans for recreational areas
Develop private recreational areas
Plan a private camping or picnic area
Plan a private recreation lodge or cabin
Assess developing a private game farm
Assess the profitability of golf courses or other such recreational developments in Alaska
Assess the profitability of other resorts in Alaska
Assess the profitability of marinas in Alaska

Introduction

The changes brought to Alaska by the oil boom have introduced boundaries where they were none, have brought government designations and regulations to areas which were previously self-governing. These changes were intended to soften impacts on Alaska's natural and human resources. Planning has fallen to the professional land planner. The University of Alaska/Fairbanks and other universities offer degree programs in natural resources management.

Overview

The land planner brings together a number of disciplines and occupations needs to understand the resource with some of the intimacy of the biologist. The planner needs the administrative skills of the business person, and the writing skills of a technical writer, as well as an ability to decipher maps, photos and data. The "Alaska Career Guide" states that employers "state the most desirable master's degree is in planning, but degrees in public administration and business are also helpful. A bachelor's degree in city planning, land resource management, architecture or engineering may qualify one for some entry positions. A background in fisheries or oil industry economics is advantageous." The guide shows 250 employed statewide in this field.

Suggested Learning Activities

1. Invite someone to class whose work is in the field of planning - especially in recreation. Ask him/her to discuss previous training, responsibilities on the job, relationship between recreation management and resource protection,etc.
2. Take a field trip with a geologist or soils scientist (the U.S. Forest Service hires a number of these) who can introduce you to the different soil types found in strata in several cut-bank locations. Perform some soils sampling in different areas, using screens of varying mesh sizes to show how different grain sizes are separated and classified.
3. Experiment with different soils and their drainage capacities: Put about a cup each of different soils into containers. Pour 1/4 cup of water into each soil sample and keep track of how long it takes for the water to become absorbed into the soil.
4. Experiment with soil weight: mix equal quantities of different types of soils together in a jar. Dump the entire contents into a large glass container of water. Observe which soils settle down first, second, etc. Which are the lightest soils? Which are heaviest?
5. Invite a city assessor to class who can talk with you about how to read and interpret legal land descrip tions.
6. Invite a planner to class to show you how to read and interpret maps, charts, and aerial photographs for planning purposes. Ask about how closely local landowners are involved in planning and habitat im provement.
7. Visit the planning department in a nearby town. Find out what kinds of development are planned for local wetlands, what precautions or protection measures are built in for wildlife habitat, what conserva tion plans apply to land, wildlife and water in local recreation area development. Find out how shoreline habitat is protected through zoning. Ask about the extent of their involvement in recreational planning. Contact politicians and let them know what you think of planned developments.
8. Attend local governing board meetings. Speak out in favor of recreational planning and specific projects that you support.
9. Invite a representative of Ducks Unlimited or another sportsmens club to discuss the role of their organi zation in resource management.
10. Contact the local planning department or a representative of the Alaska Department of Fish and Game to find out about local habitat improvement projects in which you can participate - get involved as a volunteer!
11. Find an area near your school where you establish a nature trail with study stations along the way. Obtain permission to use the area, then then perform an inventory of the area's natural features that might become the foci of study . Build or improve the trail, then set up markers to indicate study loca tions. You might plan a nature walk where students act as trail guides or you might cooperatively write a self-guiding trail brochure. Publicize your nature study area and let the tours begin! (Older students might take younger children through the study area, for example.)
12. Visit local private recreational areas, camping/picnic areas, recreation lodges, golf courses, marinas, resorts, or game farms. Ask the owners how they went about planning and developing these areas. Find out if the developments have been profitable for the owners.
13. Plan, build, and evaluate models of community designs, using Project Wild, "Planning for People and Wildlife, " page 187.
14. Find out how local Native people managed to maintain historical use of natural resources with so little impact.

Resources

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Environmental Analysis for Land-Use and Site Planning, edited by William A. Marsh, McGraw-Hill.

The Guide to Self-Sufficiency, John Seymour, Hearst Books, New York, 1976.

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"Medicine For The Outdoors ", Paul S. Auerbach.—Boston : Little, Brown & Co., 1986. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes glossary and references. Includes illustrations , glossary, index, and references.*

Office of Adult and Vocational Education, Vocational Materials Library, P.O. Box F, Juneau, AK 99811. *The OAVE has some excellent materials on entrepreneurship. Such materials would be most useful to the aspiring small business person thinking about developing a private recreational area.*

Recreation Planning and Design, Seymour M. Gold, McGraw-Hill Book Co., 1980.

"Recreational Use Of Wild Lands", Frank C. Brockman.—New York: McGraw-Hill, c1979. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau.Includes illustrations.*

Trail Design, Construction and Maintenance, William Birchard, Jr. and Robert Proudman, Appalachian Trail Conference, 1981.

Wilderness Management, John C. Hendee, U.S. Department of Agriculture, Miscellaneous Publication No. 1365, Robert C. Lucas, Wilderness Management Research Project Leader, Intermountain Forest and Range Experiment Station, Missoula, Montana, October 1978. *Available through U.S. Forest Service, Forestry Sciences Lab., Juneau. Includes chapters "The Need for Wilderness Management, Wilderness Ecosystems, Wildlife in Wilderness."*

Venture Publishing, Inc., 1640 Oxford Circle, State College, PA 16803, (814) 234-4561. *This publisher specializes in textbooks for recreation and parks and leisure studies. A title particularly applicable to this area is PLANNING PARKS FOR PEOPLE, by Hultsman, Cottrell and Hultsman, 1987.*

World Leisure and Recreation Association, 559 King Edward Avenue, Room 108, University of Ottawa Campus, Ottawa, Ontario, Canada K1N 7N6 *The INTERNATIONAL DIRECTORY OF ACADEMIC INSTITUTIONS I contains information about 1000 academic institutions involved in leisure, park, recreation, tourism, and many other related fields.*

Planning Recreational Settings

What are the major soil types?

As John Seymour states in *The Guide to Self-Sufficiency*, "the basis of all life on Earth, is, of course, the soil. But the soil that we animals who live on land have to draw our living from is the powdered rock that covers, fortunately for us, much of the land surface of the Earth. Some of this powder, or earth, was derived from the rock directly below it; some has been carried down by water from rock somewhere above it, some such as the well-known loess soil of America and China) has been blown there by wind, and some dragged into its present position by glaciers during one of the ice ages. But, however, the soil got to where it is now, it was originally pulverized from the rock by the force of weather. Frost splits rock; so does alternate intense heat and cold; water wears it; wind erodes it; and it is now known that bacteria and certain algae actually eat it; The hardest rock in the world will be ground down and eroded in time if it comes to the surface.

"Newly-formed soil will have all the plant foods that were in the original rock, but it will completely lack one essential element–humus. It will not contain humus until life itself–that is, things that were living and have died and are in decay–puts it there. Only then does it become real complete soil, fit to grow the vegetation that sustains all animal life on land.

"Because soil derives from many kinds of rock, there are many varieties of soil. As we cannot always get exactly the kind of soil that we require, we must learn to make the best of the soil that we have. Depending on the size of their particles soils are classified as *light* or *heavy*, with an infinite range of gradations in between. Light means composed of large particles. Heavy means composed of small particles. Gravel can hardly be called soil but sand can, and pure sand is the lightest soil you can get. The kind of clay which is made of the very smallest particles is the heaviest. The terms "light" and "heavy" in this context have nothing to do with weight, but with the ease of working of the soil. You can dig sand, or otherwise work with it, no matter how wet is is, and do it no harm. Heavy clay is very hard to dig or plow, gets very sticky, and is easily damaged by working it when it is wet.

"What we call soil generally has a thickness to be measured in inches rather than feet. It merges below with the subsoil which is generally pretty humus-free, but may be rich in mineral foods needed by plants. Deep-rooting plants such as some trees, lucerne or alfalfa, comfrey, and many herbs, send their roots right down into the subsoil, and extract these nutriments from it. The nature of the subsoil is very important because of its influence on drainage. If it is heavy clay [or permafrost] for example, then the drainage will be poor and the field will be wet. If it is sand, gravel, decayed chalk or limestone, then the field will probably be dry. Below the subsoil lies rock, and rock goes on down to the center of the Earth. The rock, too, can affect drainage: chalk, limestone, sandstone and other pervious rocks make for good drainage: clay (geologists consider this a rock too), slate, mudstone, some shales, granite and other igneous rocks generally make for poor drainage. Badly-drained soils can always be drained–providing enough expenditure of labor and capital is put into doing it." (The Guide to Self-Sufficiency, pp. 13-14)

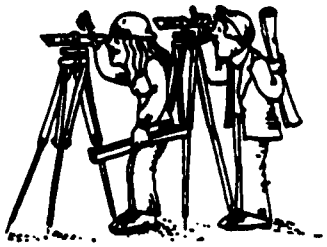
Do I have to be able to read and interpret legal land descriptions?

To purchase property for a private recreational setting such as a golf course, campground or other area, you would operate just like anyone else in search of a piece of property. If you are under the jurisdiction of a local government such as a city or borough, you may obtain the legal land description of the property from the city and borough assessor's office. Typically the assessor can help you interpret the land descriptions. Professional land managers, many of whom work for city, state and federal governments, make interpretation of legal land descriptions their business. Other resources for reading and interpreting these descriptions include Native corporations and attorneys.

How do visitor and natural resource (wildlife) carrying capacities of a recreational site differ?

As the National Rifle Association notes, "Carrying capacity is the ability of a given habitat to support or carry a number of a particular wildlife species. The carrying capacity of habitat changes for place to place, from season to season, and from year to year. When carrying capacity is at its lowest, usually in the critical winter period, those animals in excess of that number must either move to new habitat or perish..." (Basic Hunter's Guide, p. 22)

As a Alaska State Parks supervisor notes, "carrying capacity is affected by resource sensitivity and expectation of visitors and type of area. Visitors expect less contact with other visitors in a wilderness than in a recreation area. Topography, geography, and vegetation density affect the "carrying capacity." Sometimes visitors are screened so more people can use an area without feeling 'crowded.'"



Courtesy of Mountain Management Services

What are some tips on reading and interpreting maps, charts and aerial photographs?

Good books are available for map and compass-reading skills.

As the Alaska State Parks supervisor states, "minimize human impact on the resource through disbursement–spread use out over an area; or restrict intense use to one area to reduce impact on other, more sensitive, areas. Design parking areas and other facilities as tools to manage the use. Maintain the level of facilities in proportion to the sensitivity and carrying capacity of the resource."

What principles of recreation management relate to protecting the resource?

The state parks supervisor continues: "Displacement–as people use an area the resource and experience change, demand leads to development of facilities to greater, even increasing degrees of development. As the experience changes, the people who liked it 'the way it was' will look elsewhere for that same experience, thus they are 'displaced' as facilities are developed to protect the resource and provide for visitors."

How can I help plan protected wetlands?

The state parks supervisor states, "participate in planning meetings, review plans and comment. Comment on projects proposed for wetlands. Join Audubon [National Audubon Society] or other groups active in wetland planning. Talk to elected officials and tell them what you'd like to see."

Wetlands can be reclaimed. Every citizen can help in their protection. Let trees grow up, grasslands go wild. Though large-scale habitat improvement projects are not as of yet needed in Alaska, they are elsewhere. In the Lower 48, and indeed in certain parts of Alaska we have seen pollution of water and/or food, we have seen an alteration of the freshwater habitat and dredging/filling/draining of wetlands. Obviously careful planning and resistance to some of the disturbances listed above can help protect wetlands.

The state classifies wetlands and protects them with "buffers" of protected land.

What is the role of organizations such as sportsmen clubs or organizations like Ducks Unlimited in resource management?

These organizations fund planning and research. They also purchase rich habitat lands in danger of development or loss as habitation. They educate the public, especially young people in outdoor ethics. They support the work of government agencies in research, planning and management of public lands.

How can I perform habitat improvement?

Contact the Alaska Department of Fish and Game or the U.S. Forest Service to identify any habitat enhancement projects on public land. In the Lower 48 and in other areas where reclamation of habitat takes place, the types of plants which wildlife use for food and shelter is planted. In the Tok area volunteers have used small bulldozers and chainsaws to crush and cut down old willow to stimulate nutritious new growth for winter moose browse. Before cutting or crushing, most of the old willow plants were 15 to 30 feet high, too high for even adult moose to reach.

Is it important to cooperate with landowners in habitat improvement?

Major landowners are critical in terms of habitat. Though Alaska has few private individuals with major land holdings, Native and village corporations manage enormous acreage. These Native organizations have a major stake in habitat preservation. Where land is dedicated to agriculture, landowners can improve habitat by allowing fence rows to grow, providing greenbelts, preserving key habitat like stream banks and shoreline, properly disposing of wastes, and abiding by local, state and federal laws.

How do I help encourage cities and boroughs to become involved in recreational planning?

Local, borough, state and federal governments all concern themselves with recreational planning. Money, acquired through the Land and Water Conservation Fund (LWCF), attained through sales of offshore leases for petroleum exploration and other such sales, provide funds for both small and large scale projects. Examples of projects which communities might plan include:

- outdoor winter sports facilities such as lighted cross-country ski trails, skating areas and sledding, especially those located adjacent to schools;
- swimming areas for water safety instruction and mid-summer recreation;
- field sports area and archery range for "traditional" and "modern" sports; and indoor recreation facilities for native games, potlatches, dances, musical events and sports especially during the mid-winter months (a type of project for funds must be sought from a source other than the LWCF which cannot fund outdoor recreation projects).

Plans for uses of such funds are open to comments. Contact local, borough, state or federal agencies for details on this planning process.

Who should have access to recreational settings?

Outdoor recreation settings are typically open to the public. Though the European tradition for wildlife reserves was to provide areas for royalty to hunt, the U.S., in a large way, invented the concept of public outdoor settings. Public access to such settings is an American tradition. For private land, however, the landowner must be contacted prior to using the land. Native lands may have restricted uses. In all cases, contact land owners before using private lands for recreational purposes. For public lands, contact the land managing agency for details of activities permitted. Many public recreational areas are making sure that facilities are handicapped-accessible. Signs are being printed in different languages, and recreation area interpreters study foreign languages and signing for the deaf to make recreational settings more accessible.

A dispute in the establishment of wilderness areas is that these areas are basically accessible only to the the healthy and wealthy. What facilities are constructed to open recreational settings to the general public, the elderly and the handicapped will continue to be an area of debate, especially in Alaska, in the years to come.

How do I help develop nature study areas?

During the environmental education push during the 1970s a number of "nature study" areas were established around the nation. Though environmental education does not have the push it had then, outdoor education programs remain a part of the curriculum in many school districts. For example, an outdoor education building and program is a major feature of Central Park in New York City. Some schools maintain nature study areas, while many in Alaska are blessed with proximity to outdoor settings for study. Those who wish to help develop such nature study areas can contact state or federal parks. Such study areas are often developed in conjunction with those agencies.

Is there a way to protect shoreline habitat through zoning?

Shoreline is of particular concern in terms of development. It is so important that all coastal communities in the United States are required to submit a Coastal Zoning Plan (CZM) to protect coastlines. Any construction on shorelines requires a permit from the Army Corps of Engineers. An Environmental Impact Statement (EIS) is required.

Does it help to contact legislators concerning planning areas or recreational development?

You bet. Legislators base the programs they support and the bills they back on public input they receive. Legislators *need* that input in order to make t proper decisions.

How can I assist in the development of land, wildlife and water resource conservation plans for recreational areas?

Alaska's large-scale public recreation lands include national forests, parks and wildlife refuges, as well as BLM lands, state parks, and state recreational areas. These areas are all managed according to management plans. These management plans are open for public input. This public input is received during a public comment period, or it is received at public meetings. Public concerns must be addressed.

How do I develop private recreational areas?

For private recreational areas, local, state, and sometimes federal permits are required, depending on the type of recreational area, the location, and the service to be provided. Anytime you are offering services to the public, there are public facilities involved, including restrooms, waste disposal, drinking water, and shelter, all of which are subject to local, state and federal codes. A city/borough planning department is a good place to start to find

out the kinds of permits needed and the facilities required. Others who have started private recreational areas, including campgrounds, resorts, golf courses, tourist businesses, horseback riding stables, or other recreational facilities, can answer questions about the kinds of challenges they faced in building their business. Alaska's visitor industry is expanding. Private facilities are needed to accommodate those visitors. Entrepreneurs in Alaska will fill those needs or out-of-state businesses will sweep in and do so. Opportunities are there.

How do I plan a private camping or picnic area?

Private camping or picnic areas must go through the permitting process. A business license, construction permits, and, depending on facilities constructed, other permits are required. Such an establishment is, of course, a business. It requires a business plan. That plan will outline how the site will be constructed, staff required, materials required, and projected costs for the first few years of business.

How do I plan a private recreation lodge or cabin?

As with private camping or picnic areas, permits and review is almost always required. Insurance is a must in such public facilities, and the business plan for such a business should concern itself with such areas as providing food service and finding employees.

Is it worth it to develop a private game farm?

The type of private game farm, where private hunters pay for the privilege to hunt on private land is of course out of the ordinary in Alaska, a "Last Frontier" for hunters. But such private game farms have long been the norm in Europe, where the whole idea of "wild" parks took hold as private hunting reserves for royalty. In the Lower 48 some hunting takes place on huge private ranches, where in some cases, the game is cultivated on private land solely for hunting. Some see such developments as akin to fish hatcheries; others are appalled that game would be hunted in a managed private area. With Alaska's rich game resources and wild open lands, such game farms may not be feasible yet.

Are golf courses or other such recreational developments profitable in Alaska?

When one thinks of outdoor recreation in Alaska, of course they think of Alaska's magnificent outdoor settings, but a prominent form of outdoor recreation in the Lower 48 is golfing. Obviously golfing has a limited season in the state, but golfers are a dedicated lot. All major urban areas in Alaska have golf courses. Golf courses can be very profitable businesses. Limited seasons in Alaska, however, limit their profitability. Nonetheless, such small-scale recreational developments will undoubtedly continue to have a place in the state; leisure is an evolving industry, with increasing importance in Alaska as well as Outside. Other moderately-sized outdoor recreation areas like ski areas, horseback riding areas, and other developments have much in common with golf courses—they may require major land purchases, are seasonal in use, and recreational in nature. Many of these developed resorts involve municipal governments in their operation. Only governments have the resources to purchase and development the large sites required. But Alaska has potential for private operators, and proposals for private ski and other such recreational developments are seen more commonly every day. One example is a recent news report of a major Eagle River ski development proposed by foreign developers.

Are other resorts profitable in Alaska?

Alaska has a number of resorts, from large hotels in the area of Denali Park, to wilderness lodges in the Brooks Range, to fishing resorts in Southeast Alaska. A number of families make their living from these private resorts. Pick up any issue of *Alaska Magazine* or other such publication, and you can see the names of some of these private lodges. In some cases, these lodges are *inholdings* in public parks or wilderness areas.

How profitable are marinas in Alaska?

Another area which is profitable is marinas. Marina owners on the sea must obtain permits from the Army Corps of Engineers and other government agencies in order to construct in coastal areas. These private marinas may sell gasoline, boat products, bait, and fishing products, as well as leasing or renting boat slips. Public marinas fall under the domain of the Alaska Department of Transportation. Marinas, docks and other public facilities are constructed with a combination of state and federal funds.

Technical Information
Teacher Page

Competency: **Incorporate technical information into recreation site management practices**

Tasks:
Record scientific data
Maintain a current file of technical information
Analyze data relative to the operation
Assess new practices, equipment and materials based on research or technical information
Interpret technical information relative to occupations
Participate in a wildlife count

Introduction

Recreational areas in Alaska have greater use and potential than just for human *use*. Part of the inherent qualities of those recreational areas lies in the fact they are wild. It seems a contradiction that a land can be used *because* it is wild, and maintaining both use and wildness at the same time is the challenge of the land manager. Technical information is the tool of the land manager.

Overview

A somewhat recent invention related to outdoor settings has been the evolution of the professional land manager. Today a number of universities offer programs in land management, and in fact, land planning has become a very viable profession in Alaska. Cities employ land planners, as do other governments, Native organizations, and resource developers. Though in the post oil boom era in Alaska some of that employment dropped, resource management remains a field employing a large number of Alaskans.

Suggested Learning Activities

1. Invite a professional land manager to class. Interview him/her about previous training, responsibilities on the job. Find out how he/she collects, analyzes, and applies human use data on the job.
2. Find out about changes in practices, equipment, or materials used in public-owned outdoor settings. Design a simple survey to determine visitors' reactions. Perform the survey; collate results, present findings to agencies administering the changes.
3. Participate in a wildlife or bird census, accompanying biologists or local amateur ornithologists into the field.

Resources

Alaska State Division of Tourism, P.O. Box E, Juneau, AK 99811

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001 *Ask for the brochure **Alaska State Parks.***

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, P.O. Box 21628, Juneau, AK 99802-1628

References

"The Alaska Public Survey", Roger N. Clark, St. Paul, MN: University of Minnesota. Agriculture Experimental Station, 1981. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. A comprehensive assessment of recreational values and use patterns and natural resource management.*

"Attitudes And Preferences In Nine Wilderness And Other Roadless Areas", Robert C. Lucas.—Ogden, UT: Intermountain Forestry & Range Experiment Station., 1980. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations, maps, and references.*

"Common Problems And Potential Solutions", David N. Cole, Margaret E. Petersen and Robert C. Lucas.—[Ogden, UT]: intermountain Research Station, 1987. *Available through Forestry Sciences Lab, U.S. Forest Service, Juneau. Includes references.*

"Monitoring And Evaluating Changes And Trends In Recreation Opportunity Supply", George H. Stankey, Perry J. Brown, Roger N. Clark.—Corvallis : Oregon State University, College of Forestry, 1983. —(SAF : 83-14). *Proceedings of an international conference.*

"Outdoor Recreation Trends Symposium", Ed. Jim Wood.—Atlanta, Georgia: National Park Service, 1985. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes maps and references.*

Technical Information

How do I record scientific data?

Recreation personnel record a good bit of scientific data. Small recreational settings such as private campgrounds would not be involved in recording scientific information. Areas such as state and national parks, national forests, wildlife refuges, and other public lands, though, keep a variety of data. This data has many purposes and uses. In some cases the data relates to outdoor recreation: human uses of the areas. Employees record visitation statistics. daily use (Recreation Visitor Days–RVDs), and overnight stays. This data shows how heavily areas are being used, whether taxpayer money is being wisely spent, and how well the area is being managed.

How do I maintain a current file of technical information?

Statistics on use of outdoor recreation areas and information related to the resource such as bird or other wildlife sightings would be entered into logs which are compiled into reports. These reports would be eventually entered into a computer. Some of the computer entering occurs earlier in the process, even daily. That information is compiled and analyzed, and trends can be charted. Analyzing such trends can help the outdoor recreation planner to make decisions related to the outdoor setting.

How do I analyze data relative to the operation?

It's usually not the entry-level employee who analyzes data. Use of the information concerning human use of the resource might be analyzed at the site, or at a regional or state office. Scientific data may be analyzed in collaboration with a university or other outside group in order to make planning decisions about the recreational area.

How do I assess new practices, equipment and materials based on research or technical information?

Unless you work in a very large outdoor setting, your assessments of new practices and equipment would be done informally. In larger outdoor settings, however, the procedure for obtaining visitors' reactions to new practices, equipment and materials may be based on a survey. Typically major changes in public-owned outdoor settings call for a public hearing. Input from public hearings becomes a part of management plans which determine the rules and policies for these outdoor settings. Assessment becomes a matter of attaining that public reaction. It must be remembered, however, that it is not the entry-level employee who makes these major policy and management decisions.

Which occupations handle technical information?

Resource managers are those who deal with the resource itself. Parks and wildlife refuges usually fall under the jurisdiction of a chief scientist. Projects related to the resource itself may be conducted "in house", that is with those on the staff, or they may be "farmed out" to universities or private consultants.

How do I help with a wildlife count?

Human impacts, the relative health of a particular ecosystem, and the potential harvest of an area to be hunted are measured via a wildlife count. Fish and Game Technicians for the ADF&G run weirs in remote locations to count salmon. Likewise, biological technicians in Glacier Bay National Park count humpback whales to assess impact. Aerial surveys determine the relative health of caribou populations, and caribou migrations are noted in certain passes of the Brooks Range.

Define the Resource

Alaska's Park and Recreation Resources
Teacher Page

Competency: **Name Alaska's park and recreation resources**

Tasks:
Identify national park areas in Alaska
Identify state park areas in Alaska
Identify national wildlife refuge areas in Alaska
Identify national marine refuge areas in Alaska
Identify federal wilderness areas in Alaska
Identify Alaska's national forests
Identify local recreational sites
Identify Alaska's private recreation areas
Identify national and state historic sites in Alaska
Explain the recreational aspects of Alaska's natural resources

Introduction

Alaska is a vast park setting. Including half the area of the National Park Service, the nation's largest state park, the nation's largest national forest, the nation's only National Forest Monuments (Admiralty Island and Misty Fiords), and most of the acreage of the system of National Wildlife Refuges, Alaska holds a good share of all the potential recreational land of the United States.

Overview

Over half of the acreage of the National Park Service lies in Alaska. While some of the enormous national parks in Alaska have just a few employees, the payroll of some of the more popular places, such as Denali National Park, swells to the hundreds in the summer. While it is true that some of the seasonal jobs are not high-paying, the permanent jobs can offer a respectable salary. State or national park jobs can be very attractive and rewarding ways to make a living. State park employment is limited, however, and too many of the national park jobs go to non-Alaskans, despite a local hire program. If Alaskans know more about employment, requirements and application procedures for these jobs, more of this employment could go to Alaskans.

Suggested Learning Activities

1. Draw a neatly-labelled map of Alaska in which national and state parks, wildlife and marine refuges, wilderness areas, forests, historic sites, and recreational areas are clearly marked using a color key.
2. Prepare a 3-dimensional map similar to that described in activity #1, using papier mache or clay. Allow to dry, then paint and neatly label your map.
3. Draw a neatly-labelled map of your local area, designating local and private recreational sites as well as national and state parks, refuges, etc.
4. Visit nearby national or state parks, refuges, wilderness areas, forests, historic sites, and recreational areas. Find out what sorts of uses and activities are permitted in these areas.
5. Identify some of the local "hot issues"related to recreation and natural resources. Choose one issue, research it carefully, and conduct a debate about the issue.

Resources

Alaska Natural Resource and Outdoor Education Association (ANROE), P.O. Box 110536, Anchorage, AK 99511-00536. *Association of educators interested in and promoting natural history education.*

Alaska Natural History Association (ANHA), c/o National Park Service, 2525 Gambell St., Anchorage, AK 99503. *Publishes books and distributes information on a variety of natural history, parks and recreation topics. Write for information. Their publications are available at Alaska Public Lands Information Centers in Anchorage, Fairbanks, Tok, and (soon to be) Ketchikan.*

Alaska Outdoor Council, 3417 Katlian, Eagle River, AK 99801.

Alaska State Division of Tourism, P.O. Box E, Juneau, AK 99811

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001 *Ask for the brochure **Alaska State Parks.***

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513. *The brochure "BLM in Alaska " maps out public lands around the state.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503. *Cooperatively involved in the Alaska Public Lands Information Centers in Anchorage and Fairbanks.*

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, Ketchikan Area, Federal Building, Ketchikan, AK 99901, Stikine Area, P.O. Box 309, Petersburg, AK 99833, Chatham Area, 204 Siginaka Way, Sitka, AK 99835. *Actively seeks qualified local employees. Forestry Sciences Library in Juneau holds extensive references on recreation topics.*

Books and References

THE ALASKA ALMANAC, FACTS ABOUT ALASKA , Alaska Northwest Publishing Company, 137 East Seventh Ave., Anchorage, AK 99501, 1988

Alaska's Parklands: The Complete Guide, The Mountaineers, 715 Pike Street, Seattle, WA 98101

"The Alaska Public Survey", Roger N. Clark.—St. Paul , MN : University of Minnesota. Agriculture Exper.. Stn., 1981. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes glossary and references. Includes references.*

"Carrying Capacity in Recreational Settings", George H. Stankey.—Leisure Sciences 6(4) :453-473. 1984. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes references.*

"Conflict in The Great Outdoors", Bryan Hobson.—Birmingham, AL : University of Alabama.Bureau of Public Administration, 1979. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations and references.*

"Cruiseship Travel in Alaska ", Donald R. Field.—[s.1. : s.n.., 1984]. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes references.*

"How Should Alaska's Federal Recreational Lands Be Developed?", Comptroller General of the United States.—Washington, D.C. : U.S. General Accounting Office , 1979. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Views of Alaska residents and visitors.*

"Impacts Of Backcountry Recreation", David N. Cole.—[Ogden, UT] : Intermountain For. & Range Exper. Stn., 1981. *Includes indexes and references.*

"Influences Of Recreation", Roger N. Clark.—Portland, OR : Pac. N.W. For. & Range Experimental Station, 1985. *Includes diagrams and references.*

"Recreational Impact On Wildlands"; Ed. Ruth Ittner.—[Portland, OR] : U.S. For. Ser. Pac. NW Region, [1979]. *Includes illustrations, diagrams, graphs, maps, tables, and references.*

"Recreation Guide R10-RG.", U.S. Forest Service.—Alaska Region .—Juneau: The Region, 1986. *Available through Forestry Sciences Lab. U.S. Forest Service, Juneau. Includes illustrations.*

Alaska's Park and Recreation Resources

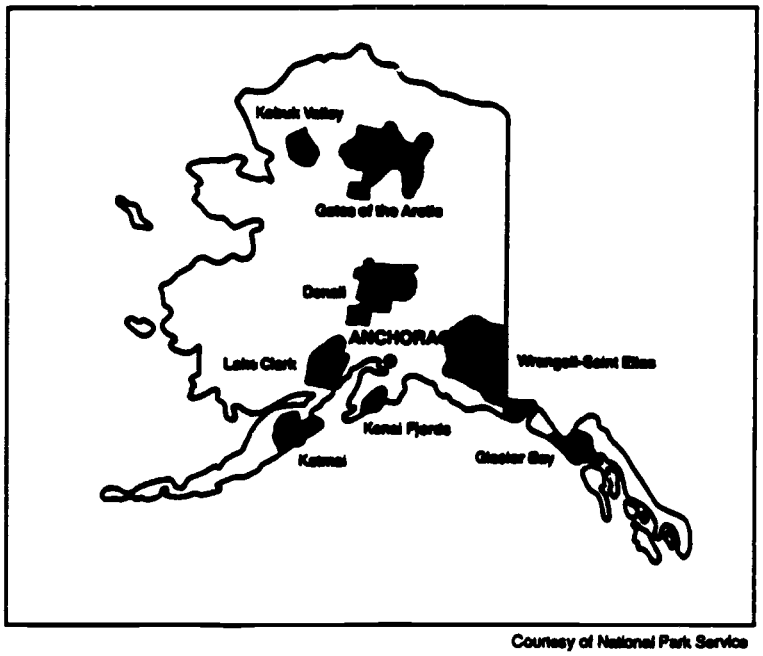
Where are the national parks in Alaska?

Alaska holds over half of the area of the entire National Park Service. The largest National Park in Alaska–as well asthe largest National Park in the United States is Wrangell St.-Elias National Park, near Glennallen. Alaskans are generally familiarwith Alaska's original National Park Service areas, Denali (formerly Mt. McKinley National Park), Glacier Bay, and Katmai, but may not know about Sitka National Historic Park, Bering Land Bridge National Preserve, or Aniakchak National Monument and Preserve. The list of the National Park areas in Alaska includes:

- **Aniakchak National Monument-** 217,000 hectares (537,000 acres). Located on the Alaska Peninsula. Contains an extinct volcano with surrounding landscape.
- **Bering Land Bridge National Preserve-** 1 million hectares (2.5 million acres) Located between Nome and Kotzebue on the Seward Peninsula and Preserves archaeological sites, grizzly bears, fox, wolf and moose.
- **Cape Krusenstern National Monument-** 178,000 hectares (441,000 acres) Located north of Kotzebue on the Chukchi Sea. Preserves unrivaled archaeological records.
- **Denali National Park and Preserve-** 2.4 million hectares (6 million acres). Located between Anchorage and Fairbanks. Includes Mt. McKinley, the highest point in North America and outstanding wildlife resources.
- **Gates of the Arctic Park and Preserve-** 3.3 million hectares (8.2 million acres) Located halfway between Fairbanks and Barrow in the Brooks Range and lies due west of the Dalton Highway. Includes the scenic heartland of the Brooks Range.
- **Glacier Bay National Park and Preserve-** 1.3 million hectares. (3.28 million acres) Located due west of Juneau. Includes outstanding tidewater glaciers, wild beaches, and lofty peaks.
- **Katmai National Park and Preserve-** 1.7 million hectares (4 million acres) Located south, southwest of Anchorage on the Alaska peninsula. Contains volcanic activity, brown bear habitat, outstanding fishing
- **Kenai Fjords National Park-** 214,000 hectares (529,000 acres) Includes tidewater glaciers, jagged shoreline, habitat for moose and mountain goats.
- **Klondike Gold Rush National Historic Park-** 5,255 hectares (12,990 acres) Located at S Skagway. Includes renovated historic goldrush town, 33-mile hiking trail following the Trail of '98.
- **Kobuk Valley National Park-** 688,000 hectares (1.7 million acres). Located due east of Kotzebue on the Kobuk River. Important subsistence area. Remnant flora of late Pleistocene times.
- **Lake Clark National Park and Preserve-** 1.4 million hectares (3.4 million acres) Located west of Anchorage across Cook Inlet.
- **Noatak National Preserve-** 2.5 million hectares (6.2 million acres) Located east northeast of Kotzebue. Protects the largest untouched river basin in the United States.
- **Sitka National Historical Park-** 48 hectares (108 acres) Located at Sitka. Contains site of battle between Tlingits and Russians. Also includes historic Russian bishop's house.
- **Wrangell-St. Elias National Park and Preserve-** 4.7 million hectares (11.6 million acres) Located east, southeast of Glennallen. The largest national park in the United States, also one of the most impressive with massive glacial formations, wild rivers, and towering peaks.
- **Yukon-Charley Rivers National Preserve—** 85,000 hectares (2.1 million acres) Preserves archaeological sites, 185 km (115 miles) of the Yukon River, and the Charley River. Excellent canoeing country.
- **National Rivers-** Located largely within the boundaries of national parks, preserves and monuments. Only minimal development will be allowed along their banks. Includes: Alagnak, Alatna, Aniakchak, Charley, Chilikadrotna, John, Kobuk, Mulchatna, Noatak, Koyukuk (North Fork), Salmon, Tinayguk, and Tlikakila.

Where are the state parks in Alaska?

Alaska has more than 100 state parks. The parks extend from the rain forests of Southeast Alaska to the birch forests of the interior. Wood-Tikchik State Park, Alaska's largest state park–and the largest state park in the United States–lies just north of Dillingham, 300 miles west of Anchorage. The Alaska State Park System is divided into Southeast and Northern Regions and Matanuska-Susitna/Copper Basin, Chugach/Southwest Areas.



Courtesy of National Park Service

How about the national wildlife areas in Alaska?

"There are approximately 77 million acres of National Wildlife Refuge lands in Alaska, administered by the U.S. Fish and Wildlife Service. (National wildlife refuge acreage in Alaska increased nearly fourfold with the signing of the Alaska D-2 lands bill–Alaska National Interest Lands Conservation Act– in December, 1980.) Wildlife refuges are designed to protect the habitats of representative populations of land and marine mammals, other marine animals and birds. The 16 refuges vary widely in size.

"Among the public recreational uses permitted within national wildlife refuges are sightseeing, nature observation and photography, sport hunting and fishing (under state law), boating, camping, hiking and picnicking. Trapping can be carried out under applicable state and federal laws. Commercial fishing, including use of motorized vehicles, is allowed." (The Alaska Almanac, p.121)

Where are our national marine refuge areas?

The Alaska Maritime National Wildlife Refuge consists of all the public lands in the coastal waters and adjacent seas of Alaska–more than 2,400 islands, headlands, rocks, islets, spires and reefs of the Alaskan coast. The refuge stretches from Cape Lisburne on the Chukchi Sea to the tip of the Aleutians and eastward to Forrester Island on the border of British Columbia.

Where are the federal wilderness areas in the state?

Alaska's wilderness areas lie in the national parks, national forests, and national wildlife refuges of the state. Each of these federal areas has sizeable areas of wilderness. For the exact status of each area of these agencies, contact the agency. According to THE ALASKA ALMANAC, wilderness allocations to different agencies in Alaska are:

Agency	Approximate Acreage
U.S.D.A. Forest Service	5,453,366
National Park Service	32,848,564
U.S.D.I. Fish and Wildlife Service	18,560,000

The **ALMANAC** continues:

"Wilderness, according to the Wilderness Act of 1964, is land sufficient in size to enable the operation of natural systems without undue influence from activities in surrounding areas and should be places in which people are visitors who do not remain. Alaska wilderness regulations follow the stipulations of the Wilderness Act as amended by the Alaska lands act. Specifically designed to allow for Alaska conditions, the rules are considerably more lenient about transportation access, human-made structures and use of mechanized vehicles. The primary objective of a wilderness area continues to be the maintenance of the wilderness character of the land. In Alaska wilderness areas, the following uses and activities are permitted:

- Fishing, hunting and trapping will continue on lands within the national forests, national wildlife refuges and national park preserves. National park wilderness does not allow sport hunting, or sport or commercial trapping.

- Subsistence uses, including hunting, fishing, trapping, berry gathering and use of timber for cabins and firewood will be permitted in wilderness areas by all agencies.

- Public recreation cabins in wilderness areas in national forests, national wildlife refuges and national park preserves will continue to be maintained and may be replaced. A limited number of new public cabins may be added if needed.

- Existing special use permits and leases on all national forest wilderness lands for cabins, homesites or similar structures will continue. Use of temporary campsites, shelters and other temporary facilities and equipment related to hunting and fishing on national forest lands will continue.

- Fish habitat enhancement programs, including construction of buildings, fish weirs, fishways, spawning channels and other accepted means of maintaining, enhancing, and rehabilitating fish stocks will be allowed in national forest wilderness areas. Reasonable access including use of motorized equipment will be permitted.

- Special use permits for guides and outfitters operating within wilderness areas in the national forests will be allowed to continue.

- Private, state and Native lands surrounded by wilderness areas will be guaranteed access through the wilderness area.

- Use of airplanes, motorboats and snow machines where *traditional* as a means of access into wilderness areas will be allowed to continue. " (Alaska Almanac, pp. 165-166)

What about Alaska's national forests?

There are two national forests in Alaska which contain approximately 23 million acres. The Tongass National Forest is in Southeast Alaska and the Chugach National Forest is in Southcentral Alaska. Approximately 4.5 million recreation visitor days (RVDs) are spent by resident and non-resident visitors enjoying the outdoor recreation places and attributes of these national forests. A recreation visitor day is a combination of visitor use resulting in a total of 12 hours. There are 28 developed campgrounds and 24 picnic areas, three visitor centers, 632 miles of hiking trails and 190 public recreation cabins, all available for outdoor use and enjoyment. Of 38 major attractions in Alaska, the first three receiving the most visitation were within the national forests of Alaska.

What about local recreational areas?

The first question one might ask concerning local recreational areas might be "just what are local recreational areas?" The U.S. government's *Standard Industrial Classification (SIC) Systems*, (1982) U.S. Department of Commerce lists the following enterprises for recreation and parks:

Aerial trams
Boat rentals
Cable lifts
Cave operation
Fishing piers and lakes
Horse shows
Hunting guides
Natural wonders, tourist attractions
Observation tower operation
Pack trains for amusement
Rental of rowboats and canoes
Rental of saddle horses
Reptile or animal exhibits, commercial
Riding stables
Scenic railroads for amusement
Shooting galleries
Skating instruction, ice or roller
Skating-rink operation, ice or roller
Ski instruction
Ski lifts, cable lifts, ski tows (operated separately from lodges)
Ski-rental concessions
Slot-car race tracks
Sporting-goods rental
Sports instructors, professional (for golf, skiing, swimming, etc.)
Sports professionals
Ticket-sales offices for sporting-events contracts
Tourist attractions, natural wonders (commercial)
Tourist guides
Yoga instruction
Zoological gardens, commercial

What a varied collection of definitions! It seems that just about anything that doesn't provide food and shelter is considered recreation! But think of all the private recreational facilities in Alaska–from Alaskaland in Fairbanks to the White Pass Railroad in Skagway, to the horse and carriages plying the streets in Juneau. Private recreation is a varied industry in Alaska, and it is getting more varied every day! In terms of city parks, Anchorage has 14,000 acres of municipal parks, ranging from the nearly 5,000-acre Far North Bicentennial Park to tiny spots of green wedged between city streets, like Mountain View's Orca Park. Anchorage alone has 173 parks. In municipal parks recreation ranges from kicking soccer balls around plastic cones to jogging, to playing basketball.

Where are Alaska's private recreation areas?

Private sports clubs, yacht clubs, tennis and other outdoor facilities are private recreational areas. The Lower 48, Europe and elsewhere might have private hunting preserves, catfish farms, or other recreation facilities. In Alaska, private campgrounds can be found near many urban areas. Other private outdoor recreation facilities include golf courses, horseback riding businesses, hot springs (Chena, Circle etc.), sportsmens clubs, and wilderness lodges. The latter categories are found in virtually any and all of the major wilderness destinations in the state.

Where are the national and state historic sites in the state?

National historic sites include the Sitka National Historical Park in Sitka and the Klondike Gold Rush National Historical Park in Skagway. The Sitka National Historical Park is the site of the 1804 fort and battle that marked the last major Tlingit Indian resistance to Russian colonization. Tlingit totem poles and crafts are exhibited. The Russian Bishop's House, built in 1842, is the oldest intact piece of Russian American architecture. The Klondike Gold Rush park includes historic buildings in Skagway and portions of the Chilkoot and White Pass trails, all prominent in the 1898 gold rush. Though not a national historic park, the Bering Land Bridge National Preserve contains paleontological and archaeological resources unmatched elsewhere.

Why are recreation and natural resources such hot issues in Alaska?

Recreation and natural resources in Alaska are very emotional issues. The designation of enormous areas as wildlife refuges, national parks, national monuments and wilderness areas greatly expanded the recreational lands in the U.S.A., but such designations initiated restrictions in many Alaskas. The D-2 lands issue in the state brought considerable distaste for the federal government and agencies assigned to manage these lands. Alaska is very wealthy in natural resources, from its molybdenum resources near Ketchikan to the great forests of Southeast to the Bradley Lake Hydroelectric project to the Red Dog mine, the state is a wealth of natural resources. Forces competing for these resources, battling with those who advocate "environmentalism"– who some say see the uses of these resources simply in terms of recreation, has marked the very emotional debate in the state–right up to the present time.

Understand the Importance of the Resource

Importance of Parks and Recreation Areas
Teacher Page

Competency: **Understand the importance of parks and recreation areas**

Tasks: Explain the importance of recreational opportunities in terms of:

a. scientific baseline
b. spiritual value
c. mental health
d. resources for the future
e. tourism
f. protecting lifestyles and heritage
g. physical health
h. artistic, literary, historical, and archaeological values
i. effects on the ecosystem
j. commercial enrichment
k. non-commercial enrichment
l. wilderness versus public access
m. leisure time use in the daily, weekly, monthly, and annual personal time budget
n. Identify major types of recreational setting including:
    a. national parks
    b. state parks
    c. refuges
    d. wilderness areas

Introduction

The field of outdoor recreation is one undergoing great change. Many of the hardships that pioneers strove to overcome–mountains and rivers and seas–are today seen as settings for sport. Alaska holds a good share of all the recreational lands in the United States. Many of these areas are undeveloped for recreation as yet. What is the importance of those areas? Why did Congress establish those outdoor settings? What are their values? Whatever Alaskans' positions on that designation may be, the fact will remain that Alaska has great outdoor recreation potential. Recognizing the importance of these parks and recreation areas may help Alaskans attain and maintain employment related to those areas.

Overview

With the increase in tourism in the state, employment in outdoor recreation has risen. Some employment relates directly to *promotion* of outdoor recreation. This employment lies in travel agencies, visitor services and sales related to recreation These people have a stake in promoting the importance of park and recreation resources. Others, who see these outdoor settings in more aesthetic terms, promote these settings as places for rejuvenation and renewal. Those who promote photographic tours or discovery tours might fall in this category. Understanding the impact of these park and recreation settings relates to employment in a number of areas.

Suggested Learning Activities

1. Brainstorm ways in which parks and recreation areas are of value to human beings.
2. Invite a variety of users of parks and recreational areas to class (scientists, hikers, Native spiritual leaders, youth leaders, outdoor guides, artists, historians, archaeologists, park managers) for a panel discussion of the values of wild areas for their interests/purposes. Identify conflicts in these interests/purposes and discuss how to resolve conflicts.
3. Visit a local park or recreation area to consider its potential importance to users. Find out from local managers the extent of this area's use by the public. How much additional use could it handle? Can a dollar value be assigned to the area?

4. Project Wild "Riparian Zone," page 181, describes a simulation game in which a wild area is threatened by development. Play this game as a class to identify conflicting values concerning the use of wild areas.

Resources

Alaska Public Lands Information Center, 250 Cushman St., Suite 1A, Fairbanks, AK 99701 (907) 451-7352. 605 W. 4th Avenue, Anchorage, AK 99501. 271-2737 and P.O. Box 359, Tok, AK 99780. 883-5667.

Alaska State Parks, Department of Natural Resources, Division of Parks & Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

National Park Service, 2525 Gambell St., Anchorage, AK 99503-2892 (907) 271-2643

U.S. Forest Service, Federal Building, P.O. Box 21628, Juneau, AK 99802. *Actively seeks qualified local employees. Forestry Sciences Library in Juneau holds extensive references on recreation topics.*

Books:

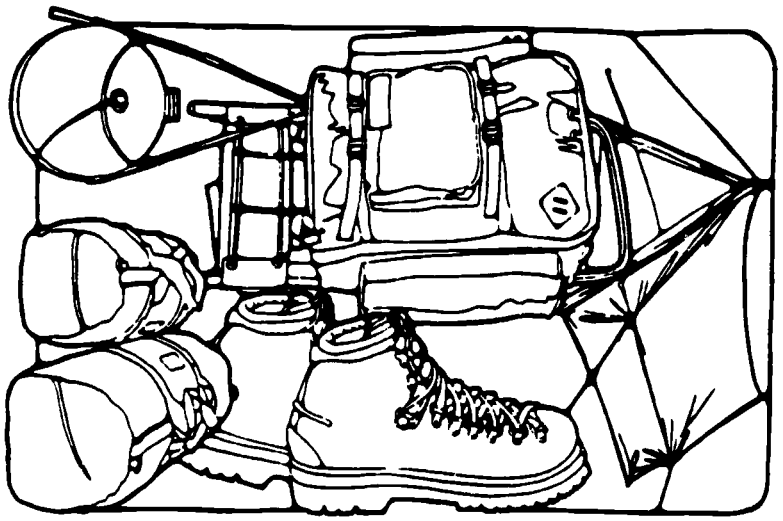
Venture Publishing, Inc., 1640 Oxford Circle, State College, PA 16803, (814) 234-4561. *This publisher specializes in textbooks for recreation and parks and leisure studies. Titles relating to this area include: Private And Commercial Recreation (1986). The Evolution Of Leisure: Historical And Philosophical Perspectives. Recreation Economic Decisions: Comparing Benefits And Costs. Recreation and Leisure: Issues in an Era of Change (1980).*

Importance of Parks and Recreation Areas

Why is recreation so important to Alaska?

Alaska holds a good share of the outdoor recreation lands in the U.S. Though estimates have shown that only five or seven percent of the population ever takes a wilderness backpack trip, some feel that many in the population consider outdoor settings somewhat like a public art gallery–created for the public good. Private businesses must consider cost-benefit ratios and profits, but most of Alaska's outdoor recreation resources are of the not-for-profit type. What is the inherent value of these outdoor settings?

First of all, outdoor recreation draws visitors. In fact when tourists were surveyed to find out their reasons for coming to the state, "wildlife" was listed as the primary one. Tourism is the second largest income producer in Alaska. Nearly one billion dollars is spent by the 800,000 travelers visiting Alaska. One in eight private sector jobs (12%) are directly provided by tourism. Nearly 19,000 full-time jobs are directly dependent upon this industry. Nearly 25% of all jobs in the private sector are supported by tourism which impacts 38,000 jobs in Alaska. Tourism is growing at a steady 5 to 7% per year in the state.



In addition to the economy, outdoor recreation settings have other values. Scientists and technicians say they have value as a scientific baseline. A baseline serves as a base for measurement or comparison. Humankind has altered the environment to such a degree, very few places remain untouched. Much remains to be learned about all the ways humans are altering the environment. Untrammeled outdoor settings provide areas against which to measure the impacts of development.

Many feel that natural outdoor settings have spiritual value. From a visit to a health spa to a hike in an Alaskan forest, many visitors feel a spiritual renewal from outdoor settings. Many outdoor settings, mountains, streams or lakes have spiritual value to Native Americans. In some settings, unlikely coalitions of groups are battling for local preservation because of spiritual values.

Some feel that outdoor recreation is valuable to mental health. Some programs bring disadvantaged and troubled youth to outdoor settings, either to test their mettle, or to isolate them from stresses.

For some, outdoor settings–parks and recreation resources–are important for recreation today. They're equally as important as a bank account of resources for the future. On rare occasions, even the strict protection of wilderness resources have been temporarily suspended during national emergencies, for example, the cutting of Sitka spruces in Washington's Olympic National Park for use as airplane struts during WW II.

Outdoor settings are valuable attractions for tourists. Alaska's most popular destination is Portage Glacier in the Chugach National Forest, near Anchorage. Another popular site is Denali National Park. Tourists do not visit that site for its amusement rides. Denali National Park holds spectacular displays of wildlife and scenery.

Some see outdoor recreation settings such as Alaska's state and national parks, national forests, fish and wildlife refuges and other state and federal land as important to protecting lifestyles and heritage. Those lifestyles might include subsistence, self-sufficiency, trapping, dog-mushing and other traditional uses. Technology and development can affect those lifestyles.

Outdoor recreation benefits physical health. Hiking, backpacking, canoeing, kayaking, and other physically intense sports build cardiovascular systems.

Other values of recreation settings include artistic, literary, historical and archaeological values. Artists often choose open spaces and natural settings as places to paint, sketch or photograph. Writers may pick similar places to write, or find outdoor settings inspiring places in which to write. Such outdoor settings also provide important places to write *about*, as parks, refuges and other settings for outdoor adventure provide the stuff for numerous magazines and booklets. Historical values are often met by outdoor settings. Many parks and monuments are set aside solely for their historical value, for example Klondike National Historic Park at Skagway, Alaska, or the House of Wickersham in Juneau. Some outdoor settings are reserved for multiple uses, such as the national forests. These areas are protected for recreation, logging, mineral extraction, and habitat preservation. U.S. Fish and Wildlife Refuges also allow some multiple uses, but with special protection for fish and wildlife resources.

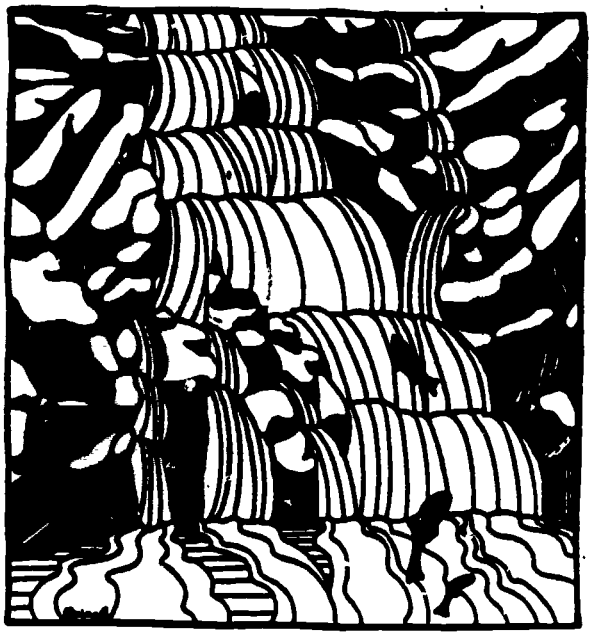
Finally, some outdoor settings are valued for their archaeological values. In fact, assessment of archaeological sites is a standard part of changes in land designation today. Before the trans-Alaska pipeline was built in the BLM corridor, for example, archaeologists explored the entire length to assess what sites might be disturbed by construction. Largely for its archaeological values, Cape Krusenstern was designated the "Bering Land Bridge National Monument" as part of Alaska National Interest Lands Conservation Act (ANILCA) in 1980.

Some value outdoor settings for their values in protecting ecosystems. Ecosystems are interrelated life systems. Parks, refuges and other outdoor settings are often set aside partly for this reason. Sometimes boundaries for these areas are drawn with those ecosystems in mind.

Outdoor settings can have value for commercial enrichment. Parks, refuges, wild and scenic rivers, canyons, raft trips, famous natural phenomenon can have an entire commercial economy build around them. Yosemite National Park in California is a prime example. Denali National Park in Alaska is another. Many believe that Alaska's other sizeable park and recreation areas have the economic potential of areas elsewhere, that indeed some day thousands upon thousands will want to visit Wrangell St. Elias National Park near Glennallen or Wood-Tikchik State Park, near Dillingham. It seems hard to believe today, but the same was thought of Yellowstone National Park less than a century ago. Other enriching values of outdoor settings might be thought of as non-commercial enrichment–that is protection of an area for its cultural values. One mountain near Pokhara in Nepal, for example, is forbidden for mountain climbers by decree of the king. The mountain has religious value in Nepali culture. An ongoing debate in Alaska is that of wilderness versus public access. Large areas, far from roads and without airstrips have wilderness protection. Some Alaskans ask "are too many lands locked up?" "Why protect areas that only the rich and healthy can afford to visit?" Others see these wilderness areas as necessary either as "safety valves" for some to get away, as worthy of protection whether people visit them or not, or as "banks of diversity" of plants and animals for future use, scientific study, or protection of the planet. Others see protected outdoor settings as important for leisure activities, a place to "get away from it all." Such areas are all to uncommon in developed areas of the world.

What are the major types of recreational settings?

There are a number of types of recreational settings. Alaska is well-represented with many types of recreational settings. The state holds 60 % of the acreage of the entire national park service. The state park system is growing: currently the state park system contains more than 100 state park units. Large parts of the two national forests are designated wilderness, as are parts of the U.S. Fish and Wildlife system. Other recreational settings include greenbelts, bike paths, playing fields, city parks, swimming areas, roadside rests, and trails. Nearly every Alaskan uses recreational settings in some form or manner, whether directly by hiking a trail, or indirectly, by driving through a park. Recreational settings have continuing importance in a state with a fast-growing visitor industry.



Predicting Trends in Site Use
Teacher Page

Competency: **Predict trends in recreation site use**

Tasks: Estimate future population trends in recreation in Alaska
Estimate future trends in use of leisure time for Americans
Explain future demands on recreational use of natural resources in Alaska and ways to deal with such demands

Introduction

Professional planning is a viable profession. During the boom times in Alaska, professional planners had a surge of employment. Universities have resource management and land use departments. The society is becoming more sophisticated about planning before acting. Alaska, with a good share of the undeveloped land in the United States and with a good share of the outdoor recreation lands, has a role for the professional planner.

Overview

Some jobs exist in predicting trends in site use. Virtually every city in the state has someone considering outdoor recreation needs. All agencies, federal and state have planners predicting use. Though these planning jobs are not in the technician category, at some point virtually all working in outdoor recreation are somewhat involved in predicting site use. Some familiarity with such predictions is useful. Those specifically dealing with recreation issues include biologists and resource managers, recreation directors and supervisors, park rangers, and urban and regional planners. When biologists, resource managers, park rangers and others deal specifically with recreation issues, they are doing the work of the planner. The "Alaska Career Guide" says that planners "study how land currently in use could be improved, and propose ways to develop unused land and ensure that it meets future needs. ...Employers state the most desirable master's degree is in planning, but degrees in public administration and business are also good. A bachelor's degree in city planning, land resource management, architecture, or engineering may qualify for some entry positions. A background in fisheries or oil industry economics is advantageous." Suggested courses include advanced math, chemistry, oral and written communication, sociology, history, geography and drafting. Salaries can be high: $2,900 to $5,000 per month, with 250 employed statewide.

Suggested Learning Activities

1. Invite a professional planner with experience in parks and recreation to class to discuss present and future trends in recreation, use of leisure time, and demands on recreational use of natural resources. How will agencies deal with future demands on the resources?
2. Research recreational use of parks in the Lower 48. What measures are in use to limit the impact of recreational use on park resources? What measures might we begin to use in Alaska for the same purpose?

Resources

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Books:

Outdoor Recreation Management, Alan Jubenville, Philadelphia, Saunders Publishing, 1978.

Outdoor Recreation Planning, Alan Jubenville, Philadelphia, Saunders Publishing, 1976.

Participation Preferences And Characteristics Of Outlying Cabin Users In Alaska National Forests , Alan Jubenville, Fairbanks Alaska Agricultural Experiment Station, School Of Agriculture And Land Resources Management, University Of Alaska 1980 .

Venture Publishing, Inc., 1640 Oxford Circle, State College, PA 16803, (814) 234-4561. *This publisher specializes in textbooks for recreation and parks and leisure studies. Titles include Private And Commercial Recreation (1986), The Evolution Of Leisure: Historical And Philosophical Perspectives, Recreation Economic Decisions: Comparing Benefits And Costs, etc.*

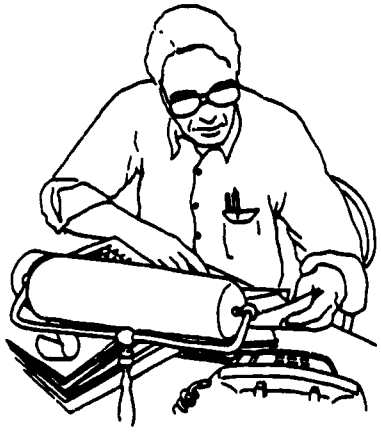
Predicting Trends in Site Use

Is recreation in Alaska going to continue to expand?

When Alaska became part of the U.S. in 1959, it was the smallest state in population. The state continued in that role until the mid-1980s when it became the second least populated–behind Wyoming. Estimates are that by the turn of the century and into the 21st century, Alaska will grow in population, but remain in the five least populated of the states.

As recreation is an "extra" in life, it is especially dependent on the economy. When the U.S. dollar can buy fewer goods overseas for the same money, it is termed "weak." A weak dollar keeps more Americans home, traveling in the U.S. The weak dollar also makes the U.S. more attractive for foreign tourists, as their francs, deutschemarks or pounds buy more for the same money. Alaska's outdoor settings offer something unique not only to Japanese, Taiwanese and Korean tourists, but to Europeans as well. Alaska's location, halfway between the Orient and Europe (flying over the North Pole) makes it an ideal tourist destination for both groups. What sizeable numbers of affluent tourists those groups represent! In 1987, 5,000 tourists, most of them Japanese, visited Alaska. In 1988 8,000 to 10,000 Japanese were expected. Factors such as Europe-Japan flights fueling daily in Anchorage will encourage the passengers to stopover in the state, increasing recreational visitation.

As the Division of Parks and Outdoor Recreation states, "in-state expenditures by out-of-state visitors totaled about $800 million and created about 16,000 jobs or 10% of the Alaska work force. An examination of future employment in renewable resource fields by the Institute of Social and Economic Research predicted that two-thirds of the new jobs expected to be created by the year 2010 will be in the tourism-recreation industry." (Outdoor Recreation: Alaska, p. 123)



Are Americans spending more time in leisure activities?

Arlin Epperson notes in *Private and Commercial Recreation* that *U.S. News and World Report* estimates of expenditures on leisure over the past 20 years (1977, 1978, 1979, 1980, 1981, 1982, 1983) show:

Year	Expenditure
1965	58 Billion
1977	160 Billion
1980	218 Billion
1981	244 Billion
1982	262 Billion
1985	300 Billion

Epperson states that "leisure appears to be our nation's largest industry, as measured by people's spending. It exceeds the national expenditure for defense by over one hundred billion, along with every other expense except perhaps education and food." (pp. 38-39) As Epperson notes, this industry probably includes vacation homes, video games and some computer games. Nonetheless, the leisure industry is gigantic in size. Alaska has the potential to feature largely Americans' use of leisure time.

However, is outdoor recreation *necessary?* Can't we get along without the types of outdoor activities a state like Alaska offers? There are large areas on the earth where the types of wilderness activities Alaska's outdoor settings offer are simply not available. To the more than half a billion people in Europe, Alaska's remote outdoor settings offer something they could only dream of at home. Many urban dwellers around the world could scarcely imagine places far from human bustle. One could say that outdoor recreation is as necessary as any other endeavor which contributes greatly to mental and physical health.

If more and more people want to use outdoor resources, what is going to happen?

It's hard to imagine that Alaska's vast recreational lands could ever be overrun, but it is valuable to note that when Yellowstone was made a national park in 1872, people asked who would ever visit such a remote place. The unexpected can certainly occur. In the Lower '48, many of America's national parks and forests are virtually loved to death. Some recreation areas in the Lower '48 restrict visitation to protect the resource. The United States supports 250 million large mammals (humans). Supplying the needs of all those people puts real demands on resources and those people put real demands on recreation facilities. Epperson in *Private and Commercial Recreation* states that "while personal expenditures for specific types of recreation may rise or fall, the long-term trend in recreation and leisure will be up. Suffice it to say here that, barring a significant change in any of the following, expenditures for leisure and recreation will continue to grow at a faster rate than in any other area of our economy, though perhaps not to the levels seen in the 1970s:

–availability of energy
–foreign policy (war)
–price controls
–a recession

The outlook for the recreation business is excellent." (Private and Commercial Recreation, P. 43)

Understand Competing Uses

Controversies Related to Parks and Recreational Land Use in Alaska
Teacher Page

Competency: **Understand controversies related to parks and recreation land use in Alaska**

Tasks:
Compare and contrast public and private management and regulation of recreational settings
Define the D2 clause of ANCSA
Explain several sides of the parks and land use issue
Explain issues concerning mining in recreation settings
Explain the use of ATVs and aircraft for self-sufficiency
Explain the issue of:
a. Self-sufficiency hunting, trapping, and fishing in recreation settings
b. Sports hunting in parks and recreation areas
c. Designating Native allotment lands in parks and recreation areas
d. Sports versus commercial fishing in parks and recreation areas
e. Wilderness versus multiple use in parks and recreation areas

Introduction

Any sourdough can tell you that parks and recreation land use in Alaska has been a controversial topic. In order to build the pipeline, a settlement had to be made with Alaska Natives. In order to settle with Alaska Natives, the federal government selected what would become *National Interest Lands.* These federal lands, under the Alaska National Interest Lands Conservation Act (ANILCA) added vast areas to the National Wildlife Refuge system, the National Park system, the Bureau of Land Management conservation and recreation areas, National Wild and Scenic Rivers, and wilderness and monument designations within the National Forests in the state. Alaska has a good share of the outdoor recreation lands in the United States.

Overview

It's hard to imagine that there are jobs related to controversy, but think about those advocate agencies and organizations on either side of the recreation issue. All of them have employees! There are all kinds of agencies, from *The Alaska Center for the Environment* to the *Wilderness Society.* Many of them hire and field volunteers. Some of these agencies involved in controversy and litigation *themselves* provide work in outdoor recreation. On the sportsmen's side of the recreation coin, there are diverse groups ranging from the *Alaska Alpine Rescue Group* to *Yukon Quest International, Ltd,* offering plenty of experience to members and in some cases, employment. All such groups may offer experience which can *lead* to employment, either directly or indirectly, in outdoor recreation.

Suggested Learning Activities

1. Invite public and private land managers to class to discuss the management and regulation of recreational settings. Ask what conflicts have arisen concerning recreational and other uses of public and private lands.
2. Research the D-2 clause of ANCSA to find out why it was so controversial for the U.S. Government to propose expanding parks and wilderness areas in Alaska back in 1977. Conduct a role play of Senator Seiberling's subcommittee hearings in your town, with some students playing Representative Don Young and other congressmen; other students can play local citizens with varying opinions and positions regarding how the D-2 lands should have been used.
3. Correspond with representatives of different interest groups about their positions concerning a parks and rec-related land use issue. Project Wild, "Philosophical Differences," page 39, describes such an activity in depth.

4. Invite local miners, loggers, land use managers, and recreational users of a local wild area to class to discuss/debate most appropriate uses of the resources in the area.Research and debate the appropriateness of ATV's and aircraft used for self-sufficiency in Alaska's recreational areas.
5. Invite local Native leaders to class to discuss what they feel are the most appropriate uses of Native and federal land holdings in Alaska.

Resources

Alaska Public Lands Information Centers, 605 West 4th Avenue, Suite 105, Anchorage, AK 99501; 250 Cushman Street, Suite 1A, Fairbanks, AK 99701; and P.O. Box 359, Tok, AK 99780

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

Citizens' Advisory Commission on Federal Areas, 515 7th, Suite 310, Fairbanks, AK 99701. *Agency researches issues related to federal lands in Alaska. Investigates complaints or problems individuals have with federal land management agencies.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, Ketchikan Area, Federal Building, Ketchikan, AK 99901, Stikine Area, P.O. Box 309, Petersburg, AK 99833, Chatham Area, 204 Siginaka Way, Sitka, AK 99835. *Actively seeks qualified local employees. Forestry Sciences Library in Juneau holds extensive references on recreation topics.*

Video:

"Alaskan River," 30 minute VHS video, 1983. *Available from the Alaska State Library or KYUK, Pouch 468, Bethel, AK 99559. Discusses the possible stress on an Alaskan river brought about my recreational use and by the threat of economic development.*

Participation Preferences And Characteristics Of Outlying Cabin Users In Alaska National Forests, Alan Jubenville, Fairbanks Alaska Agricultural Experiment Station, School Of Agriculture And Land Resources Management, University Of Alaska 1980 .

Controversies Related to Parks and Recreational Land Use in Alaska

Are there private recreational settings?

Sure there are. Perhaps you belong to a trap and skeet club or you've golfed on a private golf course. Maybe you have hiked on land someone keeps wild just for their own satisfaction. In fact our current idea of state and national parks derives from the private hunting preserves of European nobility. In the Lower 48, logging companies use great tracts of land as tree farms, growing the renewable timber resource. Recreational users such as hunters, fishermen, hikers or backpackers often use these lands. In the Lower 48 these lands offer many recreational opportunities. Alaska Native and village corporations manage 44 million acres in the state. Native lands represent some prime wildlife habitat. They also have great potential for the recreational user.

Yet, what private corporations, what private landholders can afford to hold land solely for recreational users? And who would maintain docks, trails, cabins, and bridges? Using private land for personal recreation is asking a lot of the owner. Nearly everyone agrees that it is the job of the government to create and maintain *public* park and recreation areas.

What was the D-2 clause of ANCSA?

In the 1960s a major oil discovery was made on Alaska's North Slope. To build the Trans-Alaska pipeline, the issue of Native land claims needed to be settled. The Alaska Native Claims Settlement Act (ANCSA) returned 44 million acres and brought a cash settlement to Alaska's Natives. That act established Alaska's Native and village corporations. The D-2 clause of that act established new parks, monuments, wildlife areas, and wilderness areas in Alaska–massive new land designations for–among others–recreational users.

The D-2 lands act of the Alaska Native Claims Settlement Act (ANCSA) (called the Alaska National Interest Lands Conservation Act–ANILCA) created ten new National Park Service units in Alaska and changed the size and status of the three existing park service units: Mount McKinley National Park, now Denali National Park and Preserve; Glacier Bay National Monument, now a national park and preserve; and Katmai National Monument, now a national park and preserve. D-2 also doubled the size of the National Wildlife Refuge System. It also protected 25 free-flowing Alaska rivers in their natural state, almost doubling the size of the National Wild and Scenic River system and classified 56 million acres in the above designations as wilderness, tripling the size of the National Wilderness Preservation System. In other words, D-2 placed nearly a fourth of Alaska's territory in parks, refuges, or other restricted designations.

Were there several sides to the Alaska parks and land use issue?

Look at the idea of setting aside large areas of the state from one perspective: history had shown that if lands are not preserved *before* they're developed, the steam roller of progress will extend to even the most remote areas. In fact, when Yellowstone National Park was created in 1872, some claimed that it was too remote for visitors, too rugged for development. Those familiar with that Wyoming destination know that today the park receives millions of visitors every summer, experiences urban problems like traffic jams and air pollution, and feels civilization and development encroaching right to its very boundaries.

On the other hand, Alaska was doing fine *before* they declared the new national parks, wasn't it? Hadn't Alaska managed its land successfully on its own without the intrusion of the federal government? Wasn't the declaration of 50 *million* acres of the state's land as national parks an invasion of the state's sovereignty? Such are two of the several arguments which came out of the legislation of the 1970s and 80s. Do you know others?

What are some issues concerning mining in recreation settings?

When National Parks were set aside in Alaska, some of the parks and preserves contained mining claims. Some of the properties contained active mines. National Park designation in the Lower 48 includes some of the tightest zoning in the world. For example, those who own property and cabins surrounded by parks such as Great Smoky Mountains National Park have to get permission to paint their own cabins. Many Americans consider national parks *their* national treasure. Mining in the parks has great potential for conflict.

Do people use ATVs and aircraft for self-sufficiency in Alaska's recreation areas?

That depends. Regulations vary, but in general, in Alaska's National Parks, aircraft may not be used for subsistence purposes. The use of ATVs varies with the park. In some cases, ATVs can be used to access fish and game. In others, ATVs are restricted to certain zones. For example, Gates of the Arctic National Park has corridors through the park and preserve which lead from the village of Anaktuvuk Pass. Some of these restrictions are controve sial and many are still being formulated. Managers are still discussing which areas of forests, parks and wildlife areas in the state should be declared wilderness.

What about some other issues related to recreational settings in Alaska?

Everybody wants the same lands, or so it seems. Ask someone who hunts, fishes or traps Alaska's lands. The backpackers seem to claim the same places. "Those trappers act like they own this place," you may hear some recreational user say. "Things were fine here until they came in and starting telling us what to do," you might hear the trapper respond.

Only in Alaska is hunting allowed in national parks–subsistence hunting for *local rural residents*. Many new park areas in Alaska were designated *National Preserves*. These areas, under the auspices of the National Park Service, allow subsistence *and* sports hunting uses. Hunting within the historic park boundaries (pre-D2–Katmai, Glacier Bay and Denali) is prohibited. Subsistence hunting in the new national parks is allowed for *local rural residents*. Sound confusing? It is! Many state parks allow hunting. In these respects, Alaska's state and national parks differ greatly from those in the lower '48. For this reason, a good deal of discussion continues around the definition of state and national park areas in the state. Does the National Park Service eventually plan to eliminate all hunting on its massive holdings? Does the state park system plan to follow suit, to have the type of restrictive regulations found elsewhere?

In some cases, Native allotments have been established on these park and recreation lands. Typically, more than one person or group is interested in the same lands. Some recreation users begrudge allotment parcels on prime recreation lands. A number of issues remain in regards to Alaska's outdoor recreation resources. These issues include: subsistence hunting, trapping, and fishing in recreation settings, that is hunting, fishing and trapping in parks. Another issue includes hunting in parks and preserves. The designation of Native allotments in parks and refuges is still another issue, as is sports versus commercial fishing in these areas, such as Glacier Bay National Park. A final issue of controversy in Alaska's outdoor recreation areas might be that of wilderness versus multiple use. Such controversies are especially felt on National Forest Service lands, where the mandate is "multiple use." Multiple use means that these public lands are meant for logging, mining, habitat preservation, and for wildlife as well as for recreation.

Instructional Materials for Wildlife Management

Work with the Resource

Employment in Wildlife Management

Teacher Page

Competency: **Identify wildlife employment and educational opportunities**

Tasks:

Identify educational and occupational opportunities
Locate resources for finding employment
Confer with prospective employers
Identify the work of:

a. biology technician
b. biometrician
c. clerk selling firearms
d. clerk selling fishing and hunting equip.
e. equipment and facility maintenance person
f. fish and game biologist
g. fish and wildlife enhancement tech.
h. fish and wildlife Protection Officer
i. fish and wildlife Service Officer
k. fish and wildlife technician
j. hunting guide
l. fishing guide
m. lab technician
n. meat-cutter for wild game
o. park ranger
p. park technician
q. taxidermist
r. trapper
s. wildlife management aide
t. wildlife mgt maintenance worker
u. wildlife photographer

Introduction

Working in wildlife in the United States is usually not financially rewarding. Students interested in this vocational area are often motivated by a great interest in wildlife and in the outdoors. The attractiveness of a job in the wildlife area is the advantage of outdoor work with living things.

Overview

Finding employment in the wildlife field is a real challenge. Strong competition exists for many of the jobs in this area. Many of the jobs related to wildlife involve protection of habitat and facilities.

Suggested Learning Activities

1. Brainstorm jobs related to wildlife.
2. Interview people working in positions listed above. Find out about their previous training, their responsibilities on the job, and their skills.
3. Write and publish a handbook describing these positions so that other students will know more about them.
4. Invite people working in wildlife-related positions to class to discuss their work and previous training.
5. Write to personnel officers of agencies to talk to class about opportunities and prerequisite skills.
6. Project Wild, "Which Niche?" ("Students compare ecological niches with careers"), page 151; "Wildwork," ("Students research and report on potential careers" in wildlife), page 153; "The Hunters," (Students read and discuss a story, describe their feelings about hunting, compare attitudes to those of other people, make personal judgements about the appropriateness of hunting"), page 157; "Checks and Balances"("Students become managers of a herd of animals, evaluate hypothetical wildlife management decisions, and identify factors which can affect the size of a wildlife population"), page 223; "Pro and Con: Consumptive and Non-Consumptive Uses of Wildlife"("Students research and debate" uses of wildlife), page 33; "A History of Wildlife Management"" (Students contact wildlife managers for information about trends and philosophies in management), page 155; "Philosophical Differences" (Students write to various interest groups about

philosophies on wildlife, natural resources), page 39; "Deer Crossing" (Students discuss and evaluate a specific wildlife issue)) page 183; "Who Pays for What?" (Students investigate success of funding for wildlife research), page 191; "Changing Attitudes" (Students conduct community interviews to determine public attitudes and a change in attitude related to a wild animal), page 165; "Ethi-Reasoning" (Students evaluate and discuss hypothetical dilemmas related to wildlife), page 197.

Resources

Alaska Career Guide, available from Office of Adult and Vocational Education, Alaska Department of Education, Box F, Juneau, AK 99811. *Also available at extension offices.*

Alaska Natural Resource and Outdoor Education Association (ANROE), P.O. Box 110536, Anchorage, AK 99511-00536. *Association of educators interested in and promoting natural history and wildlife education.*

Alaska Natural History Association (ANHA), c/o National Park Service, 2525 Gambell St., Anchorage, AK 99503. *Publishes books and distributes information on a variety of natural history, parks and recreation topics. Write for information. Their publications are available at Alaska Public Lands Information Centers in Anchorage, Fairbanks, Tok, and (soon to be) Ketchikan.*

Resources

"Alaska Fish & Game," P.O. Box 3-2000, Juneau, AK 99802-2000. *Monthly magazine of the Alaska Department of Fish and Game.*

Boy Scouts of America, Direct Mail Division, P.O. Box 909 Pineville, NC 28134-0909. *The Merit Badge Library offers publications specific to many areas related to wildlife. Sample topics include Backpacking, Camping, Environmental Science, Fish and Wildlife Management, General Science, Insect Study, Plant Science and Veterinary Science. Write for complete list. Booklets $1.25 each. Also, the Fieldbook is an excellent resource.*

Employment in Wildlife Management

What are some educational and job opportunities in wildlife?

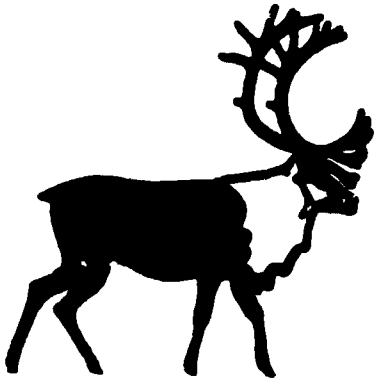
The Alaska Department of Fish and Game, Alaska Division of State Parks, city and borough governments, U.S. Fish and Wildlife Service, U.S. National Park Service, Bureau of Land Management, U.S. Forest Service, and Native corporations all might have jobs dealing with wildlife. The 1987 Alaska Career Guide lists the following jobs in the wildlife field:

Fish and Wildlife Technicians: Perform technical tasks in the study and protection of fish and wildlife. Collect and record data on the distribution and number of fish and wildlife including egg counts, weight-length measurements, tagging, and aerial surveys. May work in a laboratory or at a remote field site. Opportunity limited, 200 employed at a salary of $1,900 to $2,600 monthly. Suggested training includes vocational training and an associate degree with courses in advanced math, biology, chemistry, physics, physical science, oral and written communications and agriculture. Related jobs include forestry technicians, biologists, and aquaculture. The intense competition for most openings results in most successful applicants having at least a 2-year degree in fisheries or wildlife technology or comparable experience. [Many people have full four-year degrees and use the technician series as a means to gain further field experience before advancing further in their professional career.]

Fish and Game Protection Officers: Enforce laws and regulations designed to protect and conserve fish and wildlife. Warn, cite, or arrest individuals suspected of violations. May seize the fish, game, and equipment connected with the violation. Collect information on the condition and numbers of fish and wildlife in the area. Patrol by boat, plane or foot. Opportunity limited, 150 employed at a salary of $1,900-$3,400 monthly. Applicants need an associate or college degree with courses in basic math, biology, oral and written communications, psychology, sociology, general shop/mechanics and physical education. Related jobs include park rangers and fish and wildlife technicians. To compete for state and federal jobs, applicants must have some experience in law enforcement or college education and be on the appropriate registers. All people

currently being hired have several years of law enforcement experience. An associate or bachelor's degree in biology, wildlife, or conservation is helpful. Must meet strict physical requirements and background check for fitness of character.

Other related jobs include fish and wildlife aide, park technician, park ranger and tourist guide.

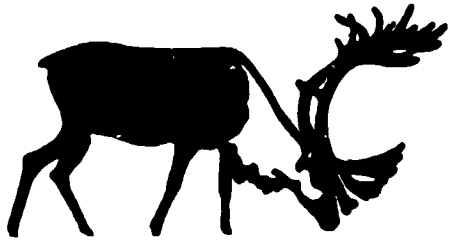


How do I find a job in wildlife?

You can write directly to agencies and they will tell you how to get such jobs. Ask the counselor at your school or college. Do a little bit of old fashioned shopping around. Pick a place which pursues the type of work that interests you. Find the address, and write a letter asking the type of education and experience they require. Those who already work in the field are best prepared to tell you how to get such a job yourself.

With whom can I talk about working in the field of wildlife?

Start by talking with someone who already works in the field! That's one of the best ways to find out what's needed to break in, to set yourself up to get what you want. You can ask about schools which have programs in wildlife, and which ones offer other instruction in natural resources. Talk to personnel officers of natural resources agencies for the state or federal government to find out more about those schools. Those personnel officers can tell you where to find out the skills and requirements for employment or can direct you to someone already working in the area in which you are interested in working.



What are some other jobs I could get?

A number of jobs are related to wildlife. It's obvious that a biology technician has a job related to wildlife, and so does a Fish and Wildlife Protection officer. But what about the maintenance worker at a National Wildlife Refuge, or a taxidermist? The following jobs are directly or indirectly related to wildlife:

a. biology technician
b. biometrician
c. clerk selling firearms
d. clerk selling fishing and hunting equip.
e. equipment and facility maintenance person
f. fish and game biologist
g. fish and wildlife enhancement tech.
h. Fish and Wildlife Protection Officer
i. Fish and Wildlife Service Officer
k. fish and wildlife technician
j. hunting guide
l. fishing guide
m. lab technician
n. meat-cutter for wild game
o. park ranger
p. park technician
q. taxidermist
r. trapper
s. wildlife management aide
t. wildlife mgt maintenance worker
u. wildlife photographer

A number of jobs in the tourist industry are also related to wildlife. You might work as an outfitter, flying amateur photographers into a remote lake to take wildlife photos. You might be a tour driver in Denali Park, stopping the bus and explaining some natural history to your clients. A knowledge of wildlife will benefit you in jobs related both to the resource management end of wildlife and to the business of guiding clients and visitors.

Use the Resource

Firearms
Teacher Page

Competency: **Use a firearm**

Tasks:
Demonstrate firearm safety
Use a shotgun
Use a high-powered rifle
Use a handgun
Clean firearms

Introduction

Probably no other nation on earth has the access or the preponderance of firearms as does the United States. The right to bear arms is of course written right into the Bill of Rights: "Amendment II, Right to keep and bear arms. A well-regulated militia, being necessary to the security of a free State, the right of the people to keep and bear arms, shall not be infringed." In the field of wildlife firearms are important for hunters, for law enforcement officers and for wildlife protection.

Overview

Nearly every community in the state of Alaska offers employment dealing with firearms. While the state has little if any manufacturing of firearms, there is considerable employment in firearm repair and sales. There are many jobs associated with the sales of ammunition, guns, and sports outfitting in Alaska where hunting and firearms are big businesses. A knowledge of types of firearms as well as firearm safety could improve potential employability in associated areas.

Suggested Learning Activities

1. Disassemble , clean, and reassemble a shotgun, rifle, and handgun.
2. Role play firearm safety measures.
3. Take a field trip to an approved local shooting range. Practice firing, using safety measures.
4. Invite representative from NRA to discuss firearm safety, appropriate use of different kinds of guns.
5. Project Wild. "The Hunters," (Students read and discuss a story, describe their feelings about hunting, compare attitudes to those of other people, make personal judgements about the appropriateness of hunting"), page 157; "Checks and Balances"("Students become managers of a herd of animals, evaluate hypothetical wildlife management decisions, and identify factors which can affect the size of a wildlife population"), page 223; "Pro and Con: Consumptive and Non-Consumptive Uses of Wildlife"("Students research and debate" uses of wildlife), page 33; "A History of Wildlife Management"" (Students contact wildlife managers for information about trends and philosophies in management), page 155; "Philosophical Differences" (Students write to various interest groups about philosophies on wildlife, natural resources), page 39; "Deer Crossing" (Students discuss and evaluate a specific wildlife issue)) page 183; "Who Pays for What?" (Students investigate sources of funding for wildlife research), page 191; "Changing Attitudes" (Students conduct community interviews to determine public attitudes and a change in attitude related to a wild animal), page 165; "Ethi-Reasoning" (Students evaluate and discuss hypothetical dilemmas related to wildlife), page 197.

Resources

Alaska Big Game Handgunners Association, Box 1735, Wrangell, AK 99929

Alaska Big Game Trophy Club, 109 West 6th St., Anchorage, AK 99504

Hunter Education Coordinator, Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, AK 99518. *Contact coordinator for time and location of "Hunter Education Course" offered near you.*

McKinley MountainMen Muzzleloading Rifle Club, Box 212584 Anchorage, AK 99521-2584 (907) 562-2703 or 278-3514

National Rifle Association, 1600 Rhode Island Avenue, N.W., Washington, DC 20036

Books:

Basic Hunter's Guide, National Rifle Association Sales Department, P.O. Box 96031, Washington, DC 20090-6031. *An excellent authoritative beginning guide to firearms and hunting. $8.95 for single copies. less for quantity. Quotations used by permission National Rifle Association.*

Firearms

Why is firearms safety so important?

Guns can hurt, maim, or kill you.

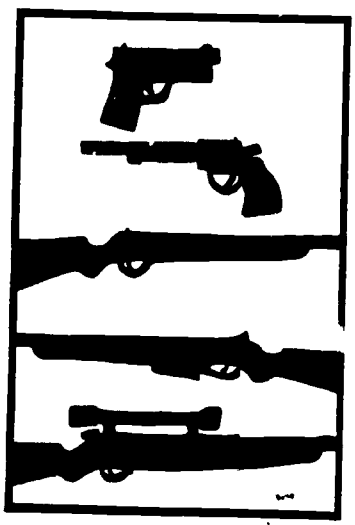
The National Rifle Association lists these ten *Gun Safety Rules:*

1. *Always point the muzzle in a safe direction.*
2. *Keep the action open and gun unloaded until ready to shoot.*
3. *Keep the action open and gun unloaded until ready to use.*
4. *Know how the gun operates.*
5. *Be sure your gun and ammunition are compatible.*
6. *Carry only one gauge/caliber of ammunition when shooting.*
7. *Be sure of your target–and what's beyond.*
8. *Wear eye and ear protection as appropriate.*
9. *Don't mix alcohol or drugs with shooting.*
10. *Be aware that circumstances may require additional rules unique to a particular situation. You are responsible for gun safety.*

What are some tips on using the shotgun?

As John Seymour noted in *The Guide to Self-Sufficiency*, "A shotgun is a smooth bore tube which fires a charge of shot. Shot consists of lead pellets. These are traditionally made by pouring molten lead through a sieve at the top of a tall tower. The molten droplets fall, become quite spherical in their descent, solidify in the air, and land in water at the bottom so that they are not disfigured. They are then graded in screens for size. The sizes are numbered according to what number of shot make up an ounce (28 g): thus no. 1 shot is very big, no. 3 is about right for wild geese, no. 5 for duck, no. 6 for pheasants, rabbits and small game, and nos. 8 or 9 for smaller birds.

"Shotguns are graded according to the size of their bore (size of their barrel). The bore depends on the number of lead balls in a pound (0.5 kg) that exactly fit a barrel. Thus the barrel of a twelve bore takes twelve balls to fit it, making up a pound. The twelve bore is by far the commonest size all over the world now and is a good all-purpose gun. Sixteen and twenty bores are sometimes found: they hit as hard as a twelve but have a smaller 'pattern' (area covered by the shot at a given distance from the barrel. They are light and handy but to use one well you must be a good shot. The 'four-ten' (.410 inch) is commonly used [to initiate young shooters]. Ten and eight bores are heavy guns for hunting wild fowl, particularly geese and wild duck. The old four bore, almost extinct now, is a very heavy gun indeed, used for firing at mobs of birds. The giant 'punt guns' were even larger.



Courtesy of the National Rifle Association

"There is an almost overwhelming selection of guns available, but the pump action, semi-automatics, or fully self-loading automatics are the usual. It is all a matter of what people think is 'sporting.' Cartridges are loaded with nitro-powder which is smokeless and reliable, but some people load their own brass-cased cartridges (with an apparatus bought from a gun shop) and thus save a lot of money. Modern cartridges are fired by a percussion cap (small brass cap containing fulminate of mercury) pressed into the base of the cartridge." (The Guide to Self-Sufficiency, p. 198)

Any hunter can tell you the power of a shotgun. It shoots pellets in a pattern or shoots a slug. Its large bore allows for maximum wallop. It is the weapon of choice for law enforcement. A shotgun demands respect. Unlike the high-powered rifle, shotgun shells usually do not propel a single projectile. The shotgun can cause damage over a wide area. So you need to pay special attention to what is *around* what you're shooting at. Never point a shotgun or any other gun at a human being. Also be aware that the range of the shotgun is less than that of the rifle. The kick of a shotgun has the power to painfully bruise your shoulder, or if improperly held, to break your jaw. When firing, the gun needs to be held tightly to the shoulder and the shooter should lean a little forward.

What do I need to know about the high-powered rifle?

As Seymour continues concerning the rifle: "A rifle has a series of spiral grooves cut down inside the barrel, and a single bullet of soft metal, or coated with soft metal. When the bullet is propelled out of the chamber of the gun into the barrel, the metal around it conforms to the shape of the spirals and this gives the bullet a spin. Without this spin the bullet will not travel accurately but will invariably veer to one side or another. The 'twenty-two' (.22 inch bore) is common all over the world and is perfect for small game such as rabbits, hares, small deer, birds, or foxes crows and other marauders. Its ammunition is cheap, light and small, and the rifle is very effective up to several hundred yards.

"For larger game, however, larger rifles are really much better. Seven millimeter is a very common size (the 7 mm Mauser has always been, in my opinion, one of the best sporting rifles in the world; the 6.5 mm Manlicher is as good ballistically but has an inferior magazine). The 9 mm is fine for thick-skinned game." (The Guide to Self-Sufficiency, p. 198)

What about the handgun?

Handguns are inefficient for hunting. They are generally used for protection, or for law enforcement. In some states in the Lower 48, hunting with handguns is illegal, so check with authorities before hunting there. In Alaska, 5 AAC 92.075 states that "Big game may be taken (1) with a shotgun, muzzle-loading rifle, or rifle or pistol using center-firing cartridges, however in Unit 23, swimming caribou may be taken from a boat with a .22 caliber weapon using rimfire cartridges." As the National Rifle Association notes, "The person who masters the fundamentals of good rifle shooting (grip, position, sight alignment, trigger squeeze and breath control) will find them adaptable to handgun shooting." (Basic Hunter's Guide, p. 192)

How do I properly clean firearms?

First make sure they are unloaded. Too many people are maimed or killed attempting to clean a loaded weapon. Always treat the weapon as if it were loaded.

As the National Rifle Association notes, "regular cleaning will help keep your gun in good working order and will prevent it from rusting. Any firearm which has been stored uncovered for a long time or has been exposed to moisture or dirt, must be cleaned thoroughly before use.

"To clean a firearm you will need:

1. cleaning rod
2. patches
3. powder solvent
4. light gun oil

Before cleaning any firearm, check to be sure it is unloaded.

"After cleaning the gun with rod and patches, apply a light coat of oil to the metal parts of the gun. Make sure to use the oil sparingly. Too much oil can clog the gun and prevent the firearm action from working smoothly.

"When the firearm is clean, store the unloaded gun in a horizontal position, in a locked cabinet.

"After storage and before you use the gun again, run a clean patch through the bore before firing. Remove all excess grease and oil.

"Ammunition should also be kept clean. If sand or dirt collects in the bullet lubricant, it can damage the bore of the gun.

"Firearms owners should always assume that anyone untrained in the use of firearms will not know how to handle them properly. To prevent accidents, always store firearms and ammunition separately in locked storage units.

"Firearms are precision instruments. Guns which are not operating properly should be examined by a gunsmith or returned to the manufacturer. Even minor repairs should be made by an expert. Beginning and inexperienced shooters should never attempt to repair any firearm." (Basic Hunter's Guide, pp. 181-182)

Note:

Before using firearms it is advisable to take the "Hunter Education Course." It is not mandatory in Alaska at this time, but if you ever plan to hunt in another state that does require the course, you will have already completed it.

Safety Around Aircraft

Teacher Page

Competency: Work safely around aircraft

Tasks: Demonstrate safety around aircraft
Do not transport flammables in aircraft

Introduction

Alaska has one of the highest aircraft ownership per capita of any place on earth. Safety around aircraft is a factor in successful employment in many jobs in the area of renewable natural resources. You may be traveling on a variety of small aircraft in the course of your job.

Overview

A number of jobs in Alaska involve air travel. With thirteen international, twelve interstate, and more than twenty air carriers within the state, as well as many air taxi operators, Alaska offers one of the best opportunities anywhere for the aspiring aviator.

Suggested Learning Activities

1. Discuss reasons for storing fuel separately from passengers.
2. Brainstorm hazards of boarding, flying, and disembarking from aircraft.
3. Develop safety rules to follow around aircraft.
4. In the classroom, role play use of safety rules.
5. Invite a pilot to class to discuss safety around aircraft.
6. Take a field trip to practice safely boarding, flying in, and disembarking from a small plane or helicopter.

Resources

Alaska Airlines, 4750 International Road, Anchorage, AK 99502

Federal Aviation Administration, 701 C Street, P.O. Box 13, Anchorage, AK 99513

MarkAir, P.O. Box 6769, Anchorage, AK 99502

Reeve Aleutian Airways, 4700 West International Airport Road, Anchorage, AK 99502

U.S. Forest Service, Tongass National Forest, Ketchikan Area, Federal Building, Ketchikan, AK 99901, Stikine Area, P.O. Box 309, Petersburg, AK 99833, Chatham Area, 204 Siginaka Way, Sitka, AK 99835. *Ask for the "Aviation Go-No-Go Checklist."*

Safety Around Aircraft

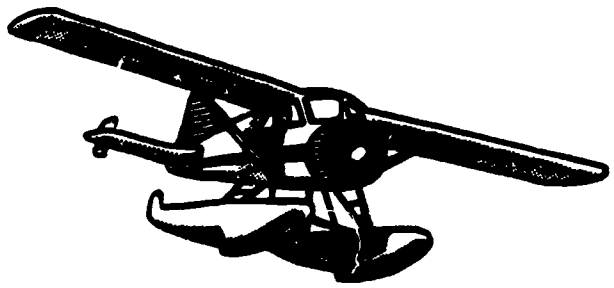
Why is aircraft safety so important?

A mass of metal and fabric, flying through the air three or four times highway speeds, can, upon impact with another object, cause some real damage. Aircraft can be dangerous.

No matter where you go in Alaska, if you are involved in the wildlife field, you will work, in some way, around aircraft. That aircraft might be owned by an air taxi operator or it might be privately owned. It might be a 9-passenger Islander or even a two-passenger Cub. Air carriers are insured and their aircraft are inspected. However, you have a certain responsibility to check the aircraft and the pilot out for yourself. On a day when the visibility is poor and you don't have to fly , it might be safer for you to put off your travel for another day. Follow the pilot's instructions about wearing your seat belt, and watch carefully when the location of the plane's safety equipment is shown. Pay special attention when the Emergency Locater Transmitter (ELT)) is pointed out.

Where do I put my camp fuel when I fly?

Don't put it up front where you're sitting. If a bottle of fuel happened to ignite while you're in the air, you wouldn't just hop out of the plane You'd be flying with burning fuel. Another fact is that a plane can crash. When the plane goes down, you don't want fuel spilling all over you. One of the biggest obstacles to surviving a plane crash is fire. You want to minimize that hazard. That's why carrying fuel on commercial airlines is prohibited. On private aircraft camp fuel is carried in the back of the aircraft, far from passengers. Fuel is only flown into remote areas when no other means of transportation are available.

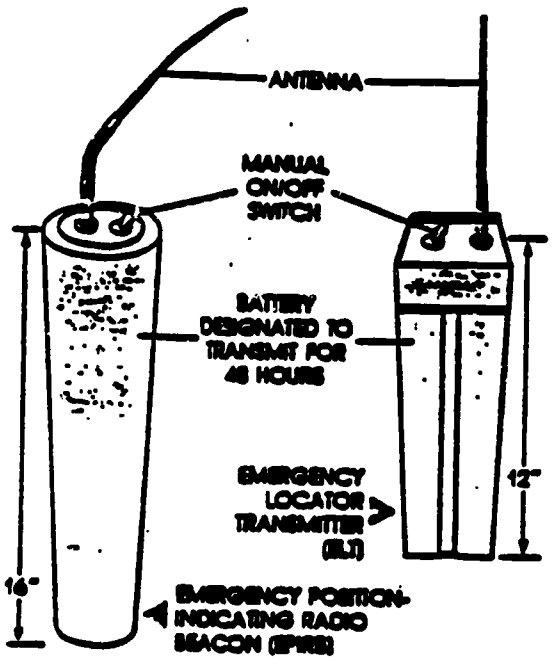


The U.S. Forest Service offers the following "Go-No-Go Checklist" for employees working around aircraft:

If any one of the following situations is present cancel the trip. If already in flight ask to land until conditions warrant continuing.

1. **Visibility and Ceiling Requirements.**
   AIRPLANE-Two miles visibility and five hundred foot ceiling.
   HELICOPER- One-half mile visibility and five hundred foot ceiling.
   You must always have these minimums.
2. **Foggy Weather-** Beware of fog, make certain ceiling and visibility minimums are present and you won't get caught in the fog.

3. **Snow Squalls**- Snow squalls develop very quickly in the spring and fall months. Maintain ceiling and visibility minimums and remember they can deteriorate extremely fast.
4. **Wind**-Thirty knots of wind speed are the maximum allowable because of emergency water landing conditions and turbulence.
5. **Mountain Passes**-If passes are partially obscured and appear marginal do not enter them for investigation. It may be too late to turn around.
6. **Pilots**-Watch for indications that the pilot's mental or physical condition are not conducive to safe flying, i.e., anger, tiredness, nervousness, or inattention.



7. **Aircraft**-Be concerned if you observe damage, dirt, fuel or oil leaks. Report it to the Aviation Officer.
8. **In Flight Communication**-Make sure radio communications are maintained with dispatcher or FAA.
9. **Loose Cargo and Overloading**-Never overload an aircraft. Make certain the pilot has all cargo secure.
10. **Passenger Briefing**-The pilot must give you a briefing before departure on where the emergency equipment is and how to use it.
11. **Personal Protective Equipment**-You must wear in an inflatable vest with a survival kit in a helicopter over water. Although you don't have to wear them in an airplane they must be made available to you. We strongly urge you to wear them. A flight helmet, fire resistant coveralls, and gloves will be furnished to you and must be worn on all helicopter flights.
12. **Helicopter Foreman**-A qualified helicopter foreman is required to supervise each helicopter and is responsible for your safety around helicopters. ("Aviation Go-No-Go Checklist, U.S. Forest Service Alaska Region)

Cross-Country Skiing and Snowshoeing

Teacher Page

Competency: Cross-country ski and snowshoe

Tasks:
Choose proper skis
Choose proper ski wax
Wear proper ski and snowshoe clothing
Select correct-sized skies and/or snowshoes
Carry first aid and survival equipment
Ski or snowshoe with proper technique

Introduction

Some jobs require the officer, ranger or technician to cross-country ski or snowshoe. Many in Alaska have done both for recreation; these healthful sports gain greater acceptance and popularity every day. Both sports (and modes of transportation) have been influenced by technology, with ever-stronger and lighter equipment coming into use. Telemark skiing has become a very popular pastime in many ski areas.

Overview

Alaska's ski areas employ teachers of cross-country skiing and snowshoeing. A number of lodges around the state have facilities for these two activities. The work of ranger, fish and wildlife technician (limited) or biologist may call for the employee to use cross-country skis or snow shoes in the course of their work. Fish and wildlife protection officers may use a 4x4 vehicle, aircraft and snow machine for the bulk of their work, but skill using skis may be needed for certain jobs, and use of snowshoes is definitely useful. Many of these skills may be learned as part of special assignments after being employed, but skills acquired beforehand may make certain applicants all the more attractive.

Suggested Learning Activities

1. Invite a ski and snowshoe dealer to class to demonstrate how to select appropriate skis and showshoes for one's height and weight, how to put them on, how to use. Discuss waxing techniques, if appropriate.
2. Discuss principles of layering clothing for insulation and for hypothermia prevention.
3. Design and perform an experiment to test and compare the drying capacities of cotton, wool, polypropylene, fleece, etc.
4. Assemble first aid kits in small groups.
5. Choose appropriate skis and snowshoes. Wax skis if appropriate.
6. Go for several ski or snowshoe outings, preferably including small-group instruction from qualified instructor on skills such as turning, stopping, climbing. Instructor coaching makes a difference.

Resources

Books:

The Complete Snow Camper's Guide, Raymond Bridge, Charles Scribner's Sons, New York, 1981.

Wilderness Survival, British Columbia Forest Service, Outdoor Recreation Branch, Victoria, British Columbia

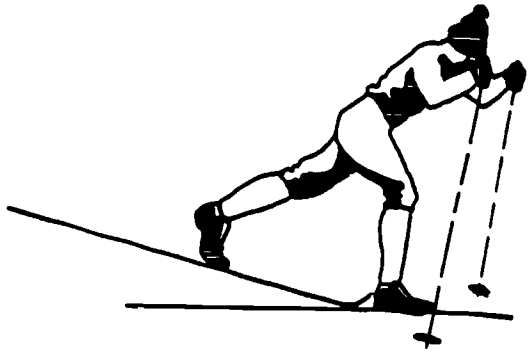
Wintering, Russ Mohney, Stackpole Books, P.O. Box 1831, Harrisburg, PA 17105

Cross-Country Skiing and Snowshoeing

How do I choose proper skis?

Your dealer can help you. They are specialists in making sure you have skis proper for your height and weight–and skiing ability. As Raymond Bridge notes, "for most wilderness skiing you should pick a ski in the range between what used to be called light touring and extra-light touring skis. Modern construction makes such skis strong enough for wilderness use, and their light weight is a delight on the trail. Such relatively narrow skis still give reasonable flotation in soft snow, but they are much better for breaking trail than wider models.

"...A reliable shop will both keep abreast of the latest constructions and advise you of the way particular skis have been holding up." (The New Complete Snow Camper's Guide, p. 135) A dealer can help you pick the correct-sized skis. The dealer uses charts that determine the size of ski or snowshoe according to your weight. If you regularly would wear a backpack that weighs 20 or 30 pounds, you generally would add that weight to your own in determining the size of ski or snowshoe. Adding the weights together is particularly important when selecting snowshoes. For skis, those working in the backcountry would probably choose three-pin bindings."



What is the purpose of ski wax?

Many cross-country skis are not meant to be waxed. For those skis, you need not concern yourself with ski wax. For waxable skis, Russ Mohney states, "the principle of cross-country ski wax is to give the surface of the ski enough traction to allow us to walk uphill against fairly moderate slopes, yet still allow the ski to slide freely when we want it to. This result is achieved by several special waxes that really do the job. The running wax–the kind in contact with the snow–has thousands of tiny snow crystals jammed into it when there is sufficient pressure on the ski, yet allows the crystals to melt during the friction of sliding. If the wax is soft enough to let the crystals penetrate at rest, yet hard enough to cause melting during movement, it is a good ski wax. The relative softness of the wax depends on the temperature of the snow, since some waxes get harder as they get colder. Obviously, there is a real art to properly waxing a pair of cross-country skis.

"A different kind of wax–base wax–is applied to the ski first to protect the surface. Sometimes a binder wax is applied to the base wax to, as the name implies, bind the running wax to the base wax. Most local outfitters have several grades of wax for varying snow temperatures; these local shops also dispense advice." (Wintering, pp. 190-191)

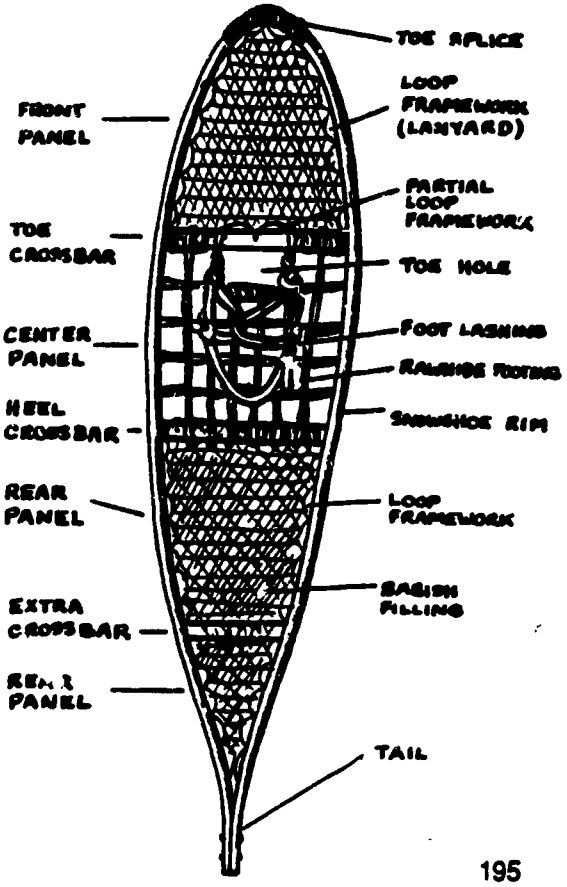
What clothing should I wear for skiing and snow shoeing?

When you're out in the cold, heat can be lost through convection, conduction, evaporation, and radiation. The goal of winter clothing is to keep your heat loss at a balance with your ability to generate heat. We can really work up a sweat when skiing or snow shoeing. Wearing several layers of medium-weight wool or polypropolene/fleece allows us to take off clothing (and keep it in our packs) when we are working hard, and to put it on when we aren't. Russ Mohney talks about four layers of clothing: the first lies close to the skin, which would include long-johns, T-shirts and other undergarments; the second includes comfortable wool or pile pants, wool shirt, and a hat or cap. He lists the third layer as "shells." These shells would be nylon windbreakers, and a second pair of light, tightly-woven trousers. The fourth layer is the heavy stuff, "reserved for those times when the temperatures drop to freezing and below." This layer may include heavily insulated coveralls ("refrigerator suits" or "Carharts"), and/or a down-filled parka or a heavy coat, insulated pants (preferably down-filled), a knit mask or balaclava. He also counts as an optional layer (certainly not optional in Southeast Alaska) rain gear–the first line of defense against hypothermia. Wool, pile and polypropelene fibers work best as they are light and are warm even when wet. (Wintering, pp. 53-54)

How do I choose the right size snowshoes?

Snowshoes today are generally made of aluminum frames with neoprene webbing. Some different bindings are available, for example, those with a "claw" that protrudes beneath the snowshoe for better grip on steep hard-pack snow. To find a proper boot fit, wear the socks at the dealer that you would wear when skiing or snowshoeing. (Or wear them when measuring your foot to order from a catalog.) Have the boots fit properly, with the same snug fit you would have with any other shoes or boots. Bunny boots or *Sorel*-type boots may be worn with skis (and are certainly commonly worn with snowshoes). Cross-country ski bindings for these larger boots are available, though somewhat expensive. In particularly cold weather many skiers choose to use their three-ring boots of leather or synthetic material with overboots of closed-cell foam or *thinsulite*.

PARTS OF A SNOWSHOE



What first aid and survival equipment do I need?

Experienced Alaskans prepare for the unexpected. The right clothing, high-energy foods, waterproof matches all might mean the difference between life and death in an emergency. The Government of British Columbia Forest Service lists the following items, in a waterproof container, as valuable in a survival kit:

- medium compress bandage
- small compress bandage
- large band aid (5)
- dental floss
- curved needle
- aluminum foil
- salt (2)
- coffee (2)
- dextrose–plain
- dextrose–chocolate
- knife (tape protecting edge)
- spoon
- halazone tablets
- soups–chicken and beef (23)
- tea (three varieties) (5)
- plastic bags (2)
- signalling mirror
- emergency saw
- wire for suspending cooling container
- 6 meters nylon shroud cord
- 15 meters fishing line
- small hooks (20)
- medium hooks (8)
- compass
- whistle and chain
- space blanket
- single edge razor blade
- snare wire–8 meters wrapped around knife, halazone tablets, flint and steel
- model cement (fire lighting)
- flint and steel
- magnifying glass
- waterproof matches [and disposable lighters!]
- waterproof container with cotton wool
- tin–package for kit and cooking container –sealed with vinyl tape
- soap
- ground to air signal card

The same publications lists the contents of a thorough first-aid kit as:

- Tape, not waterproof/5 cm roll for sprains, securing dressings, etc.
- Band aids (6) for small lacerations
- Butterfly for closing small lacerations
- Steri-pad gauze flats (4) 3 x 7 cm for larger wounds
- Razor blade, single-edge (1) For shaving hairy spots before taping
- Needle (1 medium-size) To remove splinters, etc.
- Moleskin (1/2 pkg. For blisters
- Elastic bandage (1) 7 cm For sprains, applying pressure, etc.
- Phisohex (28 ml) Mild antiseptic for abrasions, cuts.
- salt tablets (12) To prevent exhaustion and cramps due to heavy perspiring
- Aspirin (12) 5-grains 1 to 2 every 4 hours for pain
- Antacid *(Tums, Rolaids, etc.)* (6) for nausea, upset stomach
- Darvon compound (requires doctor's prescription) (6) 1 every 3 hours for more severe pain that cannot be controlled with aspirin
- Burn ointment (Nupercainal, etc.) (14 ml) To relieve minor burns. (Wilderness Survival, pp. 18-21)

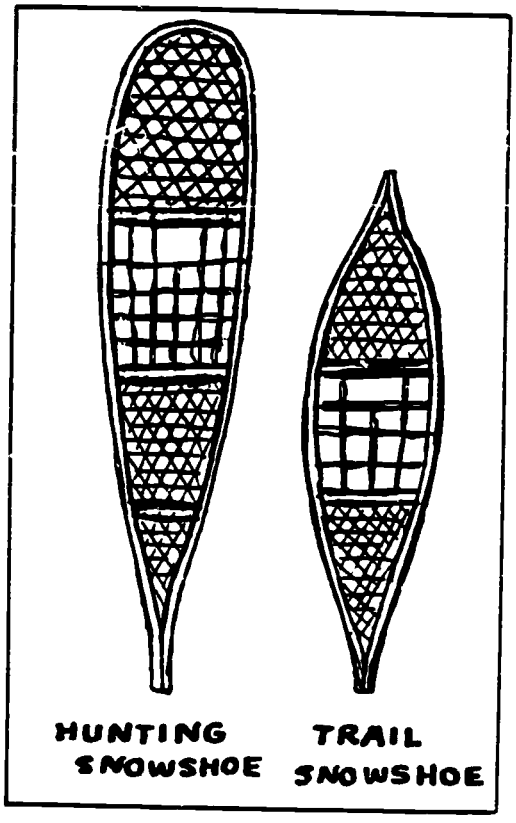
What techniques should I keep in mind while skiing?

If new to skiing, learn to ski in a supervised setting. Ski areas are ideal for learning. Don't expect your skills to fall in place on your first or second trips. Russ Mohney states: "after a fall, put the ski poles side by side on the snow and use them as a platform to push yourself back upright. *Don't* stick the pole down and use it like a crutch to get up; if the pole should break, you could fall on the upright portion, which is as deadly as any spear.

"When you've become confident enough to actually ski downhill, don't let the skis get the best of you. If you are going too fast or get out of control, sit down! Even if you have a full pack on, just sit backward and to one side to produce a more-or-less controlled fall. If the slope seems steeper than you'd care to descend, cross it with a series of diagonal runs similar to the downhill switchback you've hiked in summer.

"...If the downhill run is through timber or brush, remove the wrist-straps from the poles. If they remain secured to the wrist and a pole-basket gets tangled in a limb or root, a painful and serious dislocation could follow.

"In making turns, most beginners stop and make a step-turn rather than trying to maneuver on the fly. A step-turn is merely shifting the inside ski a little way toward the desired direction, following with the other ski, and repeating the process until you're headed the direction you want to go. A surprising number of skiers never bother to proceed to the more difficult turns; the step-turn does the job fine!" (Wintering, p. 192)



Guiding Hunters
Teacher Page

Competency: Guide hunters

Tasks:
Obtain all necessary permits for business
Attain guiding area
Advertise the operation
Plan outings well before beginning of season
Purchase food and equipment
Obtain first aid certification
Complete proper paperwork for insurance purposes
Check clients for proper equipment
Transport clients
Model hunting and wilderness ethics for clients
Assist client with cleaning of game, guns, and equipment
Cooperate with local law enforcement and conservation officials

Introduction

The business of commercial big-game hunting in Alaska is a $20 million business. The profession, however, is fraught with controversy, with political battles over who provides what exclusive service.

Overview

According to the Anchorage Daily News, "some of the hunting guides may gross as much as $500,000 annually." The newspaper says the average is more like $37,000 to $50,000 "not counting tips often left by rich clients." The "Alaska Career Guide" lists the guiding business under the heading "Recreation Guides." The booklet states that guides "organize and conduct hunting, fishing, hiking, float or similar trips for adventurers and tourists in scenic and wilderness areas. [They] demonstrate equipment and techniques. [They] explain rules and regulations. [They] observe clients to ensure their safety. ...The majority begin as helpers (packers, swampers, etc.) and advance with on-the-job experience. [They] need a general knowledge of the outdoors and specific skills relative to the type of outfitting or guiding service provided. Hunting and fishing guides must be licensed." The guide lists suggested courses as basic math, physical science, biology, oral communications, psychology, home economics, physical education, and general shop/mechanics.

Suggested Learning Activities

1. Invite registered guides to class to discuss their previous training, necessary skills, unique experiences in the field.
2. Invite Fish and Wildlife protection officers to discuss experiences with hunters and guides.
3. Cut out ads from old Alaska magazines advertising hunting and guiding services. Display on a poster. Analyze the wording used. What techniques of advertising are most effective?
4. Plan a mock hunting trip for a small group. List necessary equipment. Describe destination, accommodations, length of trip, related activities. Research the area and its potential for hunting, using Alaska magazine, Fish and Game magazine and reports.
5. Take a first aid course.
6. Apply for insurance coverage (practice) for a hunting expedition.
7. Ask the Department of Commerce and Economic Development for copies of hunting records. Examine in small groups and compare findings.
8. Role play an orientation meeting between a hunting guide and clients.

Resources

Alaskan Bowhunter's Association, Inc., P.O. Box 190629, Anchorage, AK 99519-0629

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802.

Alaska Professional Hunters Association, 301 E. 77th, P.O. Box 91932, Anchorage, AK 99509

Division of Occupational Licensing, Department of Commerce and Economic Development, Box D, Juneau, Alaska 99811 (907) 465-2538. *Ask for "Guide Board Statutes AS 8.54"*

References:

Alaska Game Trails With a Master Guide, Hal Waugh, Alaska Northwest Publishing Company, Box AA88, 130 Second Avenue South, Edmonds, WA 98020

"Game guides are under fire," Anchorage Daily News, , May 8, 1988, p. A-1, A-8 and A-9.

"When the kill counts more than the hunt, " Anchorage Daily News, , May 9, 1988, p. A-1, A-8 and A-9.

Guiding Hunters

What permits do I need to be a hunting guide?

You'll need to get a guiding area and a big game guide license. The work of big game guide in Alaska differs, however, from that of outfitter. Outfitters simply provide camping and transportation for hunters; they don't help hunters locate animals as a guide would do.

Alaska currently has 400 licensed, registered guides. Each guide would employ assistant guides and volunteer helpers.

How do I get a guiding area?

You need to realize that big-game guiding is an exclusive business in the state of Alaska. Not everyone who just decides to become a big-game guide can do so. The state has already been divided into guiding areas, and those areas have been assigned to licensed guides. Essentially the only entry-level positions open to someone in this field are those of *assistant guide*. An assistant guide can only work under licensed or master guides. But anyone can be an outfitter.

An **outfitter** is, according to the Anchorage Daily News, "someone hired by hunters to provide services that range from providing the gear to transporting hunters to the hunting area to taking care of pack horses or river rafts." No particular licenses or qualifications are required. "An outfitter cannot legally accompany or direct the hunter in the field while the hunter spots, stalks, pursues, tracks, kills or attempts to kill big game."

The Daily News notes that an **assistant guide** is "someone trying to break into the guiding business. They do most of the grunt work afield." Candidates "must be at least 19 years old, in sound physical condition, have served three years under a registered guide, and be favorably recommended to the board, in writing, by a registered guide." The candidate "cannot contract the hunts and can work only in the employment and under the supervision of a licensed guide."

As the Daily News notes, a licensed guide "accompanies hunters in the field, cares for them, and helps find, stalk and kill game." To be a licensed guide, the candidate must "serve a three-year apprenticeship in Alaska under a licensed, registered guide. Experience is documented by copies of at least three statements of financial remuneration for each year. Guides must be 21 or older, have first aid certification, and pass oral and written tests administered by the Guide Board. Guides can only hunt in their own restricted guide area or an open area. There are few open areas with enough animals for productive big game hunting. Guides cannot hunt in another guide's area without permission. Guides are required to accompany their clients in the field, or supervise an assistant guide accompanying clients in the field. The Guide Board has interpreted the supervisory requirement to mean that guides should be somewhere in the state when an assistant is with a

A **master guide** is "an honorary designation for accomplished veteran guides who have hunted in Alaska at least 10 years and have guided for five." Master guides "cannot have violated any hunting or fishing regulations within the previous five years. The guide board gives applicants an oral test."

As it stands now, to obtain a guide area, you would need to be a licensed or master guide, you would have to buy a guide area from another guide. The prices for such an area have reportedly ranged from $50,000 to $250,000.

Do I need to advertise?

Look in the back of magazines like *Alaska Magazine*. Many big-game guides and outfitters advertise. An area of caution is stating or implying that you can guarantee a kill. Direct promises of success are forbidden by law. Even though the client might rate the success of a trip on whether or not he or she killed the animal they set out to kill, you need to stress that success is not based on "bringing back your animal." Though competition with other guides may force advertisers to state "90% Success Rate!" or "Big Brown Bears Taken Nearly Every Trip!" the joy of the experience needs to be emphasized.

How much planning is involved in guiding hunters?

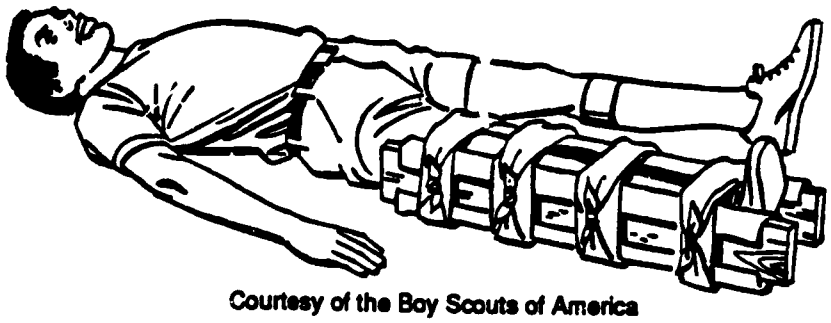
If you were working in a guiding area and were an assistant guide, class-A assistant guide, registered guide or master guide you would know all of the preparation involved in guiding hunters. You would know your guiding area, and would help plan a hunt which meets their time requirements and would assure success. You would make sure that your hunters are adequately outfitted with the proper clothing, food, camping gear, survival equipment, firearms and ammunition. Though outfitters may not guide hunters, the planning they pursue, depending on the nature of the trip (camping, rafting, photography, hunting), is similar to some of the planning that a hunting guide must pursue.

What food and equipment should I provide?

Clients' expectations vary. Probably the most comparable area in the world for big game hunting is Africa. In Africa hunters may stay in a luxury lodge, spend the day stalking game in a Land Rover, then have porters handle the kill while the hunter spends the evening dining in splendor. Though some places in Alaska may offer parallel experiences, regulation and terrain dictate and do not allow hunting from vehicles. Hunters may not fly and hunt on the same day. Many guides provide nearly everything needed for the hunt--everything but the personal clothing of the clients. If a client showed up without an important article of clothing, the guide would probably supply that. Most clients bring their own rifles and ammunition, but guides may supply that material as well. Many guiding services are "site to site," that is with everything supplied from the time the client is picked up to the time the client returns to the airport. That equipment would include some clothing, food, camping equipment, possibly guns, fuel, stove, transportation (bush plane and/or ATV), and shipping materials for meat and trophy.

Do I need first aid certification?

Licensed and master guides are required by law to have first aid certification. This first aid certification would include Red Cross Standard or Advanced First Aid, Emergency Trauma Training (ETT) or Emergency Medical Technician Training (EMT). Courses in all of these areas are readily available in Continuing Education Programs, colleges, and through Native organizations throughout the state. Additionally, the state is divided into emergency medical services regions. The addresses to the EMS councils can be found elsewhere in this publication.



Courtesy of the Boy Scouts of America

What records do I need to keep? Should I seek insurance coverage?

Those in the big game guiding business–and outfitters–need to be insured, largely because of the dangerous nature of the business. Guides must maintain records of hunts they guide. These records are, by law, collected and maintained by the Department of Commerce and Economic Development.

How should the clients be outfitted?

Different guides might have different styles of outfitting. While some clients might be used to ultra-deluxe accommodations in such exotic places as Kenya or Colorado, many of the on-the-ground accommodations in Alaska are basic. A guide with a guiding area may have a cabin in the area, and in fact many do. Typically, outfitted hunters in Alaska live a rustic existence. Since hunters may not fly and hunt on the same day, they must walk from the cabin, or more commonly, set up a tent someplace in the backcountry.

How do I move the clients around?

In most parts of the state, clients are transported by aircraft. However, as any big game guide can tell you, it is not lawful to hunt in the same day as airborne. The days that clients hunt, they must remain on the ground. As 5 AAC 92.085 (4) states, "a person who has been airborne may not take or assist in taking big game until after 3:00 a.m. following the day in which the flying occurred; however, this does not apply to taking deer."

How should I act around the clients?

A good Alaskan guide is ethical. This includes obeying the law. Obviously there is economic incentive to obtain a kill for the client. Such an incentive can be sporting. It must be emphasized to the clients that the purpose of trophy hunting is sport, not the attainment of the trophy. Clients are impressed by a conservation-minded guide. If you are aware of your impact on the environment, your actions will leave a lasting impression with your clients.

Should I help the client with their game, guns and equipment?

It is standard for a hunting guide to help the client with game, guns and equipment. Remember, it is unlawful for a visitor from outside Alaska to hunt, pursue or take a big game animal as defined by the Board of Game unless personally accompanied by a person who is licensed as a master guide, registered guide or Class-A assistant guide. Your client was required to employ you. You need to be the hospitable guide that the client expects. Most Alaskan guides do a good job of demonstrating this hospitality. Consult a practicing guide for pointers.

What role does the Alaska Department of Fish and Game play in big game hunting?

In Alaska, the Alaska Depa.tment of Fish and Game is in charge of creating regulations, as well as conducting research and other resource management duties. Fish and game biologists are deputized and are required to act on violations of fish and game regulations. The "game wardens" in Alaska belong to the "Fish and Wildlife Protection" division of the Alaska State Troopers. Each and every one of these "fish cops" is a full-fledged Alaska State Trooper.

Commercial big-game hunting in Alaska is big business—a $20 million annual business. According to the Anchorage Daily News, the Alaska Department of Commerce classifies Big Game Hunting as Alaska's seventh-largest business. ("When the kill counts more than the hunt, " p. A-1, A-8 and A-9.)

Manage and Protect the Resource

Construction and Maintenance

Teacher Page

Competency: **Perform general construction and maintenance duties**

Tasks:
Maintain and repair fences, gates and pens
Maintain paths, roads and grades
Maintain and repair waterways, ditches and culverts
Plan daily maintenance activities
Construct paths, walks and structures
Operate arc and oxy-acetylene welding equipment
Form and pour concrete
Maintain and repair facilities

Introduction

Jobs in facilities maintenance and upkeep are seen as having a number of openings in the near future. Wildlife areas require management and management requires support. A strong background in facilities support will prepare a student for a variety of positions.

Overview

Some of the work involved in working in wildlife involves construction and maintenance of facilities. Alaska has a number of national wildlife refuges, which all have facilities that require maintenance. Pay varies, depending on the work location and the job classification.

Suggested Learning Activities

1. Invite maintenance staff to class to discuss their responsibilities on the job and previous training.
2. Spend a week as maintenance "interns" with local Forest Service or Park Service employees. Keep journals of activities.
3. Discuss experiences and compare notes.
4. Write a group book about experiences, using journals.

Resources

Construction Trades Curriculum and Construction Trades Resources. Office of Adult and Vocational Education, Alaska Department of Education, Box F, Juneau, AK 99811

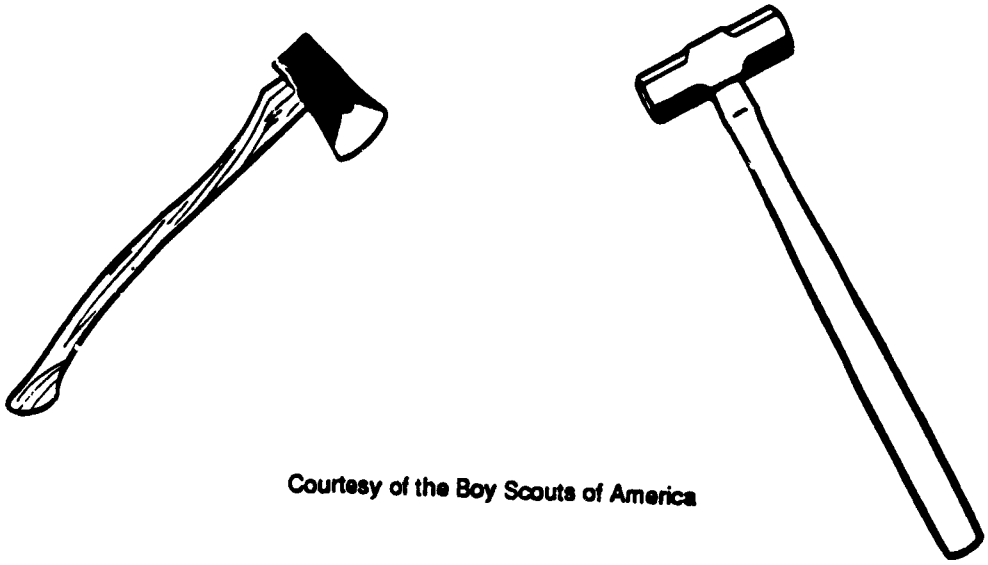
How to Work with Concrete and Masonry. Darrel Huff, Popular Science Skill Book, Harper & Roe, New York, 1976.

Construction and Maintenance

What maintenance-related work is available in state and federal wildlife areas?

Some of the best jobs in the area of wildlife are in maintaining the facilities of the wildlife area or refuge. Federal jobs are wage-grade, meaning the wage is based on local prevailing union scale. In certain jobs, maintenance workers make two to three times what a ranger or officer can make.

Alaska's wildlife preserves are large, though very few of them are developed. Several national parks and many state parks in the state have trails which need maintaining. For facilities and maintenance jobs related to national wildlife refuges and such, the jobs would be much like other maintenance jobs for facilities such as villages, cities, and state facilities.



Courtesy of the Boy Scouts of America

With Alaska's large open spaces, road construction is minimal. But each National Wildlife Refuge has a manager and some have staff. Each state park has a ranger. Each national park has someone responsible. A popular national park, like Denali National Park has a large maintenance staff. This staff would be involved in maintaining residences for the rangers and other staff, maintaining roads and trails, and maintaining equipment involved in all of this work.

What planning is involved in supervising the maintenance of wildlife areas?

Supervisory jobs in maintenance of wildlife areas parallel jobs with similar titles in private industry. Someone with strong skills in surveying, planning, construction, civil engineering, and electricity is an ideal candidate for supervisory jobs.

What kinds of instruction are involved?

Carpentry skills are integral to many of these jobs. Often wildlife areas lie far from cities and towns. A wildlife area maintenance worker might find him or herself building cabinets, fishwheels, erecting a building, or re-roofing a garage. A range of skills are needed.

Do I need to know how to weld?

Any skills involved in maintaining equipment will help your chances in this field. In many rural areas of Alaska facilities and specialists are not readily available. Costs for contracting out services may be prohibitive. Basic welding and cutting are useful skills.

Do I need to know how to work with concrete?

Experience with the basics of concrete work will help your chances for employment. Whether you have formal or informal experience forming and pouring concrete, it is useful to know the steps in completing a typical concrete job. How to Work with Concrete and Masonry lists those steps as:

- Excavate and prepare the base for the concrete.
- Build the forms and brace them solidly.
- Place reinforcing steel if you are using any–as you usually should do.
- Make arrangements for one or more helpers unless it's a [one-person] job.
- Order your concrete or ingredients. [Or m' . 't yourself.]
- Assemble tools–usually rake, shovel, floats, trowel. But don't forget gloves and possibly boots.
- If necessary, wet down the area so concrete won't dry too fast. Or place waterproofing membrane if needed.
- Mix the concrete or dump it from the transit-mix truck. Move it to the site and spread it with rake and shovel, spading and compacting.
- Strike off level, usually with a 2x4.
- Smooth the surface with a wood float.
- Complete finishing with steel trowel or with a broom, depending on finish wanted.
- Keep concrete moist for at least three days for proper hardening. (How to Work With Concrete, p. 3)

What skills do I need for maintaining and repairing facilities?

Most of the facilities in Alaska are small and those who work in maintenance will have to know how to accomplish a variety of tasks. Welding, carpentry, operation of heavy equipment, using hand and power tools are all skills that contribute to employability.

Natural History Library
Teacher Page

Competency: Use a natural history library

Tasks: Use bird and fish identification books
Use plant identification keys
Look up state and federal regulations in library

Introduction

Many of the jobs dealing with wildlife may involve at least a some familiarization with wildlife. A good place to become at least somewhat familiar with wildlife is in the public library or a natural history library. Alaskan natural history receives a lot of attention and a number of keys and other books are available. Additionally, bookstores in urban areas in Alaska have wide selections of plant keys, natural history texts, and other books related to Alaskan wildlife.

Overview

Many jobs in wildlife involve some use of the library. Though public natural history libraries are not commonly found, virtually all major libraries in the state have sections or selections related to natural history. Also, government agencies related to wildlife have libraries related to this field as well as to land planning and other issues. Those in charge of those libraries often are required to have experience in library science. Additionally, many Native organizations, oil companies and other groups or companies have libraries which they use in management. The "Alaska Career Guide" discusses the job of library assistant: "[They] sort and catalog new materials, inspect and repair returned books, file, return books and periodicals to shelves, type, issue overdue notices, and answer inquiries on a wide variety of subjects. May operate computer terminals and audio-visual equipment. ...High school graduation is the minimum requirement for most jobs. People with typing and some library skills are preferred. Some positions require 2-year college degrees." Suggested courses include basic math, physical science, oral and written communications, history, psychology, typing, and computer applications. Besides employment as a librarian or librarian assistant, the use of the natural history library benefits interpreters, managers, guides, and others with employment related to wildlife in Alaska. Not only are library skills useful in attaining employment (i.e. finding out about jobs), but they are useful in finding information related to that employment once acquired.

Suggested Learning Activities

1. Invite a librarian to class who will discuss resources available in the library, including books, keys, texts, periodicals, reader's guide, reference materials.
2. Ask your librarian to demonstrate the use of card catalog, microfiche, computers to search for resources available on specific topics.
3. Select topics for individual or small group research: must be wildlife related, fairly broad topics.
   a. Conduct literature search
   b. Prepare bibliographies
   c. Prepare library research paper with proper instruction and guidance in research and writing techniques. (Review the skills of note taking and outlining;
   drafting, revising, and editing the paper for content, incorporating help from members of small group; editing for content; and proofreading and editing for syntax, grammar, punctuation.)
   d. Present findings orally with instruction & guidance on proper oral presentation techniques, speaking clearly and concisely, projecting voice, with body still
4. Project Wild, "Wildlife Bibliography" (Students research and construct annotated bibliographies related to wildlife and society), page 145

Resources

Alaska Natural Resource and Outdoor Education Association (ANROE), P.O. Box 110536, Anchorage, AK 99511-00536. *Association of educators interested in and promoting natural history and wildlife education.*

Alaska Natural History Association (ANHA), c/o National Park Service, 2525 Gambell St., Anchorage, AK 99503. *Publishes books and distributes information on a variety of natural history, parks and recreation topics. Write for information. Their publications are available at Alaska Public Lands Information Centers in Anchorage, Fairbanks, Tok, and (soon to be) Ketchikan.*

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books:

Alaska Department of Fish and Game Wildlife Notebook Series, Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802

Checklist of Alaska Birds, University of Alaska Museum, Fairbanks, Alaska 99701

A Field Guide to the Birds of Alaska, R.H. Armstrong, Alaska Northwest Publishing Company, 137 East Seventh Avenue, Anchorage, AK 99501, 1980.

A Field Guide to Animal Tracks, Olaus Murie, Houghton-Mifflin Co., Boston, 1954

Golden Guide to Field Identification. BIRDS of North America, Golden Press, New York, 1966. *Perhaps the authoritative guide to bird watching. Watercolors of all species. A must for the bird watcher.*

Flora of Alaska and Neighboring Territories, Hulten, Eric, Stanford University, 1974. *The authoritative guide to the plants of Alaska.*

An Illustrated Key to the Freshwater Fishes of Alaska, Alaska Northwest Publishing Company, 137 East Seventh Avenue, Anchorage, AK 99501

Mammals of Alaska, Alaska Northwest Publishing Company, 137 East Seventh Avenue, Anchorage, AK 99501, 1981.

Reptiles and Amphibians in Alaska, the Yukon, and Northwest Territories, Alaska Northwest Publishing Company, 137 East Seventh Avenue, Anchorage, AK 99501, 1976.

Natural History Library

What kinds of books and periodicals do I need to use?

Before you visit the library think about what kind of information you need to find. It helps if you then make a survey of the literature to see what others have said about the population of wildlife or whatever area you are investigating. Field guides, periodicals such as *Alaska Fish and Game* and the *Alaska Department of Fish and Game Wildlife Notebook Series* are helpful.

How do I identify plants?

Many plant identification keys are available, but they use sophisticated and specialized vocabulary and require training to use accurately. Field notes are very important to wildlife investigation. If collecting plants, Riney states that the notes for each specimen will include the collector's name, date, specimen number, local name if known, correct scientific name if known, locality, altitude, a description of the plant and notes on the plant habitat. The keys help you to identify plants after collection.

Some plants are pressed in the field by placing them between sheets of absorbent paper, held between two wooden lattice frames by webbing straps. Such presses help dry and preserve the plants for later identification and study.

What kinds of state and federal regulations do I need to know?

Copies of state and federal regulations are available from the U.S. Fish and Wildlife Service, U.S. Forest Service, Alaska Department of Fish and Game, National Park Service and Alaska Fish and Wildlife Protection. Natural history libraries typically contain copies of such state and federal regulations.

NORTHERN PIKE

Courtesy of the Alaska Department of Fish and Game,
Wildlife Notebook Series

Scientific Method and Research Techniques

Teacher Page

Competency: **Apply research techniques**

Tasks:
Explain the scientific method
Apply research techniques to wildlife, plant and other land resources
Maintain a collection plot
Use several different types of microscopes
Prepare microscope slides
Use a hand lens
Record scientific data
Compile plant, soil, wildlife data
Record plant, soil, wildlife data
Make wildlife observations and keep records
Interpret scientific reports
Write scientific reports

Introduction

Competition for wildlife research positions is competitive because many people are interested in working with animals in the outdoors. However, with Alaska's enormous natural resources, employment in this area will remain steady.

Overview

The Alaska Department of Fish and Game employs a number of fish and game technicians in the summer and a lesser, but significant number throughout the year. Additionally, the U.S. Fish and Wildlife Service, National Park Service, U.S. Forest Service and other agencies employ a number of summer employees. Many of these employees collect scientific data. Additionally, many private firms are contracted to complete environmental impact statements and other baseline research, usually under contract with the government. These private research agencies sometimes offer entry-level field positions. The "Alaska Career Guide" states that fish and wildlife technicians "perform technical tasks in the study and protection of fish and wildlife. [They] collect and record data on the distribution and number of fish and wildlife including egg counts, weight-length measurements, tagging, and aerial surveys. [They] may work in a laboratory or at a remote field site. ...The intense competition for most openings results in most successful applicants having at least a 2-year degree in fisheries or wildlife technology or comparable experience." Many technicians hired by ADF & G in recent years have even held B.S. and M.S. degrees in wildlife conservation.

Suggested Learning Activities

1. "Project Wild", "Wildlife Research" (Students design wildlife research proposals), page 69; "Bird Song Survey"(Students inventory bird populations), page 231; "Can Do!" (Students conduct research and solve or improve a wildlife -related problem), page 201; "Improving Wildlife in the Community" (Students design and carry out a habitat improvement project) page 131.
2. Invite fish & wildlife biologists, foresters, and other researchers to class to present slides and to discuss the entire process of research in specific research projects.
3. Show videos and films about step-by-step research related to wildlife.
4. Students accompany researchers one-on-one into the field to "shadow" their activities and to take notes. After reporting back to class, students write up observations into "articles" to include in a whole class report describing the work and procedures involved in a research project.

5. Conduct an in-depth wildlife research project as a class, in small groups or individually. See activities listed under "Library research", refer to research techniques section and Study and Management of Large Mammals by Thane Riney and other sources. (WARNING: this project is likely to be quite time-consuming. It requires considerable planning & preparation.)
7. Students observe while teacher demonstrates proper use of microscope and dissecting scope.
8. Students examine, observe, draw, and label various prepared slides of onion skin, cheek cells, newspaper, etc.
9. Teacher demonstrates preparation of materials for examination, using slides, cover slips and stains.
10. Students prepare and stain slides of various materials for examination using cover slips.
11. Students draw objects observed under microscope.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Scientific Method and Research Techniques

What is the scientific method?

Science seeks to answer questions and to look for patterns in nature. The scientific method is a logical, orderly way to solve a problem or answer a question. There is no one scientific method. The steps of the scientific method might be thought of as:

Define the Problem:

Collect information on the Problem:

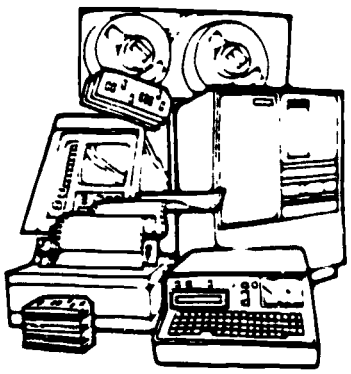
Form a hypothesis:

Experiment to test the hypothesis:

Observe and record data from the experiment:

Draw conclusions:

Accurately report research methods, results, and conclusions.



What are some research techniques I can use on the job?

Most field research projects use the scientific method by employing the following procedures:

1. Conduct library research–collect information before going into the field.
2. Develop a research question, based on research:
   a. Choose field study site. [Biologist level only]
3. Conduct field investigations, including:
   a. measuring environmental conditions
   b. observe/identify wildlife and vegetation
   c. collect wildlife and/or wildlife evidence.
4. Record field data
5. Analyzing data–recognize patterns [Biologist level only]
6. Interpreting data–draw conclusions [Biologist level only]
7. Presenting data
8. Improving wildlife habitat
9. Improving bird habitat

Steps 1-4 of the above sequence involve the measurement of environmental parameters (chemical/physical properties of water, soil, landforms): temperature, stream flow, gradient, length, depth, height, weight, humidity, barometric pressure, wind and water current, sediment grain size, rock formation type, salinity, acidity, etc. You might be involved in descriptions of major vegetative types, and characteristic species of vertebrate and invertebrate animals determined by various sampling procedures. You might be making behavioral observations of animals. You might be involved in projects which use various collecting and tagging apparatus including nets, screens or anesthetizers.

How do I maintain a collection plot?

It is important to keep a study site free of intrusive elements that might alter the conditions of the study. For example, in an area where other species, including humans, might interfere with the observation of the study species, a fence might prevent their intrusion. It helps, too, to obtain permission from landowners or regulating agencies who could shut down a study before its natural end.

You might need to use markers such as flagging, stakes, string, or chalk lines to remind you where to sample, and it helps to leave some measuring devices in place, with adequate shelter from the elements.

Do I need to know how to use the microscope?

It sure helps. You need to use one for the identification of invertebrates, some plants and one-celled organisms. Many of the classes you would need for an associate, bachelor's, masters, or doctorate degrees in wildlife or fields related to wildlife will involve use of a microscope. The microscope may be used for a wide range of tasks from analyzing animal stomach contents to analyzing stream water sampled from habitat.

Microscopes are tools of the biologist. Microscopes are instruments which use a combination of lenses to produce magnification of small objects. They are used to observe objects too small to be seen with the naked eye. Today's microscopes include light microscopes which uses light with glass lenses to magnify and electron microscopes which magnify by focusing a beam of electrons. Electron microscopes use magnets instead of glass lenses.

As Otto and Towle note in **Modern Biology**, "Since modern microscopes use ordinary light, such instruments are called light microscopes. A light microscope may have its own light source, or it may simply have a mirror that reflects available room light through the lenses.

"A light microscope contains several lenses. The lens at the top of the microscope is called the eyepiece. The sets of lenses at the bottom of the tube are called objectives. microscopes may have from one to four objectives. Different objective lenses give different magnifying powers. Microscopes commonly found in a school magnify about 100 times (100X) at low power. At high power their magnification is about 430X. At these magnifications cells and many microscopic plants and animals may be seen clearly. More magnification is needed to see smaller cell structures and very small living things, such as bacteria. Special objectives can give a magnification of 12,000 to nearly 2,000 times.

"The unit of measurement commonly used in microscopic study is the micron (μ). It is equal to 0.000001 meter or about 1/25,000 inch. Cells differ greatly in size. Bacteria range from 0.5 to 2 μ. Some single nerve cells may be as long as one meter.

"Lenses could be made that would give enlargements greater than 2000X. Yet no light microscope magnifies more than this because of the **resolving power** or resolution of the microscope. This is the microscope's ability to show that objects that are very close together are really separate. Light travels in waves. When light passes through the lenses of a microscope, the waves are scattered. The resolving power of a microscope is limited by this scattering of light. Two objects closer together than 0.4 μ will be seen as one object. Therefore, increasing the magnification of the lenses would not be helpful. Details would still be unclear because of the lack of resolution." (Modern Biology pp. 11-12)

How about making microscope slides?

Specimens are placed on glass slides for microscopic observation. The slides need to be cleaned before placing specimens on them. Some specimens are kept in place with smaller cover slides. These smaller cover slides are very thin squares of glass. Permanent slides are used for study and comparison. Some slides are *smears*, that is a small amount of a solution or other substance is smeared across the slide with another slide or a *cover slide*. In this manner, cells may be spread more thinly for easier observation.

How do I use a hand lens and other field and lab equipment?

Hold the lens up to the object, at about eighteen inches from your eyes. Slowly move the lends away from the object and toward you until you get the clearest image possible of the object. Microscopes and hand lenses are not the only tools you will use to observe plants and wildlife. Others include binoculars, spotting scopes and remote sensing devices used in radio telemetry.

Other field and lab equipment involved in wildlife jobs include scales, thermometers, meter sticks, water current meters, core samplers, and other specialized equipment. Fish and Game employees and others working in the field will be glad to show you the equipment they use.

How do I record scientific data?

Neatness and accuracy are very important when you record data. Most wildlife-related field notes include the date, time, relevant environmental conditions such as weather and temperature, and exact location of field studies. Wildlife observations made in the field are strictly descriptive of the animal's activities or of the human activities related to the wildlife under study, rather than interpretive or analytical. Data may be recorded on a graph, chart, or map, or they may consist of anecdotal behavioral notes. Drawings are most useful when they are as precise as possible, labeled as to location, date, any relevant environmental conditions, and the subject of the visual data. Good scientists also keep exact records of these parameters for all photographs used in field studies.

How do I compile plant, soil and wildlife data?

To compile data is to place data in one place or book.

Investigations involve basic questions and are usually based on the scientific method. According to Thane Riney, they involve project working plans which have a title, objectives, the value of the research, the scope of the project, background information related to the project, relation to other projects, methods for accomplishing the objectives, personnel involved, equipment or services needed, schedule, and projected reports. (Study and Management of Large Mammals, pp. 3-12) Compiling data is one part of this plan–the method part.

How do I record plant, soil, wildlife data?

Much of the work of the wildlife technician, and the wildlife biologist is collecting data. Data is used to devise, support, and refute theories. Theories are used to derive conclusions and conclusions are used to make human *decisions*.

Recording data involves notebooks (loose leaf or bound), forms, checklists and/or photography. Data cards and punch cards are, according to Riney, considered modifications of the loose leaf notebook. He suggests sometimes drafting the report *before* recording data, to point out special areas of focus when recording data. Riney notes that loose leaf notebooks facilitate classifying information. "Separate series of pages may be devoted to each species," he states. It is important to keep up with notes, not to let them accumulate over time. A tape recorder can be a useful tool. You may make up forms to help with the uniformity of data.

Riney notes the following when designing forms:

- make the forms the same size as the notebook
- arrange headings left to right in the same order that observations are made
- don't use different symbols in the same column. Make more columns. For example, don't put "M" and "F" in the same column. Have one column for males and one for females so you can just put a check mark in each box
- include an 'unknown' or '?' column
- make the form easy to understand
- try to visualize the final use of the information

Checklists help remind you of information needed in a particular study.

Finally, photography is a very important data-gathering tool. It can stir your memory later and can show animal specimens, their tracks food, as well as clearly documenting environmental parameters, such as vegetation, substrate, gradient, etc. (Study and Management of Large Mammals, pp. 12-16)

How do I make wildlife observations and keep records?

Scientists and technicians often record wildlife observations. Such records are then analyzed. Once you observe a pattern in data from the study, you attempt to deduce an explanation of the cause of the pattern, synthesizing conclusions drawn from related studies and the results of your own unique investigations.

Data analysis is not the job of a technician; it is the job of a biometrician or statistician who uses sophisticated techniques to find patterns or a lack of patterns in the numbers generated by field data. As a supervisor for ADF & G notes, "technicians will not have responsibility for research or for drawing conclusions or for report writing. In general, they are 'field assistants'."

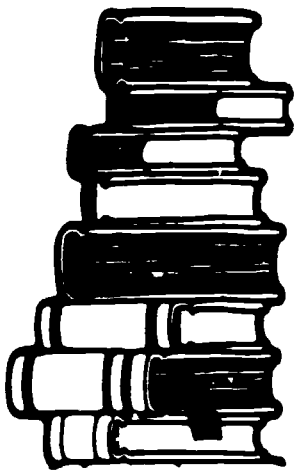
What special techniques are there in interpreting scientific reports?

Ask yourself questions while you read. For example: does this study really measure what it is supposed to measure? Are the conclusions of the study logical? Could other conclusions be possible? Was a large enough study used to validate conclusions, or were the conclusions based on insufficient data?

What are some tricks to writing scientific reports?

As in your field notes, you must be neat and precise in scientific writing. State your thesis (the conclusions you have reached based on your data) clearly and concisely. Present accurate, relevant details to substantiate your claims in as clear a manner as possible. Use relevant graphs, charts, photographs, and drawings to clarify your narrative explanations.

Scientists will closely scrutinize your data and your conclusions to determine the validity of your claims, so it helps to have objective assistance in editing your reports. Ask several scientists to read over your draft critically with an eye for inconsistent data or conclusions based on insufficient evidence.



Evaluating Habitat

Teacher Page

Competency: **Evaluate wildlife habitat**

Tasks:
Map habitat types using aerial photography
Field-check habitat typing
Assess relative values for various wildlife species
Identify man-made alterations that have changed habitat values and review potential impacts of proposed alterations

Introduction

Wildlife needs habitat. Decimations in wildlife populations around the world are generally considered to be more the result of a loss of habitat than overhunting or other pressures. Knowledge of wildlife involves knowledge of habitat. Decision-makers, technicians and managers typically concern themselves as much with habitat as they do with wildlife.

Overview

The job of evaluating habitat of course falls under the jurisdiction of the wildlife biologist. But land managers and planners also are involved in evaluating habitat, especially as it relates to management decisions. Those involved in such evaluation might include biologists, foresters, land planners, land managers, refuge managers, park rangers, and administrators. Additionally, Native corporations, oil companies, miners, and private individuals have a stake in evaluating habitat. Experience in this field is related to surveying, cartography, geography, and a host of other positions.

Suggested Learning Activities

1. Visit USFS foresters - ask them to demonstrate the use of stereoscopic viewers and aerial photography to evaluate and map vegetation types. Ask them to describe Land Use Designations (LUDs)) assigned to parts of forest.
2. Accompany foresters and other land use specialists into the field to observe the process of habitual evaluation. (ADF & G's Sport Fisheries and Commercial Fisheries Land Use staff might be helpful here. Commercial Fisheries staff prepare stream catalogs containing detailed maps that describe fisheries habitat).
3. Examine copies of stream catalogs and other habitat evaluation reports available through ADF&G, U.S. Park Service, U.S. Fish & Wildlife Service.
4. Ask representatives from ADF & G's habitat division, as well as staff from the Alaska Department of Environmental Conservation and the U.S. Environmental Protection Agency to participate in a panel discussion: have we impacted habitat for wildlife?

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books, Pamphlets, Videos:

"Alaska Fish and Game" Magazine and back issues. Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *Subscription one year, $9.00. Back issues: Pictorial, January–February 1987–Wildlife Week, May–June 1987–Big Game, September–October 1986. $2.00 each.*

Alaska Habitat Management Guide, Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

"Alaska Department of Fish and Game Wildlife Notebook Series," Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *A must for those who teach wildlife and related subjects. Collated sets, illustrated. 88 species of Alaskan wildlife. $5.00. Also "Activity Guide for Teachers" accompanies the Wildlife Notebook Series. $5.00.*

Evaluating Habitat

Do they use aerial photography to map habitat types?

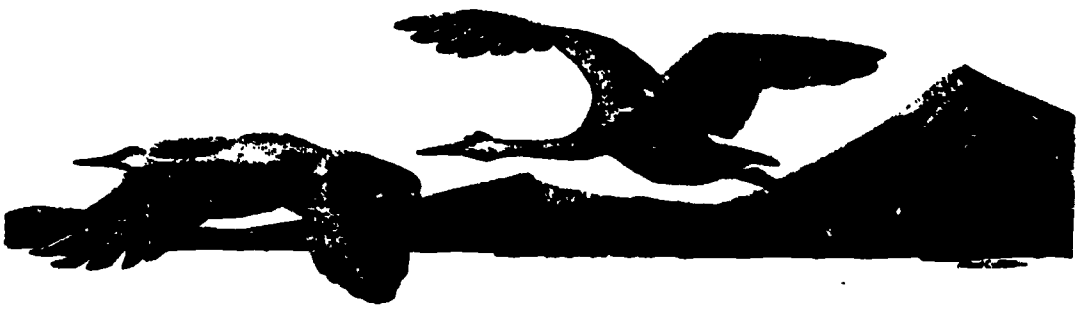
Aerial photography is a useful tool for mapping habitat types. Modern infrared cameras can map vegetation types, since different plant types show slightly different temperatures to these heat-sensitive camera. Matching such photos with ground verification can accurately assess varying habitat types over large areas.

How is habitat type checked?

"Ground-truthing" habitat involves actually going in the field and evaluating study plots, recording observations of certain plant types, and may involve some collection. Aerial photography and infrared photos have greatly improved capabilities in this area.

How do we assess relative values for various wildlife species?

It is hard to assess the relative values of different wildlife species. A value involves how someone, or groups of people *feel* about things. In a 1985 study of Alaskan visitors, wildlife watching was the activity with by far the highest level of participation in every region of the state. Historically (and emotionally) we feel differently about different animals. For example, look how favorably a deer is seen or a cuddly little bear and how detestable we consider a bat or rat. On the international scene, think of what sympathy a panda evokes, and what controversy–and mixed emotions–that wolves bring forth. All forms of life have value, and all have a place in the food chain. Human needs and desires bring other forces into play. Whatever the case, the wildlife manager has a need to remain objective about ecosystems, and sensitive to human considerations.

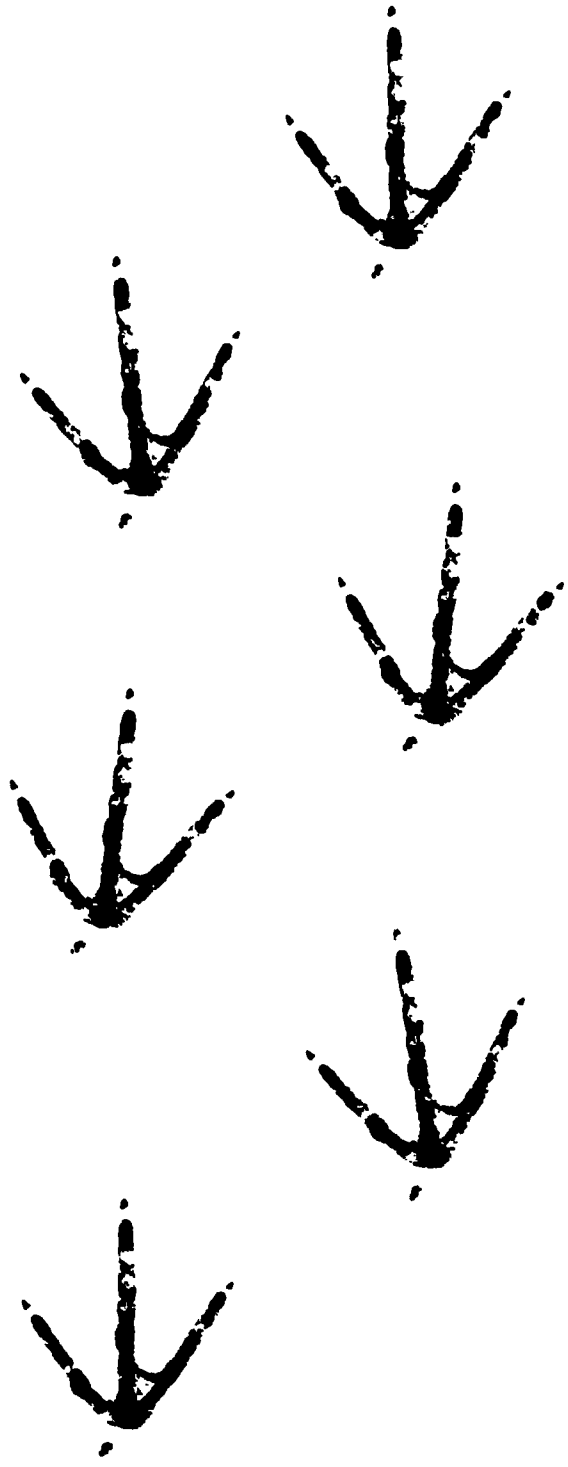


How have humans changed wildlife habitat?

The most powerful living force on the planet is human beings. Humans have altered the landscape, bridged rivers, and are able to clear the land and build cities. To date, Alaska has been spared some of the more destructive alterations of the Lower 48 and elsewhere, and Alaska is seen around the world as a place of pristine beauty. Some concerns regarding habitat include:

- dams and their impacts
- clearing of forests and underbrush
- use of agricultural or wildlands for urban expansion
- development on wetlands
- road construction and resulting impacts
- water pollution
- air pollution
- CO_2 in the atmosphere (greenhouse effect)
- erosion
- ocean pollution

Many or all of the above problems can affect wildlife. But all is not bleak. Proper management and planning can minimize damage and limit habitat destruction. Humans share the planet with wildlife. Their habitat is *our* habitat.



Working with Wildlife
Teacher Page

Competency: **Work with wildlife**

Tasks:
Explain ways to safely capture wildlife
Explain post-mortem procedures
Measure physiological indices
Analyze scientific data
Capture wildlife, including:
a. using invertebrate sampling devices
b. using live traps and nets
c. using anesthesizer

Introduction

Though some jobs directly involve capturing and handling wildlife, these jobs are few and far between. These jobs belong to the wildlife biologist, a job which takes a college degree and often a graduate degree. Also, wildlife biologist positions are quite competitive. These jobs do exist, and the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, National Park Service, and private scientific outfits hire them.

Overview

The "Alaska Career Guide" lists openings for 720 wildlife biologists statewide. Additionally, the same publication lists 200 openings for fish and wildlife technicians and 300 for park rangers. That gives over 1,220 jobs statewide directly related to wildlife, with others such as jobs at the Anchorage Zoo, jobs in interpretation, and jobs as photographic guide and other areas related to wildlife. Of the job "biologist" the "Alaska Career Guide" states: "a bachelor's degree is adequate preparation for some beginning jobs; however, those interested in a career in this field should plan to obtain an advanced degree due to intense competition for most biological jobs. A doctoral degree generally is required for college teaching and independent research." A supervisor for ADF & G notes that the PhD. will provide the applicant with a strong competitive edge for a career position in wildlife management.

Suggested Learning Activities

1. Invite personnel from the Anchorage Zoo, the Audubon Society, ADF&G, USFS Forestry Science Lab to discuss, describe , show slides regarding the direct handling and capture of wildlife for study or transport. For example, in Juneau, staff from ADF & G often deal with bear and deer. USFS Forestry Science Lab is conducting research on tame deer. All have experience handling game species. Steve Elliott, ADE & G Division of Sport Fish studies juvenile insects and salmon fry. Jim King, retired US F&WS biologist cares for injured raptors and waterfowl at his home. Call agencies for appropriate specialists.
2. Show films about the capture and study of wildlife.
3. Visit a facility such as the Anchorage Zoo, the Sitka Raptor Rehabilitation Project, the Juneau USFS Forestry Science Lab deer study to observe trained personnel handling these wild animals.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Working with Wildlife

How do I safely capture wildlife?

Some wildlife is captured with nets and live traps, others darted with anesthetizing darts. The work of capturing wildlife for scientific study would come under the direction of a biologist. The biological technician would follow the directions of the biologist so to safely capture the wildlife, to make sure that whatever data needed is collected, and that those capturing the wildlife do so safely.

What post-mortem procedures are used?

Sometimes wildlife is sacrificed for scientific study. Again, such post-mortem studies would not fall under the realm of the technician; they belong to the specialist. Technicians may assist with post-mortem procedures by, for instance, collecting specimens according to the requirements of the study.

What data do I need to collect from wildlife?

It depends on your study. If you want to know the range of a species, you mark animals or radio collar them to follow them or recapture them at a later date. If you want to know the population density of particular animals, there are various ways to determine that. If you want to know about the diet of a species, you watch it feeding and collect its scat (dung) for microscopic analysis.

Courtesy of the Alaska Department of Fish and Game, Wildlife Notebook Series

What data do I need to collect and analyze?

The data collected by a wildlife technician depends solely on the requirements of the study to be followed. Fish and game technicians work under the direction of wildlife biologists to complete scientific reports. The technician probably needs most to analyze whether or not he or she is meeting the requirements of the study, collecting the data required by the biologist. Some technicians become biologists (with four or more years of college), and many biologists (who have completed four or more years of college) work as technicians to gain experience in the field. Even so, the data to be collected is solely directed by the lead scientist(s) in a study.

What are some ways to capture wildlife?

For scientific purposes, one might also ask "what are some ways to *collect* wildlife? As stated before, wildlife is only sometimes collected, though much information can be obtained without collection. ADF & G captures and handles many hundreds of moose, caribou and bear annually. Depending on the species being collected, collectors might use an insect net, bird mist nets, live traps and benthic sampling devices and screens. The preferred option for large mammals is use a dart gun to inject them with anesthesizing drugs. Only someone fully trained in the use and safety of such a device uses darting equipment.

Wildlife Populations

Teacher Page

Competency: Know wildlife populations

Tasks: Distinguish sex of wildlife specimens
Keep track of wildlife populations
Sample wildlife populations
Explain how to take bird censuses
Assemble data in appropriate report

Introduction

Those working with wildlife populations typically work in the Alaska Department of Fish and Game, the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Native corporations, some private research and industry groups or for universities.

Overview

As with other jobs related to this field, competition is usually stiff. But one reason competition is stiff is that the jobs are attractive–one gets to perform field work in wilderness settings. Many in this field have strong personal feelings about wildlife. Low representation of Native and other minority groups in this field point to opportunities for those pursuing wildlife biology-related professions. Competition between forces in developing Alaska's resources provides some employment for private concerns completing Environmental Impact Statements or other studies related to wildlife.

Suggested Learning Activities

1. Accompany Audubon Society members on bird censuses.
2. Visit museums too view their collections of bird and mammal study skins.
3. Invite biologists to class to describe how census and sampling methods used to derive total population estimates of wildlife. Practice using their formulas using hypothetical data.
4. Conduct a study of small mammal populations using live traps. Record species, numbers, sex, and location. Compile and analyze data, check traps regularly and release animals daily when data is collected. They don't live long in traps.
5. Project Wild: "Birds of Prey" (Students graph animal populations from given data),p. 217; "I'm Thirsty!" (Students use given data in calculations related to wildlife adaptations), page 219; "Carrying Capacity"(Students simulate herds of animals to describe the significance of carrying capacity), page 221; "Turkey Trouble"(Students make computations related to wildlife populations using given data), page 227; "Deer Crossing"(Students evaluate alternatives to solve a problem involving wildlife), page 183; "How Many Bears Can Live in This Forest" (Students become "bears" to understand the importance of shelter and cover as a limiting factor and in habitat), page 101; "Bird Song Survey"(Students inventory bird populations), page 231.
6. Ask ADF & G, USFS, USFS Forestry Science Lab staff to give you a tour of fish weirs, vegetation plots, other study sites where you can observe the marking, tagging and censusing of animals.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

National Marine Fisheries Service, Box 1688, Juneau, AK 99802. (907) 586-7221. *Manages marine mammals and fisheries outside between two miles and two hundred miles offshore.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books, Pamphlets, Videos:

"Alaska Fish and Game" Magazine and back issues. Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *Subscription one year, $9.00. Back issues: Pictorial, January–February 1987–Wildlife Week, May–June 1987–Big Game, September–October 1986. $2.00 each.*

Alaska Habitat Management Guide. Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

"Alaska Department of Fish and Game Wildlife Notebook Series," Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *A must for those who teach wildlife and related subjects. Collated sets, illustrated. 88 species of Alaskan wildlife. $5.00. Also "Activity Guide for Teachers" accompanies the Wildlife Notebook Series. $5.00.*

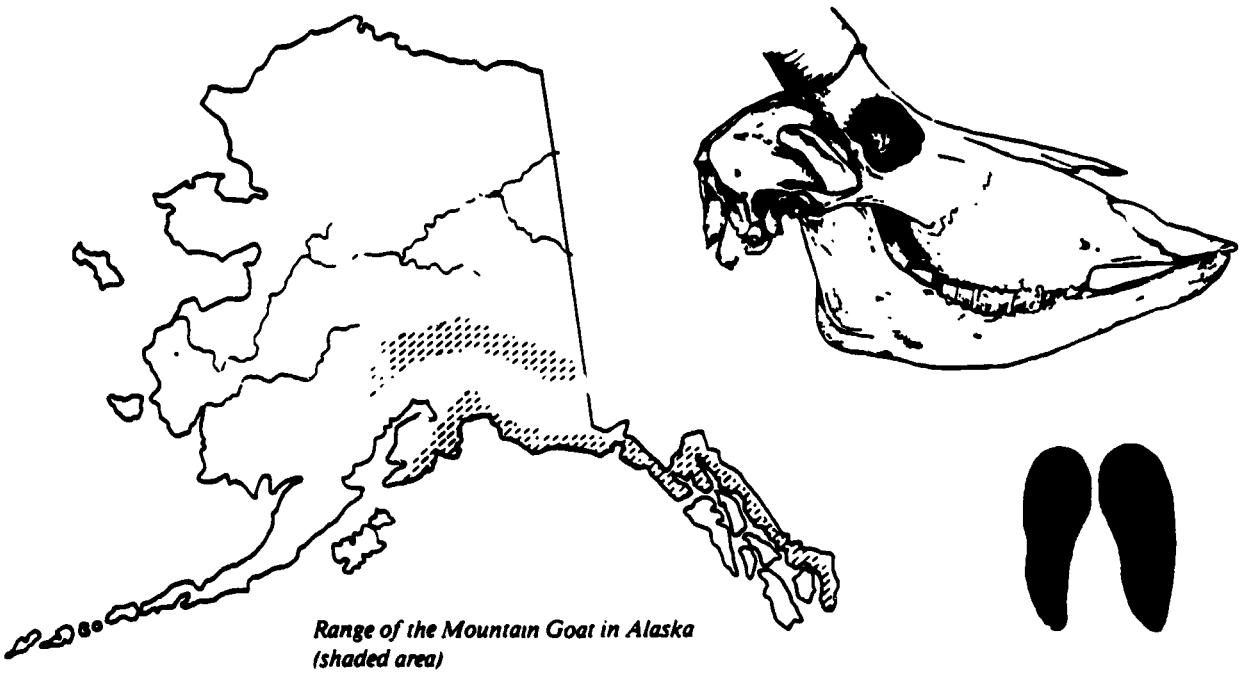
"Alaska's Special Areas." Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *A 28-minute VHS videotape featuring Alaska's game refuges, game sanctuaries and critical habitat areas. $14.95.*

A Guide to Wildlife Viewing in Alaska. Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *A 170-page full-color soft cover book providing information on all areas of the state. $12.95.*

Wildlife Populations

How do I know the difference between male and female animals?

The easy place to look is the genitals. But it's not always easy to get close enough to examine animals using this method. Other means are used for censusing, depending on the species. For example, with orca whales, the males lead pods of females. The males have prominent dorsal fins much taller than those of the female. Female moose are antlerless and smaller, though both have the prominent "bell" beneath their chin. Male waterfowl are often more colorful and larger, as is the case with many birds, though typically hunters do not need to differentiate among waterfowl. Those who census wildlife determine sex by color, size, sound, behavior, presence or absence or shape of antlers, or the presence or absence of horns.



Range of the Mountain Goat in Alaska (shaded area)

But hunters often have to pay special attention to the sex of their prey. Alaska hunting regulations allow the taking of game of certain sexes at certain times. For example, many units throughout the state only allow the taking of one bull. Special regulations as to the type of male taken are also sometimes in effect. For example, with moose, for certain game management units, the bull must have one antler that is a fork or a spike. These special regulations are listed in "Alaska Game Regulations." Other sex-specific regulations are in effect for dall sheep, musk oxen, deer, and caribou. The burden of determining the sex of the game harvested is on the hunter. Sheep hunters spend a good bit of time glassing sheep through binoculars before deciding to shoot. Penalties can be high.

How do we keep track of wildlife populations?

A wildlife population is a group of organisms of the same species inhabiting a certain geographic area at a particular time. A wildlife population is a unit by which managers consider particular animals. A population

changes over time and in reaction to environment. Populations interact: for example, wolf populations sometimes act on moose populations. Animal populations have structure, meaning so many of a population are a certain age and a certain sex. Populations change with seasons and other influences.

Wildlife managers use a number of ways to keep track of populations. First of all, they can look at what is known and published about the populations. The manager reviews previous studies, reports, government files, travelers' diaries and journals, and books on the animals. Previously-compiled checklists of animals are used. After this survey of literature, a species checklist can be constructed. Consistent observations can be recorded, including those known to occur from tracks or other signs located in the field. The checklists should include the observer, area, date, species, and notes. These checklists are a part of the everyday work of a wildlife technician in a park or preserve.

Some common survey methods for keeping track of wildlife populations include total counts, where all animals within a given area are actually counted, and sample counts, in which animals in a given area are counted to determine populations over a larger area. Other methods include counting tracks and scat and measuring forage consumed. A method which reduces the need for such involved field work is the the use of *indices*. Indices are indirect information which don't necessarily tell the exact population of the wildlife, but which indicate something about that population. For example, instead of estimating the deer population of a particular island, information about trends of scat counts in a particular area can be noted over time. Those trends would *indicate* something about the species. Sometimes trends are obtained by counting animals over specified routes at the same hours of day, same rate of travel and same time of year. Such information is often taken by fly-overs over particular routes. Other trends are taken by call and drumming counts, depending on the species. Wildlife managers and technicians must take great care to carefully record data and to maintain that data, obtaining samples under the same conditions at the same time of year over the same route over time. Only with such objective methods can objective information be attained. (Study and Management of Large Mammals, pp. 75-90)

How do I sample count wildlife populations?

Sample counts census wildlife populations without attempting to count every single animal. The results from counting randomly or systematically located strips or other type plots are then applied to the entire area. Some formulas are used to determine the approximate population for the entire area and the accuracy of the count. In some cases tagging large numbers of ducks and geese and then compiling data from hunters' returned tags offer information concerning populations. Sampling animals through capture and recapture is expensive, difficult and dangerous, not to mention not always useful.

What do I do with the data once I've sampled it?

Typically, data becomes a part of a wildlife plan or report that in itself becomes part of a plan. When specimens have been collected, having them carefully cataloged and cared for is of utmost importance. Samples can be invaluable at a later date, and their destruction may require expensive travel to replace them. One good specimen is better than a number of poor specimens, so handle them carefully. Hard wooden or metal cases are often used to protect specimens.

You may submit data to a wildlife biologist, university technician, or land manager. Typically the scientist analyzes data, looking for trends. From those trends the scientist formulates a theory. This theory, with the data supporting it, goes in reports, which are then presented as part of plans. Whatever part of that process you may have, the integrity of your data–how thorough, complete, neat and objective it is may prove to be of vital importance in determining the outcome.

Marking or Tagging Animals and Plants
Teacher Page

Competency: **Mark or tag animals and plants for identification**

Tasks:
Construct and erect signs
Capture and tag wildlife species
Observe areas for signs of wildlife and plant population shifts
Observe wildlife and plant life for diseases and pests

Introduction

The work of marking or tagging animals and plants is the work of the biologist, though under the direction of biologists fish and game technicians and forestry technicians sometimes complete some of these duties. Much of the work of the Alaska Department of Fish and Game, as well as the U.S. Forest Service involves collecting and processing information. That information is used to make management decisions. Much of the information they obtain comes from marked or tagged species that are then later recollected or followed, and thus information about origin, habits, life history, behavior and what finally happens to the animal or plant is obtained. Fish weirs, scat studies, vegetation plots, and census studies are all part of this information gathering procedure.

Overview

The job of marking or tagging animals and plants belongs to the wildlife biologist, the biology technician, the fish and wildlife technician, park technician or those with related jobs. There are many jobs in Alaska directly or indirectly related to obtaining this information. Some studies are conducted by private agencies under contract to local, state or federal governments. The requirement of Environmental Impact Statements before major environmental projects has provided employment for such technicians on projects in several areas of the state.

Suggested Learning Activities

See "Wildlife Populations."

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books:

Alaska Trees and Shrubs, Viereck and Little, U.S. Department of Agriculture, Handbook No. 410, Washington, DC, 1972. *For sale by the U.S. Government Printing Office, Washington, DC 20402. Listed price $3.25. An authoritative hardback guide.*

Study and Management of Large Mammals, Thane Riney, John Wiley & Sons, publishers, New York, 1982. *An involved but readable college text concerning wildlife management.*

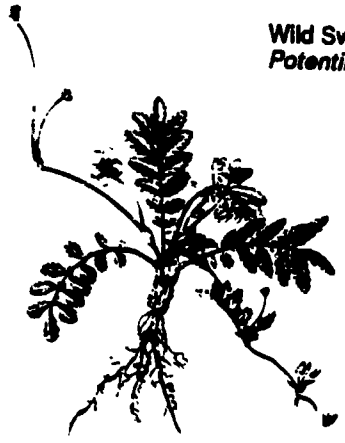
Marking or Tagging Animals and Plants

Do I need to construct and erect signs?

Some of the work involved in research projects or for research agencies involves basic tasks such as marking research plots, erecting information displays, or very simply tagging plants or plots under the direction of biologists. Those who don't see the work as part of the larger project–acquiring and analyzing data, may find it mundane. Some of the field work of the wildlife biologist or technician involves some pretty basic tasks. These tasks may be part of a very involved project, but that does not make them any less basic. As with any job, it's not all glory. In Alaska, in the bush, you can get dirty, wet, cold, and the possibility of getting hurt is always there.

Will I capture and tag wildlife?

Capturing wildlife or radio-tagging animals sometimes takes place, but is but a small part of the job of wildlife biologist. Typically the wildlife biologist (or technician) is collecting and analyzing information, making reports, defending reports, or compiling summaries of reports. Capturing and tagging wildlife is one method of obtaining information. The method can be very expensive, involving the use of live traps, aircraft, radio-collaring devices, monitoring equipment, and all the follow-up equipment, personnel, and data analysis such methods require. Additionally, such methods may be dangerous to the scientist or technician and may kill or injure the wildlife. Only after much thought and preparation would such drastic methods be employed, though the data collected may prove invaluable to the researcher.



Wild Sweetpotato
Potentilla pacifica

Courtesy of University of Alaska Cooperative Extension Service

Will I observe changes in wildlife and plants?

A method of gathering evidence of utilization of the environment by wildlife is to measure or estimate the percentage of annual growth removed by animals or the use of some index to the intensity of utilization. Measurements are taken of length of growth, or weight or number of grazing ratings or other assessments. Many techniques exist for extracting this evidence. The evidence can be used in a variety of ways.

For example, evidence of plants consumed by a species, combined with previously attained evidence of the occurrence of the same plant will give an index to the food preferences of the animal. Thus one can identify or more clearly define preferred foods and areas of use. (Study and Management of Large Mammals, pp. 141-142)

How would I study plant and animal diseases and pests?

Some of the work of the fish and wildlife technician, forestry technician, park technician, biologist, or biology assistant may involve investigation of plant and animal diseases and pests. Some may work directly on projects involving the investigation of disease or pests. For example, a technician may be collecting scat from a certain species for later examination in a laboratory. According to Thane Riney, one aid to diagnosis by wildlife disease specialists is the "on the spot" examination of a sick or dead animal. If a biologist or technician discovers a sick or dead animal in the field, notes taken would include:

- Activity. What was the animal doing before it died or was noted as sick?
- Posture. Was it moving about naturally, lying down, standing still or practically immobile?
- Feeding. Was the animal feeding prior to death?
- Drinking. Was it drinking normally, very much, or not at all?
- Respirations. Were they normal, slow, or fast? The technician should try to record the number of respirations per 60 seconds for the dying animal.
- Temperature. If the biologist or technician can take the rectal temperature of the dying animal, that information is useful.
- Urination. Note if a little or a lot of urine passed. Note the color of urine if possible.
- Defecation. Normal, hard, soft or liquid. Any signs of blood present? Smell normal, or unpleasant?
- Swellings on body. Size and location of any abnormal swellings on body, soft or hard; lymph glands or not.
- Mucous. Color, normal pink, very light pink or white, reddish, reddish blue or yellow, moist, dry or wet.
- Feces. Defecation normal, back legs soiled with liquid feces; color of feces or any abnormal contents, e.g. worms

Finally, labeled specimens, preserved and accompanied with a field report, should be taken to the supervisory facility as soon as possible. (Study and Management of Large Mammals, pp. 294-295)

As an ADF & G supervisor notes, "it is much more common to find a dead animal than a sick one what would allow things to be done to it. Field autopsy is quite common. This would include:

- Collecting blood sample.
- Collecting fecal and rumen samples.
- Examining all major organs for evidence of disease or parasites.
- Examining or collecting a long-bone for marrow analysis to determine state of nutrition.
- Skinning the animal to look for signs of bleeding prior to death–i.e. evidence of predation.
- Weighing and measuring.

Diseased plants are much easier to collect. The nature of the abnormality, the conditions under which it was observed, samples of abnormalities, and notes of the extent of the suspected plant disease would be useful to scientists. Pests noted on diseased twigs and limbs should be sampled along with the plant using standard sampling jars.

Maintaining and Improving Wildlife Habitat
Teacher Page

Competency: Maintain and improve wildlife habitat

Tasks:
Analyze habitat
Identify human activities that will pollute or alter wildlife habitat
Research laws to protect wildlife habitat
Enhance habitat if applicable
Work with controlled burns
Work with villages to improve habitat
Explain ethics and value of feeding animals
Identify human wildlife problems related to human garbage and ways to remedy them
Explain the issue of removing nuisance animals
Analyze ways to improve and protect moose, caribou, bear and deer habitat

Introduction

Alaska does not have many major habitat improvement projects. For those areas where habitat improvement projects may take place, they would fall under the direction of a biologist and would probably be performed by technicians. Some sports' groups also are involved in habitat improvement. Some groups, such as the Nature Conservancy, Ducks Unlimited and the Audubon Society in the Lower 48 buy and maintain important habitat such as wetlands.

Overview

Entry-level jobs related to habitat improvement would fall in the category of fish and wildlife technician, forestry technician, park technician or, in some cases, habitat specialist. The "Alaska Career Guide" describes the work of forestry technician: "Assist foresters in timber management by conducting resource surveys and timber sale layouts. Work on research projects in laboratories and in the field. Oversee road construction, logging operations, and reforestation. May work to improve fisheries habitat and prevent erosion. Develop and maintain trails and facilities. ...Work experience as a forestry technician or in a related area (planting trees, logging, fire fighting, etc.) or training in forest technology is very important. Some positions demand a valid driver's license. May work in temporary positions for several years before getting a permanent job."

Suggested Learning Activities

1. Introduce concept of habitat. Brainstorm habitats of various creatures.
2. Project Wild has too many activities relative to habitat to list them here. See the indexes in this exhaustive resource to locate appropriate activities.
3. Brainstorm human activities that pollute or alter wildlife or bird habitat.
4. Go for a walk . Notice and list as many examples of habitat destruction as you can (in teams - have a contest).
5. Ask resource agencies' public information officers to refer you to staff who could give "habitat tours" of wetlands, forest, meadows.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

Alaska Sportfishing Association, 3605 Arctic Blvd., #800, Anchorage, AK 99503 (907) 344-5235

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Alaska Waterfowl Association, 3105A Lakeshore Dr. #102, Anchorage, AK 99517 (907) 423-3235

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

The Student Conservation Association, P.O. Box 550, Charlestown, NH 03603 (603) 826-5206. *This agency manages volunteers in national parks, forests, refuges, on BLM lands, in state park and wildlife agencies, and private natural resource agencies.*

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, P.O. Box 21628, Juneau, AK 99802-1628

Territorial Sportsmen, P.O. Box 20761, Juneau, AK 99802

U.S. Army Corps of Engineers, P.O. Box 898, Anchorage, AK 99506-0898

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Maintaining and Improving Wildlife Habitat

What is habitat?

Habitat is an animal's surroundings–the living and non-living components of the environment where an animal lives: plants, other animal species, geological and hydrological features.

How do people affect wildlife habitat?

Probably the greatest affect that people have on wildlife is not so much in direct influences on the wildlife, but on wildlife habitat. Wildlife need a place to live, and as human populations expand into wild lands, and as resource extraction and development expand, wildlife habitat shrinks, displacing wild creatures.

Are there laws to protect wildlife habitat?

There are many laws protecting habitat. For example, there are laws protecting the land on either side of a salmon-spawning stream. The area around a bald eagle's nest is protected. Wetlands are protected, as is the coastline. For example, for permission to fill or construct on coastal wetlands, permission from the Army Corps of Engineers and various state agencies is required.

Should wildlife habitat be enhanced? If yes, in what ways?

In the lower '48 wildlife habitat is often enhanced. Brush piles, artificial wildflower planting, aerial hay drops, and, in the past, control of predators are ways that wildlife habitat has been enhanced. One problem with enhancing habitat for one species is that it can affect populations of other species, causing negative effects throughout the food chain.

What are controlled burns and how do they work?

Fires occur naturally in forests, a result of lightning. Alaska has many lightning-caused fires. In the past, land management agencies often put out, or suppressed, forest and brush fires. But in an area in which natural as well as human-caused fires are suppressed, underbrush or undesirable plants could flourish. Those areas could become poor wildlife habitat. Controlled burns are intentionally set forest fires which can allow such areas to become good wildlife habitat by removing undesirable plants. Additionally, the ash from the fire can make the soil richer. Federal and state agencies have agreed on specific areas in the state where fires will not be suppressed, but allowed to burn to naturally enhance wildlife habitat.

How can Alaskan communities improve habitat?

Citizens in Tok have improved habitat for moose. Volunteers cut down and crushed willows which had grown too tall for moose to reach for food. The villages of Togiak and Manokotak have assisted in the transplanting of caribou to the Nushagak Peninsula. Villagers can reduce their environmental damage, guarding the disposal of refuse, especially plastic. They can make sure not to dump oil or other hazardous wastes into streams or on the ground. (Oil waste bins are usually found at public docks. Recycling bins can also be found at service stations. Waste oil can also be used in certain burners for home or school heating.) They can guard against forest and brush fires. They can incinerate trash rather than put it in open dumps, keeping bears eating natural foods, rather than garbage.

Why don't we just feed wildlife?

Lots of people already do! When we leave our garbage outside our homes, when we leave sloppy camps when backpacking, when we leave cabin doors open in remote sites, we *are* feeding wildlife. We're making life easier for the animals; they don't have to fend for themselves. They become dependent on humans for their food; in fact, they begin to prefer human garbage to the natural diet.

How is human garbage a problem for wildlife?

The city of Juneau recently adopted the slogan "Garbage Kills Bears." Advertisements were placed all around town, telling people to not only secure their garbage cans with lids, but to keep the cans inside the house or garage. Garbage bears are dangerous. They become accustomed not only to human food, but to looking to humans *for* food. They start hanging around houses, villages and towns.

In some cases, wildlife can become sick or damaged by eating human food.

Should troublesome wildlife just be shot?

Some people think that's about like asking "shouldn't troublesome people just be eliminated?" Although much of the history of the settlement of the United States involved elimination of the native wildlife, hopefully, we've learned a lot in our time. Alaskan wildlife is valued for its beauty. Unfortunately, however, once a bear has grown accustomed to eating garbage, once a fox knows it can find a meal at someone's back door, that wild animal may end up being shot. The animal may begin hanging around where people live and making a dangerous nuisance of itself.

How can we can improve and protect moose, caribou, and deer habitat?

Entire agencies and organizations spend untold millions of dollars doing just that. They are paying for studies which direct where roads are built or where development takes place, preserving habitat as they can. In the Lower 48, sometimes habitat is enhanced by sowing fields with grain for wildlife, or in a famous case, limiting the use of certain chemicals such as DDT. Numerous environmental groups have formed for the sake of influencing government agencies so to protect habitat, or, in some cases, to purchase valuable habitat. The Nature Conservancy or Ducks Unlimited are examples of such agencies. The Alaska Department of Fish and Game employs scores of biologists studying moose, caribou and deer habitat that make recommendations. Some of these recommendations include where and how timber should be harvested. Other recommendations involve investigating possible impacts that mining, oil field development or wetland development have on fish and game resources. Identifying the interaction of these important game animals with their habitat helps our understanding of the animals themselves. Understanding the animals helps to assure their continued population.

Another important way to improve and protect moose, caribou and deer habitat is through effective zoning. Zoning directs where different kinds of development can happen: with careful study and planning, it can help reduce negative impacts to wildlife habitat.

Improving Bird Habitat
Teacher Page

Competency: **Maintain and improve bird habitat**

Tasks:
Identify physical and biological factors affecting bird habits
Describe artificial rearing and releasing of birds
Describe the purpose of bird banding
List ways of improving habitat for birds
Justify the importance of proper wetlands management

Introduction

The "hands-on" tasks related to improving bird habitat would undoubtedly fall to the fish and game technician. Alaska has enough wide open spaces that major wildlife habitat enhancement and reclamation projects are rare. [Exceptions include dusky Canada geese and four other species of geese in the Yukon-Kuskokwim Delta.] Habitat improvement and reclamation generally falls into the hands of the manager and planner, with information collected by the biologists and technicians and processed by biologists and other scientists. Improvement projects such as reseeding are often completed by private contractors.

Overview

Employment such as banding birds, examining habitat, and gathering information related to wildlife involves biologists, foresters, fish and wildlife technicians, park technicians, and plant scientists. Considerable work is done concerning birds, habitat, and fisheries through the U.S. Forest Service, National Park Service, Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and contract companies working with and for these agencies. Currently boroughs and Native organizations have begun independent wildlife data collection, providing some employment for rural people under the direction of a biologist. The North Slope Borough, for example, employs local people to collect whale data.

Suggested Learning Activities

See learning Activities for "Maintaining and Improving Wildlife Habitat."

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Alaska Waterfowl Association, 3105A Lakeshore Dr. #102, Anchorage, AK 99517 (907) 423-3235

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Marine Fisheries Service, Box 1688, Juneau, AK 99802. (907) 586-7221. *Manages marine mammals and fisheries outside between two miles and two hundred miles offshore.*
National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books

Alaska Habitat Management Guide, Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

Basic Hunter's Guide, National Rifle Association, Sales Department, P.O. box 96031, Washington, DC 20090-6031. *A basic guide to hunting and to issues related to wildlife. Quotations used by permission National Rifle Association.*

A Guide to Field Identification: Birds of North America, Golden Press, New York, 1966. *A very complete handbook using watercolors.*

Guide to the Birds of Alaska, Robert H. Armstrong, Alaska Northwest Publishing Company, Box AA88, 130 Second Avenue South, Edmonds, WA 98020, 1983. *Authoritative and complete photo identification handbook.*

The Life of Birds, Joel Carl Welty, W.B. Saunders Company, West Washington Square, Philadelphia, PA 19105, 1975. *A thorough college text.*

Improving Bird Habitat

What physical and biological factors affect bird habits?

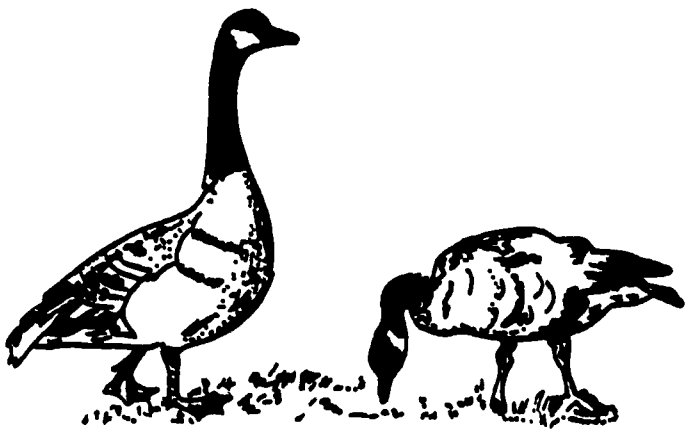
The availability of food and shelter, predator abundance and wetlands for waterfowl are the primary influences on bird habits. As Welty notes in Life of Birds, "behavior in birds, as in all animals, is largely directed towards self- and racial-survival. It is, in effect, an internally directed system of activities which strives to maintain the physiological stability of the body in the face of many environmental hazards, such as heat and cold, sun and rain, food lack, competition, predators and parasites." (Life of Birds, p. 163)

Why can't we just artificially rear and release birds?

In some places in the world they do. In fact some Alaskan bald eagles are being captured and released in places as far away as the Midwest and east coast. But artificially-reared birds miss out on what their parents can teach them. They do not benefit from the wilderness. Besides, such programs are costly.

Why are birds banded?

Birds are banded to give scientists information about bird migration patterns and timing. As Welty notes in The Life of Birds, even the most casual observer knows that vast numbers of birds depart from their northern homes at the end of the breeding season and fly to milder regions where they spend the winter. Great difficulties arise, however, when one seeks to learn more about migration. For example: Where does a specific, identified bird spend its winter? Does it migrate by day or night? At high altitudes or low? Does it travel in one uninterrupted flight or in several broken flights? In a relatively direct path or otherwise? Singly or in groups? In bad weather or in good? What keeps a bird on its normal path? To answer such questions, several different methods of observation have been developed recently. As a result, much more is known today about bird migration than was known in the past.



"One direct approach to the first question is to identify thousands of birds at their breeding (or wintering) grounds with individually numbered aluminum leg bands and then hope to recover some of these birds in their winter (or breeding) quarters). In North America about 600,000 birds are banded each year. While this method is commendable for its simplicity, it requires great effort and yields minimum results. ...Fortunately, recoveries are more numerous among game birds." (The Life of Birds, p. 464)

How can we improve habitat for birds?

Concerns in terms of habitat for birds include disturbances–by jets, hunters, ATVs, human bustle, logging, and loss of habitat due to recreational and industrial development. Other habitat concerns include populations of prey for the birds and effects of habitat disturbance on that prey, water quality, hunting and lead shot poisoning. Even though Alaska has large undisturbed areas, many Alaskan birds spend a good share of their lives further south. Though large-scale habitat improvement projects are not yet needed in Alaska, they are needed elsewhere. What happens to habitat for those birds in Canada, the Lower 48, Mexico and in other regions definitely affects birds in Alaska. In the Lower 48, and in certain parts of Alaska we have seen pollution of water and food. We have also seen a reduction in the food supply, alterations of freshwater habitat, dredging/filling/ draining of wetlands, disturbance of fall and spring staging areas, oiling of feathers, in-flight hazards such as transmission lines, and towers, alteration of nesting habitat, and even lead poisoning in heavily utilized hunting areas. Careful planning and resistance to some of the disturbances listed above can help improve bird habitat.

One way of improving habitat for birds is establishment of refuges or critical habitat areas. An example is the Dude Creek Critical Habitat Area in Gustavus. This area was established through the efforts of local people in order to protect one of very few resting areas for the Lesser Sandhill Crane as they migrate through Southeast Alaska each spring and fall.

Why is the need to manage wetlands so important?

Wetlands are nurseries–protected areas teeming with wildlife. They shelter tiny organisms which support much of the food chain, including birds, fish and mammals of land and sea. They also provide vegetation to feed and the wildlife species that live in them. Wetlands destruction results in a loss of habitat–and life–to birds and many other species within. Wetlands filter water, help restore underground fresh water reservoirs, control flooding, provide estuaries for fish fry, and act as barriers for wildfires. Wetlands are some of the richest habitats on earth.

Working with the Public
Teacher Page

Competency: Work with the public

Tasks:
Greet the visitor
Inform visitors of rules and regulations
Remind visitor of safety precautions
Assist visitor with visit to wildlife area
Know local language and customs
Answer informational requests

Introduction

Alaska is a popular destination. Currently worth over a billion dollars annually, Alaska's visitor industry is growing fast. Many of jobs are opening up in the visitor services area. Many visitors to Alaska are here to see wildlife. Those who work for national parks, wildlife refuges, on the state ferry, for the forest service, for state parks or for other agencies and who deal with the public are called *interpreters*. These interpreters interpret the natural environment and offer tidbits of other information to tourists.

Overview

The "Alaska Career Guide" states that tour guides "conduct visitors through museums, historic sites, parks and other places of interest while providing commentary. They give tours of glaciers, tundra, seafood canneries, pulp mills, and mines. They visit villages, towns, and cities. Most operate a car, van, or bus while describing points of interest. ...Employers prefer neat, polite, articulate and enthusiastic tour guides. May have to be 21 or 25 and have a good driving record for positions that require driving. Some employers require at least 2 years of college. Prior work experience meeting and assisting the public is useful." In 1987 130 were listed as employed with a salary of $1,200 to $2,000 per month. High school courses in basic math, physical science, oral communications, psychology, sociology, and auto mechanics were suggested.

Suggested Learning Activities

1. Invite someone from Toastmasters or a local visitor center to talk about tips for meeting the public.
2. Tour a local museum, park, or historic site where a commentary is provided. Students observe carefully the behavior of your guide, taking notes on how this person greets visitors, informs them of rules, regulations, and safety, answers questions, and shares information regarding the site and local features.
3. As a class brainstorm a checklist of "qualities of a good tour guide" for use in evaluating student practice tours.
4. Plan individual tours of building, neighborhood town, etc. for someone from outside Alaska.
5. Students evaluate partners' tours using skills checklists.

Resources

Alaska Natural Resource and Outdoor Education Association (ANROE), P.O. Box 110536, Anchorage, AK 99511-00536. *Association of educators interested in and promoting natural history and wildlife education.*

Alaska Natural History Association (ANHA), c/o National Park Service, 2525 Gambell St., Anchorage, AK 99503. *Publishes books and distributes information on a variety of natural history, parks and recreation topics. Write for information. Their publications are available at Alaska Public Lands Information Centers in Anchorage, Fairbanks, Tok, and (soon to be) Ketchikan.*

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Interpreters Association, c/o Paul Frandsen, 3801 W. Government Way, Seattle, WA 98199. *Association of those who make their living interpreting natural and human history to the public.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

Student Conservation Association, P.O. Box 550, Charlestown, NH 03603 (603) 826-5206. *This agency manages volunteers in national parks, forests, refuges, on BLM lands, in state park and wildlife agencies, and private natural resource agencies.*

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, P.O. Box 21628, Juneau, AK 99802-1628

Books and Magazines:

"Alaska Fish & Game," P.O. Box 3-2000, Juneau, AK 99802-2000. *Monthly magazine of the Alaska Department of Fish and Game.*

Working with the Public

Are there special ways to greet the visitor?

The visitor industry is the hospitality industry. When you greet visitors to a wildlife or recreation area, you may be the first Alaskan they come into contact with on the ground. They may be totally out of their element, in a strange place with unfamiliar ways, amongst strangers. Your friendly attitude, warm handshake, and genuine concern for their welfare will make a real difference in how they feel about their visit.

Should visitors be informed of rules and regulations?

Many of those visiting wildlife areas in the state are either on vacation or conducting research. The last thing some people want to concern themselves with is seeking out the rules and regulations to which they must adhere, even though it is their responsibility to know them. Many jobs involved in dealing with visitors deal with rules and regulations. The object of such rules and regulations is attain a certain behavior with a minimum of effort. Informing visitors up front of rules and regulations is not only an option, it's a necessity for their own health and safety. Not only will it bring things out in the open, but it will assure you that you have informed them of requirements. A good way many areas inform visitors of rules and regulations is by posting them in public places such as on public bulletin boards, at the post office, or by handing out a brochure or leaflet.

What do I need to tell the visitors about safety?

Give visitors the *basic* information they need to know. In Alaska, hypothermia, loss of body heat, is the killer. The visitor needs to be prepared for weather conditions. They need to know what to expect. They need information that you or another local may take for granted. Tell them of the need to carry warm clothing and rain gear in the Alaskan out-of-doors.

How can I help the visitor with the visit to the wildlife area?

Visitors will seek out information from officials and employees, from locals, and from other service providers related to their visit. You might want to keep a stock of brochures and supplies related to their visit to the wildlife setting. Such materials are available from the Alaska Department of Fish and Game and other sources.

Is there anything special I should know about the local language and customs?

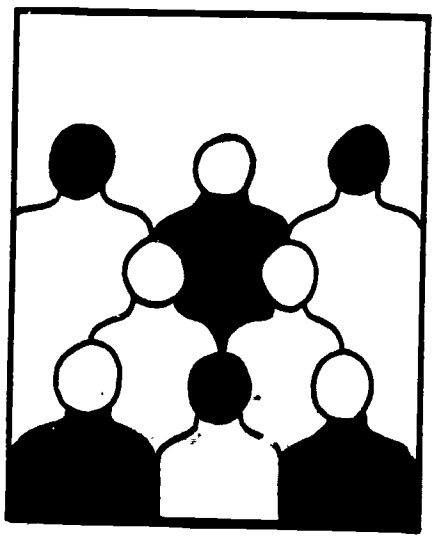
Visitors to wildlife settings are interested in more than just the wildlife. They might be interested in human interactions *with* wildlife and in the wildlife setting. You can enhance their visit with a knowledge not only of the local natural history, but with a knowledge of the human history as well. Additionally, relations with local people, especially the subsistence users, are greatly enhanced by your knowledge of the local language and customs. In many rural places in Alaska the Native language is only spoken by older people. That fact does not preclude your learning greetings and important phrases. If you are Alaska Native, you may already be knowledgeable in your Native tongue. Otherwise, expertise in the local language will contribute not only to those who visit the wildlife setting, but also to your own life and heritage as well.

What are some techniques for dealing with visitors on the phone?

Many visitors will call on the phone, and in the course of employment dealing with visitors, you will have many occasions to use the phone. In some areas only one person will handle the phones, in others it may be whoever answers it. When answering the phone, the employee should begin with a greeting such as "hello" or "good morning" and the name of the company, agency or department such as "Kanuti National Wildlife Refuge." If the caller asks to speak to a certain individual, the call should be transferred to the appropriate individual. For large operations, you would have a list of employees' extensions.

Concerning your voice on the phone, the publication Business Education Resources relates, "First, speak directly into the mouthpiece and use a normal voice. A loud voice sounds rude and may annoy the caller. A weak voice that can hardly be heard at the other end suggests inexperience and a lack of concern. Try to work toward that middle ground, a normal voice that's not too loud or too soft. A pleasant, normal voice tells the caller that you are confident and thoughtful.

"Second, a caller will more likely understand you if you speak at a normal rate of speed. Speaking too rapidly may confuse the caller, and you will probably have to repeat the information. Speaking too slowly makes you sound disinterested.



"Third, give meaning to your voice by emphasizing your words. Don't speak in a dull monotone. A caller wants to speak with an interested person, not a robot.

"And finally, speak clearly and pronounce every syllable carefully. Be careful not to run your words together, or the caller may not understand you. Also, make sure your mouth is empty during phone conversations–no food, gum, pencils, or cigarettes. Food or objects in your mouth can distort speech." (Business Education Resources, p 70)

Interpreting Natural Resources to the Public
Teacher Page

Competency: **Interpret natural resources to the public**

Tasks: Explain natural resources information to visitors
Conduct a slide show
Conduct a nature walk

Introduction

With over half the national wildlife refuge system in Alaska and Alaska's growing tourist economy, the potential for increasing interpretive services is growing. The private sector supplements budgets for state and federal agencies to supply interpretive services. The "Alaska Vacation Planner" lists numerous lodges, outfitters and other services where wildlife viewing is a primary activity. Students may use the booklet to contact lodges, guides and others. Federal and state agencies may be contacted at the addresses below.

Overview

Though the U.S. Fish and Wildlife Service does not specifically publicize positions in interpretation, that agency, the Alaska Department of Fish and Game, and several private companies (Gray Line of Alaska, etc.) offer positions in interpretation. The National Park Service and Alaska State Parks hires interpreters as do information centers throughout the state. Work for municipal, state and other museums is related to this employment. This employment is related to that of Tour Guide, listed in the "Alaska Career Guide."

Suggested Learning Activities

1. Invite a local interpretive guide from the USFS, USPS, museum, etc. to discuss what kinds of information interests visitors the most.
2. Attend slide shows, group interpretive presentations, and nature walks to observe and record guide behavior.
3. Brainstorm a list of "qualities of a good slide show/qualities of a good interpretive guide" that can be used as an evaluation tool.
4. In small groups, students choose a wildlife related topic and prepare a short slide show to address that topic, planning photographs to fit a given theme.
5. Present slide show
6. In small groups, plan and present a nature walk using notes to remember what to bring up at different points in the hike.
7. Evaluate fellow classmates presentations/nature walks using checklist.
8. Role play telephone conversations with visitors: one student acts as the interpreter, the other acts as the visitor. Trade places and evaluate one anothers' role plays.

Resources

Alaska Natural Resource and Outdoor Education Association (ANROE), P.O. Box 110536, Anchorage, AK 99511-00536. *Association of educators interested in and promoting natural history and wildlife education.*

Alaska Natural History Association (ANHA), c/o National Park Service, 2525 Gambell St., Anchorage, AK 99503. *Publishes books and distributes information on a variety of natural history, parks and recreation topics. Write for information. Their publications are available at Alaska Public Lands Information Centers in Anchorage, Fairbanks, Tok, and (soon to be) Ketchikan.*

American Cetacean Society, National Headquarters, P.O. Box 2639, San Pedro, CA 90731-0943
Teaching kits, whale charts, fact pact, cassettes, more.

National Interpreters Association, c/o Paul Frandsen, 3801 W. Government Way, Seattle, WA 98199. *Association of those who make their living interpreting natural and human resources to the public.*

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Alaska Waterfowl Association, 3105A Lakeshore Dr. #102, Anchorage, AK 99517 (907) 423-3235

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

Office of Adult and Vocational Education, Alaska Department of Education, P.O. Box F, Juneau, AK 99811. *The publication Business Education Resources is particularly useful for telephone techniques and other such interactions with the public.*

The Student Conservation Association, P.O. Box 550, Charlestown, NH 03603 (603) 826-5206. *This agency manages volunteers in national parks, forests, refuges, on BLM lands, in state park and wildlife agencies, and private natural resource agencies.*

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, P.O. Box 21628, Juneau, AK 99802-1628

Interpreting Natural Resources to the Public

What kinds of information do visitors want to know?

First of all, visitors like to see a friendly face. Alaska is famous for its hospitable population, and your cheerful attitude can add to that perception. Visitors often need quick, concise information such as the location of the rest room, restaurants, camping facilities etc. In a more formal moment or during a program you might offer visitors human and natural history of the area, unique information, and geographical facts and information. Visitors to wildlife areas are often interested in the wildlife, though there are those visiting solely for the recreational aspects of such areas. Alaska is so vast that even if you are a local and even if you have visited much of the area of interest, there will still be a good number of things you don't know. For example, a visitor may want to know certain conditions for completing a hike through a certain mountain pass. It will reflect positively on you to simply state that you have not visited that area, and you will ask somebody who has. There's nothing wrong with saying you don't know. Make sure to find out that information if you can, and to follow through by relaying it to the person who asked.

How do I give a slide show?

Giving a slide show involves a good deal of preparation. Many wildlife areas have an interpretive center where visitors receive an orientation to the area through slides. You may be asked to give such a program at a local school or to a civic group. Slides are attractive for the audience and they can help you with your talk by leading you through it. Some tips to giving a good slide show include:

- Pick a theme for your program, such as "wetlands", "human adventures" or "the little critters we often miss"
- Give your program some structure, with a beginning, middle and an end.
- Always prepare well beforehand.
- Have a good selection of pictures–quality shots.
- Practice the program. That way you can make sure your slides aren't upside down and that everything works.
- Don't keep any one slide on the screen very long. Ten seconds should be the most for the projection of any one image.
- Don't talk *to* your slides. Give a story that the slides will accompany.
- Make sure your program has a finite end. Let the audience out at the end by saying "If you have any questions, I'll be available afterwards."

How should I give a nature walk?

The standard fare of those involved with natural history interpretation is the slide show and the nature walk. As in much in the field of interpretation, there is an art and a skill to giving such presentations. First of all, be congenial. The skills of a public speaker include facing the person you are speaking with, showing a genuine interest in the visitor, and taking time for people. These skills will serve you well when dealing with visitors. Remember to take more time for those who need it, such as the elderly or the handicapped. A nature hike should be as hardy as the least capable member of the group can take. Some places, such as Denali National Park, advertise the strenuousness of the hike before setting out. Exhausting the visitor is certainly not the aim of such a nature hike.

Like the slide show, you need to be prepared before and during such a hike. Reading up on the natural and human history of the area will help. Additionally, you can take along plant keys and bird identification books. For those species you have some trouble with, you can read them with the visitor. Don't walk ahead of your group. You can lead, when you hike, but when you stop, plant someone at the front, and walk to the *middle* of the group to talk. That way those at the end of the line can hear. Make sure your facts are accurate and knowledgeable. But don't worry if you don't know everything–nobody does. No one likes a solid scientific dissertation on a simple nature hike. Those who want to explore in depth can do so on their own.

Like the slide show, the nature hike can benefit from a theme: having the visitors look for particular trends or occurrences during the hike. Additionally, visitor participation is useful, having those on the hike actually *doing* something. Assign some people on the hike to look for certain things. Have someone be in charge of the binoculars, another in charge of the flower book. Your walk should follow a planned route, and inform the visitors the exact time they will return. Rehearse the route before you take it. Lastly, enjoy yourself when giving the hike. Visitors are usually on vacation. Vacations are for enjoying. You're dealing with people who are presumably having the time of their lives. Do your best to help them do just that.

Law Enforcement
Teacher Page

Competency: Perform law enforcement

Tasks:
Interpret fish and game laws
Identify courses of study for basic law enforcement
Contact fish and wildlife area users
Record wildlife violation information
Observe laws and regulations relative to the operation
Interpret laws and regulations regarding land use
Interpret and apply wildlife and plant laws and regulations
Write a citation

Introduction

Possibly one of the most well-known and well-respected positions concerning wildlife in Alaska is that of Fish and Wildlife Protection Officer, Park Ranger, or U.S. Fish and Wildlife Service Officer. These jobs vary, and all of them have a technician-class level that leads to the position of greater responsibility. Though the "Alaska Career Guide" lists these positions as "limited," with the expansive natural areas in the state and the recent push for further resource protection, employment should remain steady or increase.

Overview

The "Alaska Career Guide 1987" lists "fish and game protection officers" as a category. The publication states that these officers will "enforce laws and regulations designed to protect and conserve fish and wildlife. [They will] warn, cite or arrest individuals suspected of violations. [They] may seize the fish, game, and equipment connected with the violation. [They will] collect information on the condition and numbers of fish and wildlife in the area. [They will] patrol by boat, plane or foot." Opportunity is limited with 150 employed. Salary is $1,900 to $3,400 per month. The publication continues: "To compete for state and federal jobs, applicants must have some experience in law enforcement or college education and be on the appropriate registers. All people currently being hired have several years of law enforcement experience. An associate or bachelor's degree in biology, wildlife, or conservation is helpful. [They] must meet strict physical requirements and background check for fitness of character." ("Alaska Career Guide," p. 32) Entry-level Fish and Wildlife Protection Aides serve as stream guards in many areas of the state.

Suggested Learning Activities

1. Students review Fish & Game regulations in small groups and share what is learned.
2. Invite a Fish & Wildlife Protection Officer or Village Public Safety Officer to class to discuss job requirements, training experiences.
3. Students visit a law enforcement establishment. Find out how officers are trained, previous background, physical requirements. Ask officers to describe procedures used in enforcing fish & wildlife rules and regulations.
4. Students write to enforcement agencies to find out more about training and requirements for law enforcement, as well as the daily responsibilities .
5. Role play interactions between officer and violator: document violation clearly in writing, discuss violation, write ticket, inform supervisor, obtain assistance and make arrest. Caution, warn, and cite violator.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802

Fish and Wildlife Protection, State of Alaska, 5700 East Tudor Road, Anchorage, AK 99507 (907) 269-5509

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books:

Park Ranger Handbook, J.W. Shiner, 1986, Venture Publishing, Inc. 1640 Oxford Circle, State College, PA 16803. *Excellent text. Deals with virtually all areas of the job of park ranger.*

Law Enforcement

Do I need to know the fish and game laws?

The law enforcement officer should be very knowledgeable about fish and game laws. An important area in law enforcement is *authority* and *credibility*. As an authority, you will need to model compliance with the law yourself. Modulated behavior, reflecting your respect for the law, for the public, and for yourself is best. Law enforcement officers must obtain a law enforcement *commission*. This commission entitles you to wear a badge and trains you to work in local, state or federal law enforcement. A part of that training includes familiarity with fish and game laws.

What kind of law enforcement studies do I need to get into this field?

Fish and Wildlife Protection lists as minimum qualifications "Possession of a Basic Police Certificate from any state recognized by the Alaska Police Standards Council as equivalent to an Alaskan Basic Certificate.

OR

Successful completion of a Police Academy which provides the required academic training to obtain a Basic Certificate from the State of Alaska. A course description including hours of training and subject matter should accompany your application.

OR

Six months experience as a Fish and Wildlife Aide or as a Village Safety Officer with the Department of Public Safety which included successful completion of a police training course which meets division specifications. Note: a certificate of completion should accompany your application." Other jobs in this area include those for federal agencies. The U.S. Fish and Wildlife Service states that to qualify for a Special Agent (Wildlife) position you must have previous experience in the investigation and enforcement of fish and wildlife laws. Law enforcement experience is also important to work as a ranger for the U.S. National Park Service.

How do I deal with the public in this capacity?

Dealing with the public is an important part of the job of law enforcement officer. Obviously if no one committed any violations your job would be a lot easier. But conversely, if it weren't for the people, you wouldn't have a job. The job of any law enforcement officer is *compliance*. Compliance is getting people to obey and abide by the law. The skill of a law enforcement officer is how well he or she obtains this compliance. If you can attain compliance with a minimum of effort and you don't make anyone mad, you're doing your job. Conversely, if everybody likes you and they don't obey the law, you are failing at your job. Public relations are important in this field, and personal integrity is important. The law enforcement officer is high profile. Your personal conduct both on and off the job reflects very much on your performance of your job.

As a law enforcement officer, you will need to exhibit courtesy. J.W. Shiner notes that courtesy is exhibited through:

- choice of words
- tone of voice
- manner of walking or stance
- facial expressions
- use of hands

You will need to be courteous on the phone, with simple cases such as lost and found, and courteous when delivering unpleasant messages. You will need to offer information without appearing haughty. (Park Ranger Handbook, pp. 3-1 to 3-4)

How do I report or record wildlife violation information?

First of all, as any fish and wildlife or other law enforcement officer dealing with wildlife can tell you, if you can obtain compliance *before* the violation takes place, you have done your job all the better. In the course of meeting the public or during routine visits, you can

- caution those involved in minor violations of the consequences of their actions, thereby seeking voluntary compliance
- issue warning or citation under state (or federal) rules and regulations, as appropriate
- inform supervisor of observed or suspected violations and obtain assistance as appropriate
- arrest, if so empowered, and hold for assistance (or process in the normal manner)

Typically wildlife violations you witness can be reported on standard forms. If you don't have a form, note the time of the observation, place, nature of the violation, any witnesses, and photos and/or sketches of evidence. Leave the scene as you found it, guard it if possible, and investigate according to your training or contact someone who can conduct such an investigation. Also, the Alaska Department of Fish and Game asks that if anyone sees or hears of a fish or wildlife violation they should report it. You simply call the operator and ask for (800) 478-3377. These calls remain anonymous.

Do I need to observe laws and regulations myself?

Absolutely. One of the necessities of employment as a law enforcement officer is obeying and following the law yourself. In Alaska in many rural areas the only law is the Fish and Wildlife officer. That person not only must investigate fish and wildlife violations, but he or she must also investigate criminal and some civil violations as well. Just like a law enforcement officer anywhere, that person is under the scrutiny of the community. Authority and respect are the pillars of employment in law enforcement.

What laws and regulations pertain to land use?

Many laws and regulations in Alaska direct land use. Different agencies have jurisdiction over different areas, however. For example, the shoreline falls under the management of the U.S. Army Corps of Engineers. Federal land falls under the management (and regulations) of the agency responsible for that land. Much of the interior falls under the jurisdiction of the Bureau of Land Management. That agency has particular regulations which relate solely to those B.L.M. lands in Alaska. These regulations are found in the CFR (Code of Federal Regulations), which you will find at any of these federal offices. Borough lands fall under borough rules and regulations (including zoning laws). Air and water pollution falls under the administration of the Environmental Protection Agency and the Alaska Department of Environmental Conservation.

What laws and regulations deal with wildlife and plants?

Then there are layers of agencies dealing with various land and water designations in the state. Usually one agency also knows and can relate the laws and regulations of another agency. Law enforcement officers carry books of rules and regulations with them, and have books in their offices related to those laws. Part of the job of the rookie officer is to become thoroughly familiar with the laws they have to enforce. Nothing is more disturbing to the public than fish and wildlife officers either breaking the law themselves, or not being familiar with the law they are supposed to enforce.

Are there any tricks to writing a citation?

That can be difficult. You may be citing someone with whom you can fully identify. You may not want to do it, but it will be your duty. Citing someone is not the end of the world. The law is the law and asks for compliance. If you can obtain compliance from someone without citing them, all the better, but if you can't do that, you must cite the offender who in turn must pay a fine for the infraction.

Define the Resource

Basic Principles of Biology
Teacher Page

Competency: Understand basic principles of biology

Tasks:
Describe the basic biology of cells
Explain important principles of organic chemistry
Explain basic anatomical systems
Contrast biogenesis and spontaneous generation
Identify the parts of the cell
Explain the biosynthesis of carbohydrates
Differentiate cell behavior in different solutions
Compare photosynthesis and respiration
Describe the replication of DNA
Describe the phases of mitosis
Explain Mendel's Law of Segregation
Explain the theory of natural selection
Name important groupings of living things and the system of classification

Introduction

Many jobs concerning wildlife require familiarization with scientific procedures. Many fish and wildlife technician jobs, though under the guidance of a wildlife biologist, involve some familiarity with scientific procedures. Stiff competition has forced many candidates for technician jobs to seek further college training. Basic understanding of living processes lends itself to working in this area. A background in biology may lead to a position as a fish and wildlife technician, which may pave the way to a career in maintenance or administration. The study of biology may contribute or lead to jobs related to wildlife.

Overview

A number of jobs relate to basic principles of biology, including Fish and wildlife technician, park ranger, park technician, and biologist. Principles of biology give a student a strong background in the natural sciences. This background is virtually a must for those dealing with wildlife in a host of capacities. Scientific procedures pervade agencies like the U.S. Fish and Wildlife Service. The agency bases many of its decisions on thorough scientific studies. Jobs such as fish and wildlife technician, laboratory tester and plant scientist (all found in the "Alaska Career Guide" all relate to this area. The U.S. Fish and Wildlife Service lists in its "Careers" section of the "Employment Opportunities" brochure the jobs of wildlife biologist, fishery biologist, research positions, aids and technicians, and district field assistants. Other jobs they list include refuge manager, special agent, and pilot. Some positions are available only in the summer. Some allow the substitution of experience for college training. Though many of these jobs have limited opportunities, Alaska will continue to employ hundreds of workers in all these positions. For example, the "Alaska Career guide" lists 200 fish and wildlife technicians employed statewide. Employment in this field might lie in areas not usually expected. For example, the North Slope Borough employs local people in collecting whale census data. This research has been approved and accepted by the International Whaling Commission (IWC).

Suggested Learning Activities

1. Students examine and draw various plant and animal cells viewed under a microscope, labelling features and organelles in as much detail as possible. Students compare and contrast plant and animal features.
2. Using a microscope, students experiment with distilled water and salt water outside of cells to answer these questions: What happens using the two solutions? Why?
3. Students draw detailed, neatly-labelled posters illustrating the comparison between a plant and animal cell. OR: Students make models of each, labelling all parts clearly.

4. Students conduct research and stage a debate on spontaneous generation versus biogenesis.
5. Students research and replicate Francesco Redl's experiment disproving spontaneous generation (meat in jars "yields" maggots.)
6. To understand diffusion: Students drop food coloring into a beaker of water and watch it spread from a dark, condensed mass of color to an evenly-distributed pale solution. How did that happen?
7. To understand osmosis: Students put corn syrup in a cup, covering it with muslin, fastened tightly with a rubber band. Students suspend the cup upside-down in a beaker of water and observe the sugar solution moving from inside of the cup into the water in the beaker. (The water also moves from the beaker into the cup.)
8. Students draw a poster or diagram illustrating the relationship between photosynthesis and respiration, labeling all products and reactants.
9. Students conduct further research on Mendel's Law of Segregation, replicating his studies on a smaller scale.
10. Students observe a prepared slide of an onion root tip through a microscope, finding cells in all stages of mitosis and draw ing and labelling all stages. Students write a description of what is happening in each.
11. Large group (10 or so): Students plan and perform a short skit in which group members act out (panto-mime) parts of the cell during mitosis. Audience task: Remaining students call out names of phases, what is happening as each phase presented; give support through applause.
12. Students compare features in drawing and photographs of embryonic development of fish, amphibians, reptiles, humans. How are they alike and different?
13. Students research and debate evolution versus creationism.
14. Adaptation: (natural selection): Project Wild: "Who Fits Here?"(Students identify life forms adapted to different ecosystems), page 87; "Which Niche?"(Students compare careers with ecological niches), page 151; "Birds of Prey," (Students graph and interpret given data), page 217; "Polar Bears in Phoenix?"(students design an enclosure for polar bears), page 105; "Muskox Maneuvers," (Students simulate interactions between predator and prey species),page 99; "Here Today, Gone Tomorrow,"(Students classify animals, research, list endangered animals), p. 115; "I'm Thirsty!" (Students use given data in calculations related to wildlife adaptations), page 219.
15. Classification: Students use taxonomic keys to classify several plants and animals and describe the organism's kingdom, phylum, class, family, genus, and species.
16. Organic chemistry: Students make rod-and-ball models of various important biological molecules: water, carbon dioxide, carbohydrates (sugars, starches, celluloses), proteins, lipids (fats), nucleic acids.
17. Students draw neatly labelled color diagrams or posters illustrating the replication of DNA.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

American Institute of Biological Sciences, 1401 Wilson Blvd., Anington VA 22209

Arctic Environmental Information and Data Center, (A.E.I.D.C.), 707 A St., Anchorage, AK 99501

Scavengers, Science Education Supplies, P.O. Box 211328, Auke Bay, AK 99801. *Outstanding collection of school supplies related to biological sciences.*

Books:

Life Science, Richardson, Harris and Sparks, Silver Burdett Company, Morristown, New Jersey, 1979. *A secondary life science text.*

Modern Biology, Otto and Towle, Holt Rinehart and Winston, New York, 1985. *A standard high school biology text.*

Modern Chemistry, Metcalfe, Williams and Castka, Holt, Rinehart and Winston, Inc., New York, 1970. *A basic high school chemistry text.*

Basic Principles of Biology

What basics do I need to know about cells?

According to Otto and Towle the cell theory states that "the cell is the unit of structure and function of all living things. That is, the cell carries on the processes that are characteristic of all living things. Cells arise only from other cells." (Otto and Towle, p. 54).

They continue: "Cells are very complex and vary in size and shape. Each cell is surrounded by a cell membrane or plasma membrane. This flexible membrane separates the inside of the cell from its surroundings. In some cells such as the amoeba, this membrane is very flexible and the amoeba may change its shape. Another characteristic of cells, except those of bacteria and the blue-green bacteria, is that they each contain a large oval or spherical body. This is the **nucleus**. The nucleus is the control center for all cell activity... The **cytoplasm** consists of the cell material between the nucleus and the cell membrane. Small structures in this area are suspended in the cytoplasm. "All cells are not identical, but the membrane, nucleus, and cytoplasm are common to most cells. Studies using cell fractionation and the electron microscope show that many cells also contain **organelles**. Organelles are the structures within a cell that take part in carrying out the cell processes. Some cells, however, carry out the life processes without organelles." (Modern Biology, p. 56-57).

What are some important principles of organic chemistry?

As Metcalfe, Williams and Castka note in Modern Chemistry, "Carbon has been known from earliest times in the forms of charcoal and soot. In abundance, carbon ranks eleventh by weight among the elements in the earth's crust. In importance, it ranks far higher than this. It is present in the tissues of our bodies and in the foods we eat. It is found in coal, petroleum, natural gas, limestone, and in all living things. In addition, hundreds of thousands of carbon compounds have been synthesized in laboratories. The study of carbon compounds is so important that it is a separate branch of chemistry called *organic chemistry*. Originally, organic chemistry was defined as the study of materials derived from mineral sources. We have known for over a century that this is not a clear distinction. Many substances identical with those produced in living things can be made also from mineral materials. As a result, *organic chemistry today includes the study of carbon compounds whether or not they are produced by living organisms.*

"In most substances containing carbon, the carbon is present in the *combined* form. It is usually united with hydrogen or with hydrogen and oxygen." (Modern Chemistry, p. 321)

Compounds of carbon can be very simple or very complex. Carbon is the element with the atomic number 6. Diamonds, graphite, charcoal, and coke (used in making steel) contain or are made of carbon. So is carbon dioxide, an important component of air. Carbon dioxide is necessary for photosynthesis. Photosynthesis is the basis of the plant cycle. As such, carbon, in the form of carbon dioxide, is one of the foundations of the food chain through plants.

Carbon atoms can link together in long strings. The same atoms can be linked together in various ways. These different compounds, all with the same molecular formula but with different structures, are called *isomers*. As Metcalfe, Williams and Castka note, "the three largest groups of naturally occurring organic compounds are fats, carbohydrates, and proteins. These three types of materials make up most of the organic matter of living cells.

"Protoplasm, the basic material of living things, contains 75-90% water plus substances either in solution or in suspension. Oxygen, hydrogen, nitrogen, and carbon constitute about 96% of the total weight of protoplasm." (Modern Chemistry, p. 377) Protoplasm is the material of which cells are made.

What is the biosynthesis of carbohydrates?

As Otto and Towle continue:

"The building of organic molecules by living organisms is known as **biosynthesis.** Living things synthesize many kinds of organic compounds. Some of the simple compounds are used as building blocks to form large complex molecules called *macromolecules*. The macromolecules are essential for life. They fall into four classes: carbohydrates, proteins, lipids, and nucleic acids.

"**Carbohydrates** are made of carbon, hydrogen, and oxygen. The proportion of hydrogen atoms to oxygen atoms is two to one, as in water. Examples of carbohydrates are *sugars*, *starches*, and *celluloses*. These substances are found in most plant cells." (Modern Biology, p. 42)

What is the difference between biogenesis and spontaneous generation?

As Otto and Towle state in **Modern Biology:**

"From ancient times until less than a century ago, most people believed that certain nonliving materials could change into living organisms. It was thought, for example, that rotting meat could produce flies. This concept is called **spontaneous generation** or **abiogenesis.**

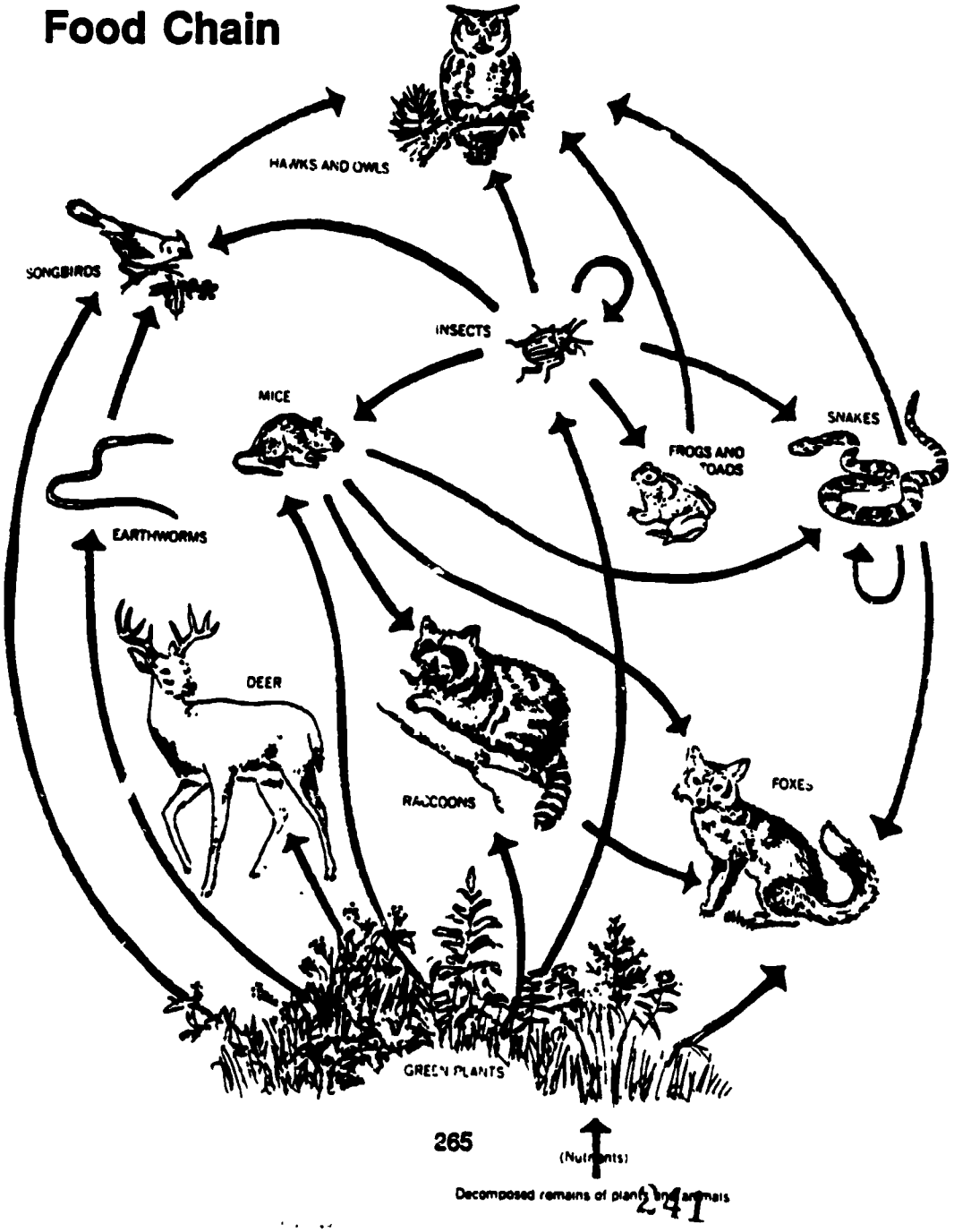
"Many stories of spontaneous generation had to do with smaller animals such as insects and worms. The stories were told because people in early times had little knowledge of how such animals grew and developed. The life histories of larger, domestic animals were easily observed. Not many people had observed the smaller organisms, however. One of the strangest stories came from the Belgian doctor Jean an Helmont some three centuries ago. According to van Helmont, a dirty shirt placed in a container of wheat would produce mice in 21 days. " Some scientists in the 17th century questioned spontaneous generation. Later in the 19th century, Pasteur, the great French scientist sealed the fate of this theory once and for all.

From Pasteur's time to the present, all experiments indicate that life comes only from life. Biologists call this the principle of **biogenesis.** Though all the evidence argues for it, biogenesis actually is a fairly new idea. It is now a firmly established theory." (Modern Biology, pp. 22-25)

How does cell behavior differ in different solutions?

Cells react and interact with the solutions in which they are placed or found. Molecules can diffuse through cell membranes. Osmosis is the diffusion of water through a selectively permeable membrane from an area where the water is more concentrated to an area where the water is less concentrated. Osmosis plays a very important part in the lives of organisms. As water diffuses into the cell by osmosis, pressure builds up within it until the cell reaches equilibrium with the solution around it.

Animal cells do not have cell walls. They constantly pump water in and out. Animals excrete excess water and undissolved wastes as urine. In nature water contains minerals and other dissolved substances. Mineral content lowers the concentration of water molecules. Distilled water, on the other hand, has very close to a 100-percent concentration of water molecules. If one-celled animals are placed in distilled water, they can swell and burst because the water molecules diffuse into the cell where the water is less concentrated. The solution cells are placed in determine the behavior of the cell. (Modern Biology, pp. 74-75)



What do I need to know about basic anatomical systems?

Background in anatomy and biology is useful in many facets of work with wildlife.

Animals are grouped by whether they have a backbone or not. Those without backbones are called *invertebrates*. Conversely, those with backbones are called *vertebrates*. Animals with backbones include the fishes, amphibians, birds, reptiles and mammals. They also have these body systems. The degrees of development and characteristics of that development differs for each animal. Animal anatomy differs in individual cells, in patterns of development, in symmetry (how their body parts are arranged), and in their body systems: digestive, circulatory, respiration and excretion, nervous, immune, muscular, and reproductive. All these systems can be impacted by habitat and the environment. Technical jobs related to wildlife will involve some understanding of those basic systems. A course in biology and/or anatomy is a good place to gain that background.

What happens in photosynthesis and respiration?

Photosynthesis is the process in which carbon dioxide and water, using energy from the sun, are used to form glucose, a plant food. Respiration is a process in which glucose is broken down and energy is released. These two processes make up the carbon-oxygen cycle. They are processes basic to life. As Otto and Towle note, "both plants and animals respire. Only green plants photosynthesize. During cellular respiration glucose is oxidized and carbon dioxide is released. During photosynthesis green plants use water, carbon dioxide and energy from the sun to make oxygen, glucose, and water.

"When plants and animals die, the organic compounds of which their bodies are made are broken down by microorganisms. One of the end products that eventually forms is carbon dioxide.

"Another source of carbon dioxide in modern societies is the burning of fossil fuels. The carbon compounds of many ancient plants and animals were stored in the form of coal and petroleum. As these fuels are burned, carbon dioxide is released into the atmosphere. Carbon thus travels in a full circle, from CO_2 in the atmosphere, to glucose, and back again to CO_2. (Modern Biology, p. 707)

What is the replication of DNA?

Deoxyribonucleic acid (DNA) is a nucleic acid which controls the activities of the cell. It is DNA which contains the information which causes a cell to operate, and to divide and join with other cells to form organisms. DNA replicates or copies itself. As Otto and Towle state, "One remarkable thing about the DNA molecule is that it can build an exact copy of itself. This process of duplicating itself is known as *replication*. During replication, enzymes break the weak hydrogen bonds between the bases of the nucleotides. DNA separates into two halves, and this separation exposes the nucleotide bases to materials in the nucleus. There are many free nucleotides in the nucleoplasm. Each exposed base combines with a nucleotide that contains its complementary base. *Adenine* joins to *thymine*, and *guanine* joins to *cytosine*. An enzyme then joins the sugar and phosphate units of adjacent nucleotides. This process is repeated until two whole DNA molecules, each exactly like the original, are formed. "

What are the phases of mitosis?

The proper place for study of mitosis and other cellular-level biology is in a biology class. Mitosis is the process of cell division in which the chromosomes in the nucleus of the parent cell duplicate and divide into two identical sets. Those phases include the *interphase*, the period between cell divisions. Most cells spend most of their lives in this phase; the *prophase*, when the cell prepares to divide; the *metaphase* in which the chromosomes move toward the middle of the cell; and the *anaphase* in which portions of the chromosomes separate and begin to migrate; and the *telophase* when the chromosomes once again become thin threads of *chromatin* like they started. Cell division is the basis of life. (Modern Biology, p. 119-121)

What is Mendel's Law of Segregation?

The study of heredity is called *genetics*. Gregor Mendel was a 19th-century Austrian monk. He studied traits in plants and established laws describing the process of heredity. By experiments on a number of pea plants Mendel's conclusions included three hypotheses. Firstly, there is something in living things which control traits. He called them *factors*. Mendel concluded that inherited characteristics are controlled by factors that occur in pairs.

Secondly, he concluded that one factor in a pair may mask the other, preventing the other from having an effect.

Thirdly, he concluded that during the formation of reproductive cells the paired factors must separate. Thus each reproductive cell received only one factor of each pair. His third hypothesis states that a pair of factors is segregated, or separated during the formation of gametes (the beginnings of life). This law is known as Mendel's Law of Segregation.

Mendel's second law stated that factors (genes) separated and were distributed to gametes in a way completely independent of the other factor pairs. That means one trait is passed on or not passed on independent of another. (Modern Biology, p. 133)

As stated before, such subjects have definite bearing on those who study wildlife. Such subjects are within the realm of the study of biology.

What is the theory of natural selection?

A standard in junior high school and high school biology classes is Darwin's theory of natural selection. Some call this theory "survival of the fittest" and those who most strictly adhere to what this law states are sometimes called "Darwinists." To say that Darwinists believe that humankind derived from the apes is an over-simplification. Darwinists believe that natural selection has determined the origin of the species, that in fact the strongest survive. Natural selection states that the strongest, by surviving, are the ones to reproduce, and as such, pass their traits on to their offspring. The strongest of those offspring in turn survive, and by this means the characteristics of today's species has been determined. "Only the strong survive" might be a tenet of natural selection. Ideas of natural selection are sometimes used to advocate wildlife issues. For example, some scientists state that wolves take weak and sick moose, that the strong and able moose are the ones which survive, thus making moose herds stronger. Others find this theory too simple an explanation. As with most theories, at the very least it provides a good bit of discussion and circumspection.

Wild Celery
Ligusticum hultenii

Sourgrass
Oxyria digyna

What are some important groupings of living things and how are they classified?

A taxonomy is a system of grouping and naming things. Biologists today use a classification system developed by a Swedish scientist named Linnaeus. According to the text Life Science, "his method of grouping organisms is the basis of the classification system used today. In his system, the *Kingdom* is the largest group. Biologists

used to agree that there should be two kingdoms. These two kingdoms were the animal kingdom and the plant kingdom. However, there are thousands of organisms that are not clearly animals or plants. Today, biologist do not agree how these organisms should be classified. They do not agree how many kingdoms there should be. Some biologists say three; others say four or five. As more information is obtained, perhaps this problem will be solved.

"The *phylum* is the second largest major group used in classifying organisms. For example, each of the major groups of animals is a separate phylum. Arthropods make up one phylum. Mollusks make up another phylum. Within a phylum, the subgroups are, in descending order, *class, order, family genus* and *species*. Each of these groups has fewer and fewer organisms. The organisms in the group are more alike. For example, a genus has fewer members than a family. The members of a genus are more alike than the members of a family.

"When it is classified, an organism is given a scientific name. Linnaeus also proposed the system of naming organisms that is used today. This system of naming organisms is a binomial system. Binomial means two names. Both of the names are Latin names. The first name is the name of the genus to which the organism belongs. The second name is the name of the species to which it belongs. for example, the scientific name of the domestic cat is *Felis domesticus*. The cat belongs to the genus *Felis* and the species *domesticus*.

"Many people do not like using scientific names. The names are sometimes long and hard to pronounce. But using scientific names helps prevent confusion. Organisms may have different common names in different parts of the country. ...Organisms also have different names in different languages. The word for cat in French is *chat*. In Spanish, cat is *gato*. the use of scientific names provides a universal language. If the name *Felis domesticus* is used, everyone knows what organism they are talking about." (Life Science, pp. 526-527)

Wild Rhubarb
Polygonum alaskanum

Wildlife Principles, Definitions and Terms
Teacher Page

Competency: **Understand principles, definitions, and terms related to wildlife management**

Tasks: Describe management of:
a. upland game
b. fur bearers
c. sea mammals
d. waterfowl

Introduction

The understanding of any field involves terms and definitions. The field of wildlife biology has in the last 40 or 50 years emerged as a science in itself. In this regard, the management of wildlife populations in areas as diverse as Africa and South Asia have issues in common with Alaska. As wildlife management has become more of a refined science, advanced degrees have become more important for many specialized positions. Positions involving support, data collection, visitor services and law enforcement have provided employment for others with less specialized education.

Overview

Wildlife in Alaska employs a number of people, directly and indirectly. Fishing is the second largest industry in the state, and, after government, the largest employer. Wildlife is one of the primary attractions for visitors to the state. Knowledge of wildlife principles, terms, and definitions will prepare students for a number of jobs directly or indirectly related to the field.

Suggested Learning Activities

1. Students examine ADF&G game management plans and maps of game management units.
2. Invite a game biologist to class to describe the ongoing process of game management.
3. Students brainstorm reasons for managing resources.
4. Project Wild: "Bird Song Survey," p. 231; "Fire Ecologies," p. 111; "Planting Animals," p. 19; "Checks and Balances," p. 223; "No Water Off a Duck's Back," p. 119; "Cartoons and Bumper Stickers," p. 21; "Too Close for Comfort," p. 121; "Shrinking Habitat," p. 173; "To Zone or Not to Zone," p. 177; "Deadly Links," p. 123; "Planning for People and Wildlife," p. 187; "Can Do!" p. 201; "Improving Wildlife Habitat in the Community," p. 131; "Turkey Trouble," p. 227; "A History of Wildlife Management, " p. 155; "Deer Crossing," p. 183; "Cabin Conflict," p. 185; "Pro and Con: Consumptive and Non-Consumptive Uses of Wildlife," p. 33; "The Hunters, " p. 157.

Resources

Fish and Wildlife Protection, State of Alaska,5700 East Tudor Road, Anchorage, AK 99507 (907) 269-5509

National Marine Fisheries Service, Box 1688, Juneau, AK 99802. (907) 586-7221. *Manages marine mammals and fisheries outside between two miles and two hundred miles offshore.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books and Pamphlets:

Alaska Habitat Management Guide. Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

Alaska Mammals, Alaska Northwest Publishing Company, Box AA88, 130 Second Avenue South, Edmonds, WA 98020

"Alaska Trapping Regulations," No. 28, Alaska Board of Game, Alaska Department of Fish and Game. *Changes every year. Available from ADF & G or FWP offices or wherever licenses are sold.*

The Philosophy and Practice of Wildlife Management, Frederick F. Gilbert and Donald G. Dodds, Krieger Publishing, Malabar, Florida, 1987 *An involved college text concerning wildlife management.*

Study and Management of Large Mammals, Thane Riney, John Wiley & Sons, publishers, New York, 1982. *An involved but readable college text concerning wildlife management.*

Trapping and Conservation Manual, 1987, Alberta Forestry, Lands and Wildlife, Fish and Wildlife Division, Edmonton, Alberta, Canada T5K 2G6. *An outstanding manual, currently out of print. A copy is available from the Vocational Materials Library, Alaska Department of Education, Office of Adult and Vocational Education, P.O. Box F, Juneau, AK 99811*

Wildlife Principles, Definitions and Terms

How do we manage upland game?

Upland game includes the major game species so familiar to Alaskans: caribou, moose, deer, sheep, goats, wolves, and bear. Management techniques vary. Managers always have a goal in management, whether increasing harvest, increasing herd sizes, or protecting certain species. The Alaska Department of Fish and Game manages most upland game species.

The Alaska Department of Fish and Game formulates studies with goals and objectives. Studies are undertaken to collect data. Those data are analyzed and compiled into reports which go together into management plans. These management plans are reviewed and presented to the Board of Game which formulates hunting and trapping regulations (laws). The entire state is divided into game management units (you can obtain a map from any Fish and Wildlife Protection office or at ADF & G). Additionally, rules and regulations are based on these reports and plans, all of which are regularly updated and corrected.

Upland Game

Courtesy of Alaska Department of Fish and Game

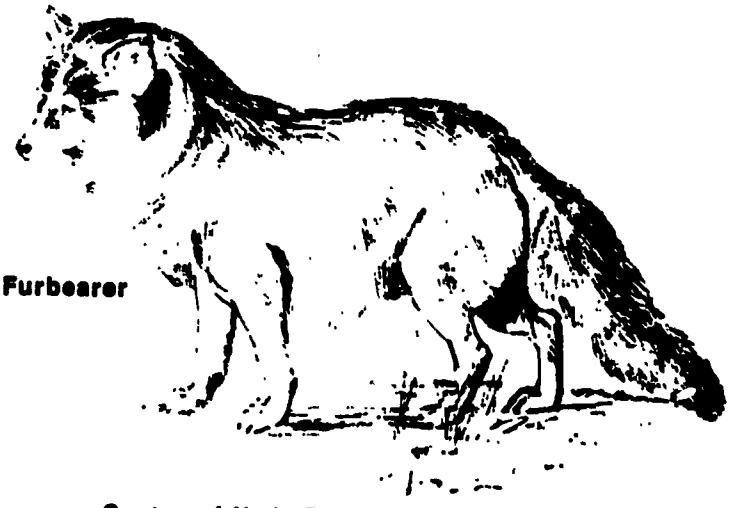
Management might involve maintaining populations, monitoring harvest, determining effects of human activities other than hunting, maintaining food supply, protecting habitat, minimizing adverse impacts, providing for sports hunting, working effectively with both urban and rural inhabitants of the area, promoting public involvement and education, and working with foreign entities. Results of this management include setting seasons, harvest limits, making recommendations on habitat protection, and making suggestions on development and other human behavior.

How are furbearers managed?

Furbearers are of value to the ecosystem as a whole, as contributing members of the food chain, to subsistence hunters for food and clothing, and to commercial trappers, who make a living from their harvest. Furbearers are managed through regulations.

As Alberta's Trapping and Conservation Manual, 1987 notes, regulations:

- Conserve the resource by preventing overharvesting
- Permit reasonable use of the resource and allow a fair opportunity for people to share in the harvest of the surplus crop
- Protect the users' (trappers') interests
- Minimize waste
- Help ensure animals are taken in a humane manner
- Protect people from property damage and diseases by controlling furbearer populations with desirable limits
- Lessen the chances of catching non-target animals



Furbearer

Courtesy of Alaska Department of Fish and Game

Trapping is managed by game management unit. These units are identifiable on Alaska Game Management Unit maps. These game management units are largely administrative. They also allow for better management of furbearers because regional differences can be taken into account and appropriate management applied. Seasons protect furbearing animals during breeding and rearing seasons. Seasons also attempt to encourage trapping when furs are at their prime, thus increasing the revenue to trappers. (Trapping and Conservation Manual, 1987, p. 180)

The same publication discusses not only management by agencies such as the ADF & G, but also the management of furbearers by the trapper. The trapper should note and respond to:

- Signs of overabundance or underharvest
- Signs of scarcity or overharvesting
- Signs of stability

The trapper may note the above by:

- Assessing habitat
- Assessing populations
- Recording observations

The trapper (and/or ADF & G) may respond by:

- Adjusting harvest levels
- Rotational trapping
- Artificial stocking (not commonly used in Alaska today)
- Salvaging the hides of nuisance animals, i.e. wolves, bear, etc.
- Timing the harvest
- Improving habitat

(Trapping and Conservation Manual, 1987, pp. 191-199)

How are marine mammals managed?

According to the Alaska Almanac, "marine mammals found in Alaska waters are: dolphin (Grampus, Pacific white-sided and Risso's); Pacific walrus; porpoise (Dall and harbor); sea otter; seal (harbor, larga, northern elephant, northern fur, Pacific bearded or *oogruk*, ribbon, ringed and spotted); Steller sea lion; and whale (Baird's beaked or giant bottlenose, beluga, narwhal, blue, bowhead, Cuvier's beaked or goosebeaked, fin or finback, gray humpback, killer, minke or little piked, northern right, pilot, sei, sperm and Stejneger's beaked or Bering Sea beaked).

Sea Mammal

Courtesy of Alaska Department of Fish and Game

"The Marine Mammal Protection Act, passed by Congress on December 21, 1972, provided for a complete moratorium on the taking and importation of all marine mammals. The purpose of the act was to give protection to population stocks of marine mammals that "are, or may be, in danger of extinction or depletion as a result of man's activities." Congress further found that marine mammals have "proven themselves to be resources of great international significance, aesthetic and recreational as well as economic, and it is the sense of the Congress that they should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and that the primary objective of their management should be to maintain the health and stability of the marine ecosystem. Whenever consistent with this primary objective, it should be the goal to obtain an optimum sustainable population keeping in mind the carrying capacity of the habitat.

"At the present time, the U.S. Fish and Wildlife Service (Department of the Interior) is responsible for the management of polar bears, sea otter and walrus in Alaska. The National Marine Fisheries Service (Department of Commerce) is responsible for the management of all other marine mammals. The state of Alaska assumed management of walrus in April 1976, and relinquished it back to the USFWS in July 1979. However, an amendment to the Marine Mammal Protection Act in 1981 makes it easier for states to assume management of marine mammals." (Alaska Almanac, p. 130) Today, the Alaska Department of Fish and Game works with federal agencies to develop management plans for marine mammals.

Is management of waterfowl different from management of mammals?

Management for waterfowl differs in a great many ways. Waterfowl are mobile. As such, the birds certainly don't respect borders, refuge boundaries, or international treaties. They go where they need to and where they traditionally have gone. Additionally, waterfowl in many cases migrate. Managers must deal with managers in other states and in other countries. They may be forced to react to situations which occur far away, outside of their control. Because of their mobility, diseased waterfowl can carry the disease to waterfowl in other locations. The concentration of waterfowl to protected refuges in the Lower 48, too, keeps waterfowl crowded together, increasing the chances that a disease can sweep through and affect a great number of animals. Some efforts have been made to disperse wildlife use of refuges. Gilbert & Dodds say that "the advantage lies with many small refuges instead of a few large ones." (The Philosophy and Practice of Wildlife Management, p. 76)

Waterfowl require wetlands. Though wetlands are plentiful in Alaska, protection for waterfowl in one area doesn't necessarily mean they will be protected elsewhere. In the Lower 48 and elsewhere, wetlands have been converted into industrial parks and other developments. Such pressures on wetlands and drainage of wetlands, along with the fragile nature of these areas all point to special management requirements for waterfowl habitat.

Canada Goose

Trumpeter Swan

Important Wildlife Quarry

Teacher Page

Competency: Know important wildlife quarry

Tasks:
Identify local and regional game animals
Identify major local and regional fur bearers
Recognize and interpret wildlife game laws, rules and regulations
Identify species of wildlife common to Alaska and classify them as game, non-game, endangered, or threatened
Describe the characteristics of given wildlife populations
Evaluate, improve, and maintain the habitat and physical condition of selected wildlife species

Introduction

The Game Division of the Alaska Department of Fish and Game regulates hunting. Every year the state publishes game regulations, finfish regulations, and subsistence regulations. A number of employees are involved in creating and implementing those rules and regulations.

Overview

Alaska is involved in hunting in many ways--subsistence, sport hunting, tourism, guiding, outfitting, backpacking and the various businesses involved. From sporting goods stores to hardware stores to taxidermy studios, wildlife as quarry (an animal that is hunted) is important in Alaska. It has been estimated that mountain goat hunters spend $350 per day of hunting. Familiarization with wildlife as quarry will assist in employment in a host of jobs.

Suggested Learning Activities

1. Students examine wildlife game laws, rules, regulations in small groups and report back to large group.
2. Alaska Wildlife Notebook Series: Students study relevant species in small groups and report back to large group. Students use data to construct cards and play "Habitat Rummy," p. 51, Project Wild.
3. Students learn about the process of regulation-making by attending meetings of the Alaska Board of Game or smaller sub-groups.
4. Alaska Wildlife Notebook Series and Alaska Wildlife Notebook Series Activities Guide for Teachers: p. 42: role play a meeting of the Alaska Board of Game to set up new furbearer regulations. (NOTE: This entire source is FULL of activities related to game species and regulations for their use.)
5. Invite game biologists to class to show slides of various local wildlife species.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator. This booklet is an absolute must for wildlife instructors.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books, Pamphlets, Videos:

"Alaska Fish and Game" Magazine and back issues. Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *Subscription one year, $9.00. Back issues: Pictorial, January–February 1987–Wildlife Week, May–June 1987–Big Game, September–October 1986. $2.00 each.*

Alaska Habitat Management Guide, Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

"Alaska Department of Fish and Game Wildlife Notebook Series," Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *A must for those who teach wildlife and related subjects. Collated sets, illustrated. 88 species of Alaskan wildlife. $5.00. Also "Activity Guide for Teachers" accompanies the Wildlife Notebook Series. $5.00.*

"Project Wild," *See ADF & G listing above.*

Important Wildlife Quarry

What are the species of wildlife common to Alaska?

Wildlife in Alaska might be classified as big game, furbearers, small mammals, marine mammals, birds, finfish, and shellfish.

Big game include:

- bison
- black bear
- brown bear
- caribou
- Dall sheep
- Roosevelt elk
- moose
- mountain goat
- musk ox
- polar bear
- Sitka black-tailed deer
- wolf
- wolverine

Furbearers

- arctic fox
- beaver
- coyote
- land otter
- lynx
- marten
- mink
- muskrat
- red fox
- wolf
- wolverine

Small Mammals

- hare
- lemming
- hoary marmot
- pika
- porcupine
- red squirrel

Marine Mammals

- beluga whale
- seals
- whales
- walrus
- sea otters
- sea lions

Birds

- ptarmigan
- grouse
- hawks and eagles
- Canada goose
- geese

Fish

- salmon
- arctic char
- arctic grayling
- burbot
- dolly varden
- halibut
- lake trout
- northern pike
- pacific herring
- rainbow trout
- sheefish
- whitefish

Shellfish

- abalone
- Dungeness crab
- king crab
- razor clam
- Tanner crab

Many other animals inhabit the state. The above list includes those either commonly used for food or sought out by visitors for viewing.

What about recognizing and interpreting wildlife game laws, rules and regulations?

It is the job of everyone to recognize wildlife game laws, rules and regulations. Responsibility falls on the violator, not on the law enforcement officer. For example, if you kill a dall sheep which doesn't have a 7/8 curl as required by Fish and Game regulations, saying you didn't know about the regulation is no excuse. You are responsible for knowing. Hunters know that; one of their first actions each year is to pick up copies of the current, updated regulations.

The responsibility of interpreting wildlife game laws belongs solely to the Board of Game and the court system. Fish and Wildlife Protection officers are able to clarify questions.

An important area to recognize is that Fish and Game employees, Park Service employees, U.S. Fish and Wildlife employees, Fish and Wildlife Protection officers, those working in Native organizations and for private concerns need to familiarize themselves with rules and regulations and abide by them. Only by special dispensation can those working on a research project or working for management agencies take actions that would otherwise be illegal.

How can I learn about a given species of wildlife?

Knowing characteristics of given wildlife populations in your area is useful in a number of ways. You could interpret the wildlife to visitors; you would have some familiarity with animals other than those you hunt or study. The Alaska Department of Fish and Game's "Wildlife Notebook Series" offers a good general overview of wildlife in the state.

How can I evaluate, improve, and maintain the habitat and physical condition of selected wildlife species?

Large studies are made, attempting to evaluate, improve and maintain the habitat and physical condition of a number of animals. Protection of habitat can take place in a subtle manner, through establishment of conservation areas, particularly those of vital importance to wildlife. Robert Weeden notes that wildlife managers would seek a "high level of land use control":

- If a species is in danger of extinction, and if control of land would increase the animal's chance of survival. For example, Aleutian Canada geese, an endangered species, has special protection on the Aleutian chain
- If a relatively abundant species moves seasonally to a small area where it is vulnerable to massive mortality.
- If demand for a species is concentrated in a small part of the species' range. For example, hunting is controlled near cities. ("Wildlife Management and Alaska Land Use Decisions," pp. 3-4)

Special projects to inoculate or remove diseased wildlife are occasionally undertaken, for example with rabid mammals in certain locales. Another local example is application of a drug to wolves on the Kenai Peninsula to kill lice that were destroying the wolves' fur, making them sick and of no value to trappers.

Characteristics of Birds
Teacher Page

Competency: Know characteristics of birds

Tasks: Describe:

a. what makes birds different from other groups of vertebrates
b. pigmentation changes in birds
c. the molting process in birds
d. bird migrations
e. bird imprint behavior
f. bird sexual display behavior
g. bird breed parasitism
h. the process of egg production and incubation
i. the process of bird care of young

Introduction

Wildlife employment related to birds is generally limited to those having college background in this field, though those who work as fish and game technicians, fish and wildlife technicians, park technicians or as technicians for private scientific concerns might have some work related to birds. Additionally, interpretive workers with tourists as well as other guiding work would benefit from a knowledge of birds. Visitors often have a great interest in natural history.

Overview

The "Alaska Career Guide" states of biologists: "[they] study living organisms, including their origin, identification and classification, structure, physiology, diseases, and behavior. Most of the biologists in Alaska are employed as fisheries, wildlife, or habitat biologists. ...A bachelor's degree is adequate preparation for some beginning jobs; however, those interested in a career in this field should plan to obtain an advanced degree due to intense competition for most biological jobs. A doctoral degree generally is required for college teaching and independent research." It should be noted that a basic background in biological sciences is applicable directly or indirectly to other jobs, for example, interpretive and guiding jobs.

Suggested Learning Activities

1. Migration: Alaska Wildlife Notebook Series and Alaska Wildlife Notebook Series Activities Guide for Teachers: p. 87. Students prepare a neatly-labelled color map of the migration routes, wintering, and nesting ranges for the six subspecies of Canada geese.
2. Feather pigmentation: Students examine study skins and feathers from various species of birds (museum and local biologists' collections) and determine which colors are from pigments and which are derived from feather structures interacting with light.
3. Molting: Some birds lose all of their primary feathers at once, rendering them temporarily flightless. Others molt in stages. Students role play a predator-prey relationship for a synchronous (quick-molting) species and for a slow-molting species and discuss advantages and disadvantages of each type of molt.
4. Bird behavior as advertising: Students cut bird photos from magazines, mounting them neatly with captions creating "advertisements" for individual birds.
5. Small groups: Students write scripts for skits dramatizing the plight of the nestling brood parasite and act out skits in front of the class.

6. Incubation and care of young: Some birds are precocial; that is, their young are capable of dealing with the hazards of the world by finding their own food and moving about independently not long after hatching. Others are altricial; that is, they require food and protection from their parents for an extended period after hatching. Discuss the advantages and disadvantages of both of these lifestyles.
7. The Alaska State Museum circulates multi-media kits on bald eagles and peregrine falcon, containing a variety of hands-on materials and activities suited to all grade levels. Write the Museum for details or call 465-2901.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Alaska State Museum, 395 Whittier Street, Juneau, Ak. 99801. *Excellent multi-media kits available on a variety of topics , with materials and activities suitable for all grade levels.*

Books:

Alaska Habitat Management Guide, Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

The Alaskan Bird Sketches of Olaus Murie, Alaska Northwest Publishing Company, Box AA88, 130 Second Avenue South, Edmonds, WA 98020

The Audubon Society Encyclopedia of North American Birds, J.K. Teres, Alfred A. Knopf, New York.

BIRDS OF NORTH AMERICA, Golden Guide to Field Identification, Golden Press, New York, 1966. *A must-have classic. Color paintings of birds. Handy pocket-sized, inexpensive.*

A Guide to the Birds of Alaska, Robert Armstrong, Alaska Northwest Publishing Company, Box AA88, Edmonds, WA 98020

The Life of Birds, Joel Carl Welty, W.B. Saunders Company, West Washington Square, Philadelphia, PA 19105, 1975.

Characteristics of Birds

What makes birds different from other groups of vertebrates?

Birds are, in a way, an evolutionary link between the reptiles and the mammals. Birds are similar to the reptiles in that fertilization of eggs is internal but development of the embryo is external. (Both vertebrate groups lay eggs.) Reptiles and birds both have scales and other similar body features; however, unlike snakes, birds are covered with feathers. While reptiles are cold-blooded creatures whose body temperatures remain the same as their surroundings, birds are warm-blooded: their body temperatures remain constant, maintained by the insulation of their feathers. Birds and mammals both share the characteristic of being warm-blooded; in addition, birds must sit on their eggs so that their eggs remain warm until they hatch. Many groups of birds, like most mammals, care for their nearly-helpless young for some time, teaching them behaviors they will need for life on their own. This is very unlike the reptiles, who abandon their eggs once they've been laid. Birds have hollow bones to reduce weight for flying. Their aerodynamic shape helps them fly. They preen themselves to maintain waterproofing. Bird behavior involves a constant state of readiness for instant flight to seize food opportunities or avoid danger.

Unlike the mammals, however, birds have no hair and have no milk to feed their young. Because birds lay eggs, their young are also more vulnerable to predation than that of mammals.

What pigmentation changes occur in birds?

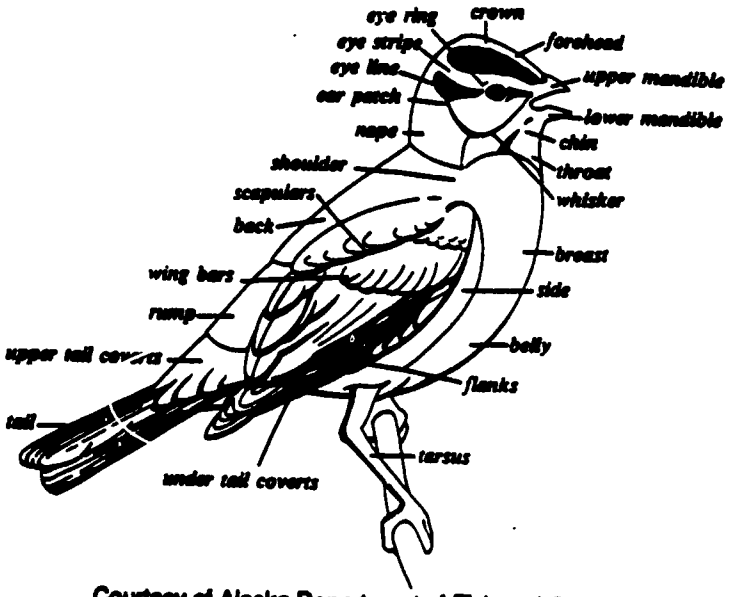
Pigments in birds are of two types: one produces black, dull yellow, red and brown colors. The other produces yellow, orange, and red colors. Once a feather is a certain color, it doesn't change, though the color can be dulled through abrasion, dirt or the bleaching effects of sunlight. Sometimes diet affects pigmentation as well as humidity, age, and sexual maturity. The main influences on bird coloration are seasonal and sexual.

Young bald eagles are mottled and lack the characteristic white head; adults are dark brown or black with the white head. Such pigmentation changes occur with sexual maturity. Pigmentation in ptarmigan changes with the seasons: in summer they are brown or mottled brown, in winter, white.

What happens when birds molt?

As feathers become worn, they loosen in their follicles and drop out, pushed by the already growing feathers underneath them. This process is called *molting*. Welty notes that the prime function of the molt is the replacement of worn feathers. In many species a partial molt, just before the mating season, provides brightly colored courtship plumage even though the old feathers do not need replacement. Molting may also help a bird stay clean–they can get rid of lice by replacing their feathers, for example.

Adult birds commonly molt and renew all or most of their feathers once a year, usually immediately after the breeding season. Molting occurs in patterns, specific to species. Some species have two molts and plumages a year, others only one. (The Life of Birds, p. 39-43)



Courtesy of Alaska Department of Fish and Game

Why do birds migrate and how is migration studied?

Birds have high metabolism. If you were to feel the heartbeat of a small bird, you would feel a rapid patter. Because they have such a high metabolism, they need ample food supplies. In areas with seasonal climatic changes, the birds must move in order to secure an adequate food supply. This movement is called *migration*. Birds are not the only migratory animals. Butterflies, caribou, whales and other species migrate. Conversely, some birds do not migrate at all.

Various methods are employed in studying migrations. One method is to identify birds at their breeding grounds with leg bands. Returned bands from hunted and recovered birds can supply information about migration. Some observations of bird migrations are made from aircraft, and an expensive method is to equip some birds with small radio transmitters. Radar may be employed to study migrations. Other studies include studying the "migration-restlessness" of caged birds. (The Life of Birds, pp. 463-465)

What are some characteristics of bird imprint behavior?

Imprinting is when a certain behavior is impressed into the mind or memory of animals. Birds have a remarkable capacity for imprinting, pointed out by Konrad Lorenz (1935), who with Oskar Heinroth noted how incubator-raised goslings would follow them around. Newly-hatched goslings will become attached to the first large moving object they see and promptly follow it as soon as they are able. Welty notes that different species of birds show varying degrees of imprintability. Typically a young bird imprints on its mother. This imprinting occurs during a critical period, usually just after birth. Numerous animal psychology experiments have taken place concerning imprinting; it gives us an insight into animal behavior. Welty notes that imprinting is a method by "to gather the extremely impressionable and vulnerable young around a tutor who immediately begins to teach them the hard facts of survival in an unfriendly world." (The Life of Birds, pp.184-188)

Excerpts from The Life of Birds, Second Edition, by Joel Carl Welty, copyright © 1979 by Saunders College Publishing, a division of Holt, Rinehart and Winston, Inc. reprinted by permission of the publisher.

What are some characteristics of the sexual display behavior of birds?

Welty terms bird sexual behavior as "inflexibly stereotyped." He notes that a "typical sequence in the reproductive behavior of the male starts with selecting and defending the nest territory. This may be followed by courting and pairing with the female, and then, in many species, helping her to build the nest and incubate the eggs. The final stage may involve helping to care for the young." (The Life of Birds, p. 147)

Courtship during the above sequence, is, according to Welty, "the province of the male. He shows his wares before the female with an astonishing assortment of tricks, varying according to species. He may posture so as to reveal his gaudiest nuptial plumage; spread his tail and erect his crest or inflate brilliantly colored pouches; parade, dance, fly with dizzying acrobatics; sing his most fetching songs (which to man may be discordant squawks); bring tidbits of food–anything, it seems, to impress his mate-to-be." (The Life of Birds, p. 250) Sometimes a bird can lose a considerable amount of weight in these courtship rituals.

Welty notes that finding a mate is only one part of the display behavior. "In many species the songs and displays of courtship serve primarily to warn away intruders and competitors from the owner's territory," he states. Additionally, he notes that display behavior may stimulate ovulation in female birds. Display behavior may also synchronize the sexual readiness of the pair, that is awaken sexual interest at the same time. (The Life of Birds, p. 249-251)

Characteristics of bird sexual display include:

- song
- contact
- posture
- dance rituals
- group behavior
- courtship flights
- fighting
- courtship feeding
- billing
- other behavior such as "pretend" nest building

(The Life of Birds, pp. 244-264)

What are some characteristics of bird brood parasitism?

Sometimes birds (of the families *Anatidae, Cuculidae, Endicatoridae, Icteridae* and *Ploceidae)* purposely lay their eggs in the nests of other species and abandon them to be raised by the other species. This strategy is called *brood parasitism.* No one is sure where or how this behavior started. Various theories have been put forth to explain this behavior.

Excerpts from The Life of Birds, Second Edition, by Joel Carl Welty, copyright © 1979 by Saunders College Publishing, a division of Holt, Rinehart and Winston, Inc. reprinted by permission of the publisher.

What is the process of egg production and incubation?

Much of what a bird embryo needs is supplied in the egg. Eggs are produced in nests, which are usually placed out of the reach of predators or other environmental hazards. Egg shells may be thick or thin, depending on the species of bird. Welty notes that the "size, shape, surface, and color of an egg often have additional value for a species." (The Life of Birds, p. 296) Eggs are laid as part of the reproductive cycle, which is under the control of the bird's endocrine glands. The time of egg laying may be seasonal, with optimum results found only during a certain time of year. There is a wide variation in the number of eggs different birds lay. Eagles lay three eggs, gulls and terns four eggs, snipe four to six eggs, ducks 9 to 23 eggs. This number is probably determined by heredity. (The Life of Birds, pp. 297-302)

Great variety is seen in the incubation patterns among birds. Welty states that male and female both participate in incubation. He notes that "a survey by Van Tyne and Berger (1959) of some 160 families, representing the majority of living birds, showed that both sexes usually incubated the eggs in about 54 percent of the families, the female alone in 25 percent, the male alone in 6 percent, and the male, female, or both, in 15 percent. (The Life of Birds, pp. 317-318)

Great variety is seen in the incubation periods of various birds as well–from as little as 10 or 12 days in some woodpeckers to over 80 days for other birds. Welty notes that as a rule the incubation of larger birds is longer than that of smaller birds. No universally accepted rule for the varying periods of incubation seems to be found. (The Life of Birds, p. 328)

How do birds care for their young?

Welty notes a general pattern in the rearing of young birds: "they hatch out, are fed by the parents, are protected from enemies and from the elements, and finally are feathered and fly off to live their own lives." (The Life of Birds, pp. 244-333)

Welty further notes that in regards to maturity at hatching, there are two types of birds: *precocial*, those which hatch out "covered with down, legs well developed, eyes open and alert, and soon able to feed itself; and *altricial*, those which are born naked, or nearly so, usually blind, and too weak to support itself on its own legs." (The Life of Birds, p. 333)

According to Welty, " as soon as they emerge from the shell, young birds are brooded by the parents to dry their down, if they have any, and to warm and shelter them against the elements. If the young are precocial, they are soon led away from the nest to a suitable spot where they shortly learn to feed themselves." (The Life of Birds, p. 335) Rearing varies widely for different species; differs in the types of food, the methods of feeding, the timing of the feeding, the stimuli for feeding, the frequency and amount of feeding, and the work expended by parents in feeding the young. Nest sanitation varies among species, as does brooding (covering with the wings or pulling into the body) the young. Young birds are defended in varying ways, and they defend

themselves in varying ways, by cowering in the nest, for example. Parents may, when the young is threatened by a predator, feign a broken wing to draw the predator away, or openly attack the intruder. Many birds practice cannibalism, treating the young from other nests as intruders. Once killed, these young may be eaten. (The Life of Birds, pp. 333-353)

The duration of the nesting period varies, as Welty notes that "not only is the length of time that the altricial young stay in the nest correlated with the length of the incubation period (long incubation, long nestling period), but also with the size of the species, larger species having longer nestling periods." (The Life of Birds, p. 355)

Finally, with the education of the young, much of the acquired skills for adulthood come through instinct to birds. Other skills are learned through trial and error, for example, what on the ground is food and what is pebbles. Sometimes parents seem to be teaching their young, for example, marsh hawks may give their young practice in catching prey by dropping a mouse in midair. Adults sometimes instruct through modeling. As Welty states, "imitation plays a role in the education of the young." (The Life of Birds, pp. 354-355)

Bird Populations

Teacher Page

Competency: Know bird populations

Tasks: Identify:

a. bird species important to hunters
b. important game waterfowl
c. important upland game birds
d. birds of prey and explain laws relating to them
e. perching birds

Introduction

Biologists, fish and wildlife technicians, park rangers, park technicians, interpreters and tourist guides concern themselves with bird populations. As those who work in the tourist industry in an outdoor setting relate, visitors are interested in birds. In a recent phone call, Robert H. Armstrong, author of Guide to the Birds of Alaska related that he receives regular phone calls asking for references for naturalists and bird-watching guides.

Overview

The job of dealing with bird populations falls within the above occupations, though the "Alaska Fish and Game Magazine" notes that for visitors "bird watching–apparently in the more casual sense of observing birds and wildlife as visitors go about their Alaska travel–was the activity *with the second highest participation overall.* Obviously, knowledge of bird populations relates to jobs in the visitor industry.

Suggested Learning Activities

1. Species identification and regulations for hunting of birds, birds of prey, perching birds: see activities listed previously under "Important Wildlife Quarry."
2. Alaska Wildlife Notebook Series and Alaska Wildlife Notebook Series Activities Guide for Teachers: Students design a survey to determine how important hunting of game birds is to students, p. 78; Students compare the feeding and other habits of hawks and eagles through a simulation game, p. 81.
3. Project Wild, "Bird Song Inventory," p. 2[illegible].
4. The Alaska State Museum circulates multi-media kits on bald eagles and peregrine falcon, containing a variety of hands-on materials and activities appropriate to all grade levels. Write to the Museum or call 465-2901.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

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U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Alaska State Museum, 395 Whittier Street, Juneau, Ak. 99801. *Excellent multi-media kits available on a variety of Alaskan topics , with materials and activities suitable for all grade levels.*

Books:

Alaska Habitat Management Guide, Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

Alaska Hunting Guide, Alaska Northwest Publishing Company, Box AA88, 130 Second Avenue South, Edmonds, WA 98020, 1979.

The Alaskan Bird Sketches of Olaus Murie, Alaska Northwest Publishing Company, Box AA88, 130 Second Avenue South, Edmonds, WA 98020

The Audubon Society Encyclopedia of North American Birds, J.K. Teres, Alfred A. Knopf, New York.

Birds of North America, Golden Guide to Field Identification, Golden Press, New York, 1966. *A must-have classic. Color paintings of birds. Handy pocket-sized, inexpensive.*

A Guide to the Birds of Alaska, Robert Armstrong, Alaska Northwest Publishing Company, Box AA88, Edmonds, WA 98020

Bird Populations

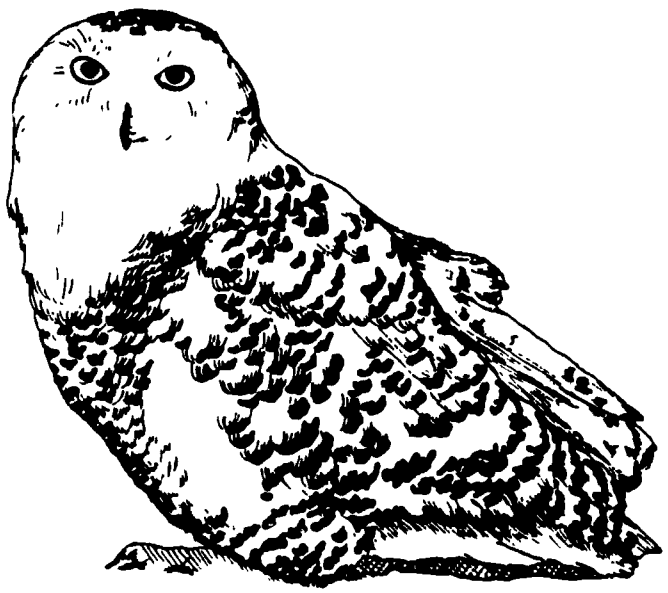
What are some bird species important to hunters in Alaska?

"Alaska Game Regulations" lists bag limits and seasons for the following species:

- grouse
- ptarmigan
- brant
- cackling Canada geese
- Canada geese
- cranes
- emperor geese
- ducks [this group includes pintails, mallards, wigeons, teals, shovelers, and gadwalls]
- sea ducks (eiders, scoters, old squaw, harlequin, and mergansers)
- snipe
- snow geese
- tundra swans
- white-fronted geese

The following species are listed as "unclassified". Some may be taken for eggs, food or clothing under special regulations. See "Alaska Game Regulations":

- cormorants
- crows
- magpies
- ravens
- snowy owls



What are some important game waterfowl?

As shown above, the important game waterfowl include the dabbling ducks (northern pintail, mallard, American wigeon, green-winged teal, northern shoveler, and gadwall) and the sea ducks (greater scaup, harlequin duck, oldsquaw, surf scoter, white-winged scoter, black scoter, Barrow's goldeneye, common goldeneye, buffle-head, red-breasted merganser, common merganser, Steller's eider, Pacific common eider, and king eider). Other important waterfowl include brant, geese (cackling, Canada, Emperor, snow, and white-fronted), snipe, and tundra swans.

No person may hunt for waterfowl in Alaska without having in possession an Alaska state waterfowl conservation stamp, signed across the face, unless that person:

(a) qualifies for a 25 cent license by having obtained state or federal assistance for the indigent within the past six months, or by having an income of less than $5,600 for the year preceding application.
(b) is a resident under the age of 16; or
(c) is an Alaska resident the age of 60 or over; or
(d) is a disabled veteran eligible for a free license under AS 16.05.341

In addition to the state waterfowl stamp, note that no person 16 years of age or older may take waterfowl unless that person has a current, validated, federal migratory bird hunting stamp (duck stamp) in possession." Each year duck stamps are available, beginning in August, at license vendors.

GROUSE

Courtesy of Alaska Department of Fish and Game, Wildlife Notebook Series

What upland birds are important game species in Alaska?

Upland game birds include grouse and grouse-like birds. These birds include the spruce grouse, found in the forests throughout Alaska. The ruffled grouse is found in the woodlands along the Yukon, Tanana, Kuskokwim and upper Copper rivers, and in the Taku and Stikine River drainages in Southeastern Alaska. The sharp-tailed grouse is found in about the same areas of Alaska as the ruffled grouse–with a range that includes the Yukon River valley from Canada to Holy Cross and the valleys of the upper Koyukuk, upper Kuskokwim, Tanana and upper Copper River. This bird is scarce in Alaska. The blue grouse is also called the "sooty grouse." It is found only in Southeast Alaska, from Glacier Bay south. The greatest numbers are found in the Juneau and Ketchikan areas. Alaska's state bird, the willow ptarmigan is found nearly everywhere in Alaska's high, treeless country. It lives close to the timber line, sometimes venturing among the trees. Rock ptarmigan are found in all major treeless areas of Alaska. White-tailed ptarmigan is limited to Southcentral and Southeast Alaska, although some may be found in the Brooks Range. (Alaska Hunting Guide, pp. 124-126)

What are the major Alaskan birds of prey?

The family *Accipitridae* includes the hawks, eagles, harriers, and ospreys. There are two types of eagles in the state—bald eagles and golden eagles. Other birds of prey (raptors) include owls, hawks, and falcons. A list of the birds of prey would include:

- Bald eagle *(Haliaeetus leucocephalus alascanus)*
- Golden eagle *(Aquila chrysaetos)*
- Northern goshawk *(Accipiter gentilis)*
- Sharp-shinned hawk *(Accipiter striatus)*
- Red-tailed hawk *(Buteo jamaicensis)*
- Swainson's hawk *(Buteo swainsonii)*
- Rough-legged hawk *(Buteo lagopus)*
- Northern harrier *(Circus cyaneus)*
- Osprey *(Pandion haliaetus)*
- Gyrfalcon *(Falco rusticolus)*
- Peregrine falcon *(Falco peregrinus)*
- American kestrel *(Falco sparverius)*
- Merlin *(Falco columbarius)*

Some less commonly-seen birds of prey include:

- White-tailed eagle *(Haliaeetus albicilla)*
- Steller's sea-eagle *(Haliaeetus pelagicus)*
- Eurasian kestrel *(Falco tinnunculus)*

Are there special laws relating to birds of prey?

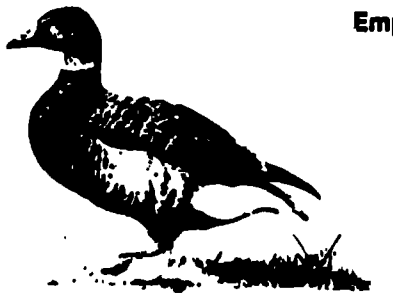
Yes. At one time birds of prey were considered nuisances, but since that time they have been recognized for their worth. Birds of prey, or raptors, eat rodents which devour crops. Though Alaska has little production agriculture, the state has a great number of rodents. Rabbits, hares, squirrels, and other small mammals live throughout the state.

All bald eagles are fully protected under the Bald Eagle Protection Act of 1940. In addition, Bald Eagles in the continental United States are protected as an endangered species. Bald Eagles in Alaska are not currently endangered, and the Alaska subspecies is not on the endangered species list. The state has no additional laws regarding bald eagles. Birds of prey are protected under federal law, with several exceptions (snowy owl eggs may be taken for food and their skins for clothing under special U.S. Fish and Wildlife Service regulation--but not for trophy mounts).

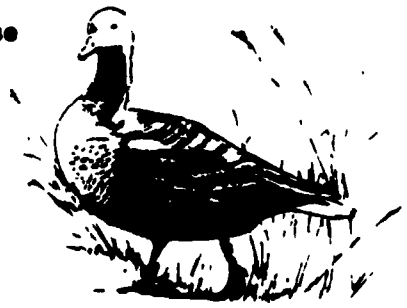
What other bird species are important in Alaska?

Alaska has over 400 bird species. One major group of Alaskan birds is the order *Passeriformes*–the perching birds. According to Birds of North America, Golden Guide to Field Identification, this order consists of medium to small land birds, all of which have feet well adapted for perching: 3 toes in front and one long one behind. Most are fine singers. Bill shape, feather colors and habits are most useful for family identification. Most insectivorous [insect-eating] species and some fruit and seed eaters are highly migratory.

Black Brant



Emperor Goose



Courtesy of Alaska Department of Fish and Game

Identifying Wild Plants
Teacher Page

Competency: Identify wild plants

Tasks: Identify major plant life in a given area and its relationship to other resources
Name and identify habitats of endangered plant species in Alaska
Describe the characteristics of plant populations
Evaluate, improve, and maintain the habitat and physical condition of selected plant

Introduction

Obviously all living things are dependent on plants. Though wildlife biologists may concern themselves primarily with wildlife, they cannot help but involve themselves with plants. Because plants are lower on the food chain, wildlife either directly or indirectly depends on plants to live.

Overview

Many naturalist tours involve plant identification. Amateur classes in uses of plant keys, wild and edible plants and tree identification are available nearly every year in various locations in Alaska. A specific job dealing with plants is that of plant scientist. The "Alaska Career Guide" says of the plant scientist: "[They] study plants and their environment to develop and enhance their usefulness to humanity. Agronomists develop methods to improve the characteristics, hardiness and yield of field crops. Plant pathologists study causes and ways to prevent and control plant diseases. Horticulturists develop new varieties and methods of growing flowers, fruits, vegetables and shrubs." Employment is limited with 40 jobs statewide. Knowledge of local plants, however, aids in jobs as fish and wildlife technician, and jobs in interpretation, guiding and outfitting.

Suggested Learning Activities

1. Invite a local botanist to class to talk about and show slides relating to identification of local plants.
2. With a local expert, students identify as many plants as possible in the field, using keys and field guides, then collect representative specimens, preserving them in a plant press with identifying information (species name, date/location collected, name of collector.) Students mount and label pressed plants, compiling them into a class herbarium or field guide.
4. Students make posters or diagrams showing Alaskan endangered plants. They should label drawings carefully with species name and location, including suggestions for preserving those species from extinction.
5. View the 1986-87 filmstrip series by the Alaska Wildlife Week group: "Forests of Alaska." (Teachers' guide includes topics for discussion and follow-up activities.)
6. Project Wild: "Rainfall and the Forest," (Students map rainfall and vegetation type), p. 75; "Pond Succession," (make murals of stages in pond succession), p. 95; "Succession Transect," (Students use transects to describe plant communities), p. 97; "Wild Edible Plants," (Students create a local seasonal calendar of native edible plants and their uses), p. 171; "Shrinking Habitat," (Students participate in a physically-involving simulation of a land development situation)p. 173.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books:

A Guide to Wildlife Viewing in Alaska, Quinlan, Tankersley, and Arneson, Nongame Wildlife Program, Alaska Department of Fish and Game, 1983

Alaska Wild Berry Guide and Cookbook, Alaska Northwest Publishing Company, Box AA88, 130 Second Avenue South, Edmonds, WA 98020

Flora of Alaska and Neighboring Territories, Eric Hulten, Stanford University, 1974.

Handbook of Wild Edible Plants, Euell Gibbons and Gordon Tucker, Donning Company, Virginia Beach, 1980.

Root, Stem and Leaf: Wild Vegetables of Southeast Alaska, by Glen Ray, South East Regional Resource Center, 210 Ferry Way, Juneau, AK 99801. *Soon to be reprinted.*

"Threatened and Endangered Plants of Alaska," David F. Murray, U.S.D.A. Forest Service and U.S.D.I. Bureau of Land Management, 1980

Wild Edible and Poisonous Plants of Alaska, Cooperative Extension Service, University of Alaska, 1976.

Films and Videos:

"Alaskan Ecosystems," Office of Instructional Delivery and Support, Alaska Department of Education, Pouch F, Juneau, AK 99811 *A recently-completed video series concerning ecological communities throughout Alaska: $15.00 + 10% for video tapes and $4.00 for teachers guides. Also available through the state film library.*

Identifying Wild Plants

Do I need to know the major plant life in a given area and its relationship to other resources?

Adequate habitat is critical to the health and survival of wildlife. Alaska's wildlife habitats, in fact are in a large part defined by their predominant plant species. A Guide to Wildlife Viewing in Alaska lists Alaska' wildlife habitats as:

- Hemlock-Spruce forest
- Spruce-Hardwood Forest
- Tall-Shrub Thickets
- Muskeg
- Alpine Tundra
- Moist Tundra
- Wet Tundra
- Freshwater Lakes, Rivers, and Riparian Habitats
- Glaciers and Ice Fields
- Coastal Wetlands: River Deltas, Mudflats, Salt Marshes, and Sandy Beaches
- Barrier Island-Lagoon Systems
- Coastal Islands, Cliffs, and Rocky Shorelines
- Marine Waters
- Human-Altered Habitats

(A Guide to Wildlife Viewing in Alaska, p. 11)

Identifying the major plant species will help you understand the interaction of wildlife with its habitat. For example, studies in Southeast Alaska have pointed out the importance of old-growth spruce-hemlock forests for Sitka blacktail deer. Noting the shrub-sapling stage of the spruce-hardwood forest of Alaska's Interior twenty years after a fire will not only underline the interrelationship of wildlife, plant species and natural occurrences like fire, it will also help hunters and wildlife watchers find the wildlife they seek out.

What endangered plant species are found in Alaska?

Recently, world ecologists have turned their attention to endangered plants. In fact the oldest surviving living thing, the bristlecone pine of Nevada and California (up to 3,000 years old) is itself an endangered plant species, with specimens scattered in but a few places. Though Alaska is blessed with large undisturbed expanses, the state does have an endangered fern–the Aleutian shield fern–on the Aleutian Islands, cataloged in the 1930s and only lately rediscovered.

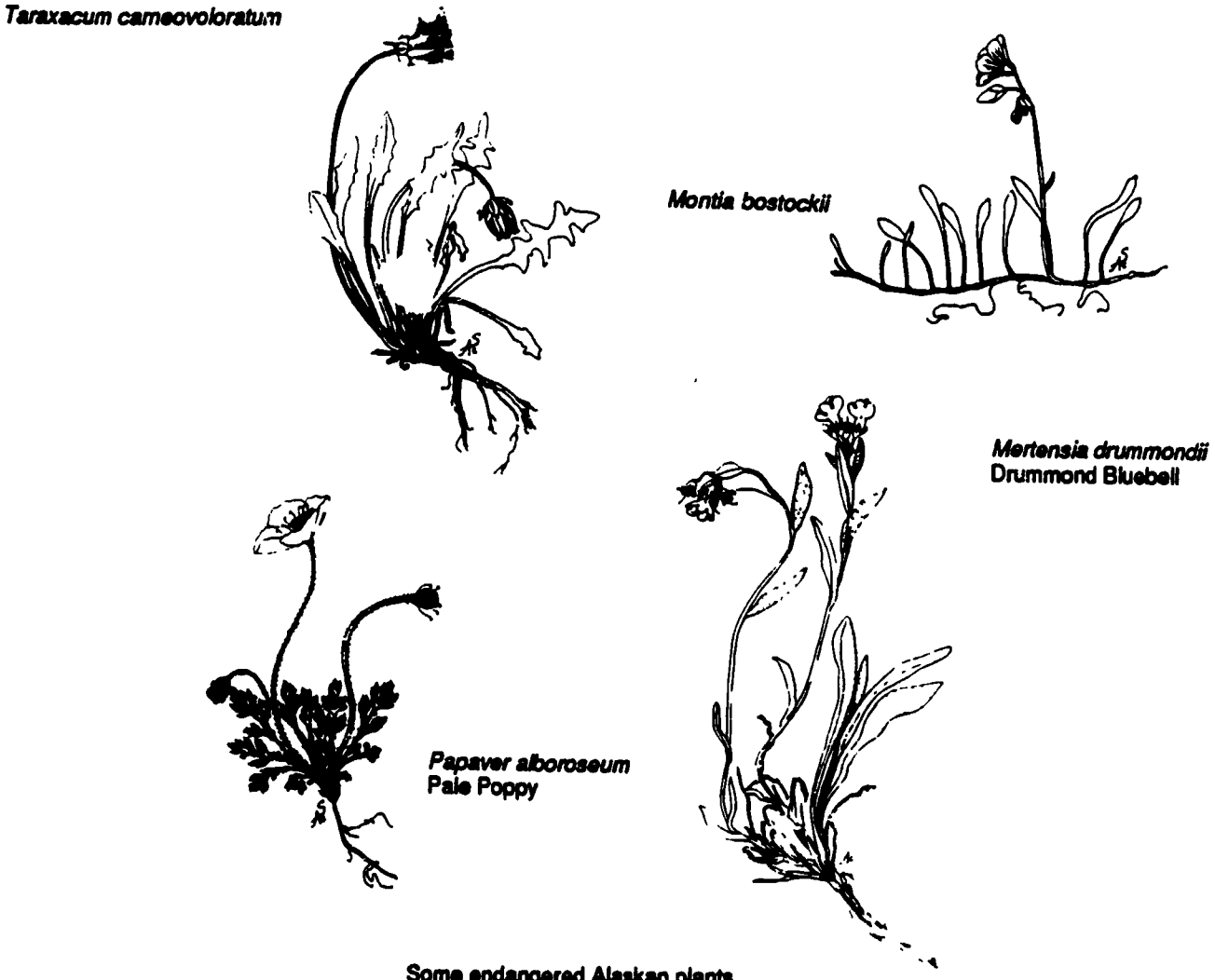
Endangered plants include:

- Aleutian wormwood *Artemisia aleutica*
- *Cryptantha shackletteana*
- Wild buckwheat *Erigonum flavum*
- Drummond bluebell *Mertensia drummondii*
- Kobuk locoweed *Osytropis kobukensis*
- Aleutian Holly-fern *Polystichum aleuticum*
- *Salix ovalifolia*
- *Smelowskia pyriformix*
- *Taraxacum carneocoloratum*
- *Smelowskia pyriformis*

Threatened species include:

- *Artemisia senjavinensis* (a wormwood)
- *Aster yukonensis* (an aster)
- *Carex jacobi-peteri*
- *Erigeron muirii* (a fleabane)
- *Montia bostockii*
- *Oxytropis kokrinensis*
- Pale poppy *Papaver alboroseum*
- Walpole poppy *Papaver walpolei*
- *Podistera yukonensis*
- *Thlaspi arcticum* (a white-flowered mustard)

David F. Murray's excellent publication "Threatened and Endangered Plants of Alaska" notes the description and location of these threatened and endangered plants.



Some endangered Alaskan plants
Courtesy of US Department of Agriculture, Department of the Interior

What are some characteristics of plant populations?

Studies by the U.S. Forest Service, BLM and state agencies, as well as universities and colleges characterize "plant populations." Plant communities are sometimes defined by use to people, value to wildlife (habitat), or by predominant species. As A Guide to Wildlife Viewing in Alaska notes:

Hemlock-Spruce forest: Dominate the landscape of Southeast Alaska and a coastal band at lower elevations in southcoastal areas. In much of this area, about 70% of the trees are western hemlock with Sitka spruce second in abundance. Other trees also occur in pure and mixed stands including western red-cedar, Alaska cedar, mountain hemlock, lodgepole pine, red alder, and black cottonwood. Hemlock-spruce forests dominate the landscape from tidewater to the alpine-subalpine zone (2,500-3,000 ft./762-914 m near Ketchikan, but 500-1,000 ft/152-305 m in Prince William Sound). Muskegs are interspersed throughout the forest. (A Guide to Wildlife Viewing in Alaska, p. 12)

Spruce-Hardwood Forest: White spruce, black spruce, tamarack, aspen, birch, balsam poplar, and willow occur in a variety of combinations on mature forest sites throughout central, western, southcoastal, and southwestern Alaska. White spruce and deciduous trees usually dominate well-drained areas and south-facing slopes, while pure stands of black spruce frequently occur on poorly drained sites and north-facing slopes. Due to wet and acidic soils on these sites, black spruce grows slowly and the trunks rarely exceed 8 in/20 cm in diameter. Lightning-caused wildfires maintain a large-scale mosaic of forest ages and types which provide habitat for a greater variety of wildlife than might otherwise occur. (A Guide to Wildlife Viewing in Alaska, p. 17)

Tall-Shrub Thickets: Tall-shrub thickets range from 3-25 ft/1-8 m high. Three main types occur in Alaska. Coastal alder thickets are found along the southern Alaska Peninsula, eastern Cook Inlet, and Kodiak Island. These are dense areas of Sitka alder, often with an understory of bent reed grass and ferns. Floodplain thickets are found in subalpine zones throughout the state. The shrub-sapling stage of burned over spruce-hardwood forests is similar to tall-shrub thickets but contains snags (standing dead trees). Birch-alder-willow thickets are composed of various species of alder and willow mixed with resin birch. These thickets vary in density and may be interspersed with lichens and other alpine plants. (A Guide to Wildlife Viewing in Alaska, pp. 21-22)

Muskeg: Muskegs cover approximately 10 million acres/4 million ha (hectares) or 3% of Alaska's land mass. Muskegs occur on former river terraces, lake basins, ponds, and old sloughs or other depressions where drainage is poor throughout central, south coastal and southeastern Alaska. In central Alaska, muskegs are usually underlain by permafrost. Muskegs consist of sphagnum mosses, sedges, lichens, and low shrubs like bog rosemary, Labrador tea, willow, cranberry and blueberry. In interior Alaska, scattered black spruce, tamarack, willow, and alder shrubs occupy drier areas in muskegs. Scattered black spruce, western hemlock, and Alaska cedar occur on drier portions in south coastal Alaska, while lodgepole pine is the dominant tree of muskegs in southeast Alaska. (A Guide to Wildlife Viewing in Alaska, p. 28)

Alpine Tundra: Alpine tundra covers approximately 85 million acres/34 million hectares, or 23% of the state. It occurs above treeline on all mountain ranges of Alaska and on lower exposed ridges in northern, western, and southwestern areas of the state. Alpine tundra areas are characterized by slow-growing, low mat plants interspersed with rocky rubble, and in mountainous areas, with cliffs. Common alpine tundra plants include herbs such as mountain avens, heather, and moss campion; low shrubs such as willow, blueberry, cranberry, and crowberry; lichens, sedges, and grasses. Dominant species vary regionally. Subalpine vegetation includes tall shrubs such as willow, alder and dwarf birch. (A Guide to Wildlife Viewing in Alaska, p. 28)

Moist Tundra: Moist tundra covers approximately 65 million acres or 17% of the state. Unlike wet tundra, moist tundra is not associated with permanent standing water. Moist tundra occurs mainly in southwestern lowland, western foothills, arctic foothills, Alaska Range foothills, and the Copper River basin. In northern areas, moist tundra occurs on well-drained river terraces and high-center polygons formed by underlying ice wedges. Sparsely vegetated sand and gravel patches, called frost boils, occur in this habitat in permafrost areas.

Moist tundra varies between locations. In some areas it consists of cottongrass-sedge tussocks interspersed with grasses, mosses and sparse low shrubs, while in other ares tussocks are scarce and grasses, sedges, polar and reed bent grass, moss, lichens, and low shrubs such as dwarf birch, willow, blueberry, cranberry, and Labrador tea. Typical plants in frost boils are moss campion, cassiope, minuartia, scurvy grass, and small sedges similar to alpine vegetation. (A Guide to Wildlife Viewing in Alaska, pp. 30-31)

Wet Tundra: Wet tundra is a permanently water-soaked, nearly treeless habitat that occurs on the northern Alaska Peninsula, Yukon and Kuskokwim River Deltas, northern Seward Peninsula, and arctic coastal plain of northern Alaska. Wet tundra consists of wet, peaty soil covered by a thick mat of lichens, grasses, sedges, low shrubs, and herbaceous plants. The most common low shrubs are willow, bog cranberry, dwarf birch, and blueberry. Typical herbaceous plants are buttercup, bog rosemary, cloudberry, potentilla, and marsh marigold. Lakes and ponds with emergent sedges and pendant-grass, and flooded, low-center polygons are common throughout this habitat. (A Guide to Wildlife Viewing in Alaska, p. 34)

Freshwater Lakes, Rivers, and Riparian Habitats: Freshwater lakes and rivers occur throughout Alaska in all terrestrial habitats. Wildlife use of lakes and rivers is affected by a variety of factors including: size of the water body, annual fluctuations in water level, ice conditions, water velocity, chemical and physical condition of the water, and the surrounding habitat. Lakes and rivers fed by glaciers or from placer mines are heavily silt-laden. Aquatic invertebrates, fish, and plants thus are often sparse, and birds and mammals that depend on these aquatic organisms for food may be uncommon. Clear-running rivers and streams often host a greater number and variety of wildlife. Lakes with healthy plant and plankton populations necessary for wildlife use often do not appear crystal clear, but the murkiness is caused by aquatic organisms rather than silt or mud.

Wildlife use of riparian (adjacent to water) vegetation is often higher than use of the same vegetation away from water. This is true because some animals feed on plants, invertebrates, or fish in lakes or rivers, but live on land. Also, vegetation along water is often more productive and stable than in more upland areas, so many terrestrial species occur at the highest densities along waterways. (A Guide to Wildlife Viewing in Alaska, p. 39)

Glaciers and Ice Fields: Glaciers and ice fields occur in mountainous regions of Alaska where the snow accumulation each winter fails to melt away before snowfall occurs the following winter. About half of Alaska was covered with glaciers during the Pleistocene, but today glaciers occur only in restricted areas and cover only 3% of the state. East of Cordova, the Bering and Malaspina Glaciers and associated ice fields form the largest ice masses in North America. Other large glaciers occur in the wet climates of the Chugach, Wrangell, St. Elias, Alaska Ranges and elsewhere.

...Though glaciers are often thought to be barren of life, a simple ecosystem including plants herbivores, and predators occurs on ice fields. Transient large animals may be observed, also Not surprisingly, few plants are able to survive the harsh cold terrain of glaciers. But, several types of algae and moss live on glaciers and ice fields and in some areas give the ice a pinkish or blue-gray cast. Moss clumps form on small sand deposits, and willow alder and spruce sometimes grow on debris-covered areas of slow-moving ice. (A Guide to Wildlife Viewing in Alaska, p. 43)

Coastal Wetlands: River Deltas, Mudflats, Salt Marshes, and Sandy Beaches: Coastal river deltas, mudflats, salt marshes, and sandy beaches are influenced by saltwater. Some areas are regularly inundated by tides, while others are influenced only by storm tides or salt spray. Most coastal wetlands are underlain by

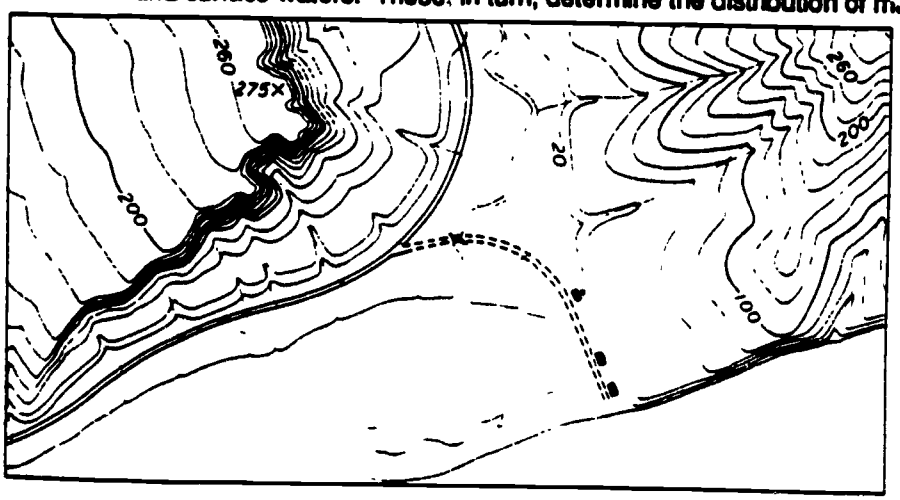
silt and/or sand. Gravel usually occurs only in restricted areas. Plants are strongly affected by geographic location and the degree of saltwater influence. On sites with little saltwater influence, woody vegetation (such as sweet gale, dwarf birch, and willow) and herbaceous plants (including bluejoint, beach rye, and spear grass) may be present. River deltas are often covered by a variety of herbaceous plants including lyngby sedge, Pacific silverweed, spike rush, seaside arrowgrass, wild pea, alkali grass, goose tongue, and others. Brackish ponds and marshes often contain sedges, mare's tail, wigeon grass, and pond weed. Frequent and erosive tidal action prevents plants from becoming established on some mudflats and sand beaches that are inundated daily, but a blue-green algae often grows over mudflats during summer. (A Guide to Wildlife Viewing in Alaska, p. 45)

Barrier Island-Lagoon Systems: Barrier island-lagoon systems occur along the northern and western coasts of Alaska from Demarcation Bay in northern Alaska to Port Safety Lagoon on the Seward Peninsula. In addition, a few systems occur along the Alaska Peninsula out to Izembek Lagoon. The long, narrow sand and gravel barrier islands are unvegetated or sparsely covered by beach ryegrass and beach sandwort. Some barrier islands also contain small patches of tundra and salt marsh vegetation. These islands are constantly influenced by ice, wind, and wave action. Along the north coast, the islands are shifting westward at an average rate of 19-82 ft/6-25 m per year. Large lagoons enclosed by the barrier islands are usually shallow, with deeper channels near passes between barrier islands. In northern and western Alaska, tidal fluctuations rarely exceed 1 ft/0.3 m. Water levels in the lagoons are strongly influenced by barometric pressure and wind, however, and may rise and fall several feet between extremes. (A Guide to Wildlife Viewing in Alaska, p. 49)

Coastal Islands, Cliffs, and Rocky Shorelines: This habitat includes small oceanic islands and sea stacks along the outer coasts of southeastern, south coastal, southwestern, and western Alaska, as well as cliffs and rocky shorelines of islands and the mainland. Habitats on larger islands are usually similar to those on the adjacent mainland. Small oceanic islands often consist of plateaus or steep slopes of thick loam soil surrounded on all sides by cliffs. Beach rye grass, reed bent grass, and various umbelliferous plants including cow parsnip and angelica are the dominant vegetation. Monkey flower, potentilla, chocolate lily, spring beauty, and other showy flowering plants may also be abundant. Trees and shrubs are absent from most islands, but Sitka spruce, salmonberry, devil's club, and muskeg cover many small islands in south coastal and southeastern Alaska.

Rocky coasts, consisting of large boulders or exposed bedrock, are often covered with kelp and a variety of marine invertebrates including sea cucumbers, sea stars, mussels, limpets, sea urchins, barnacles, and sea anemones. (A Guide to Wildlife Viewing in Alaska, p. 52)

Marine Waters: Alaska's 47,300 mi/76,122 km shoreline is longer than the coastlines of all Lower 48 states combined. The great expanses of marine waters found along this coast provide habitat to a wide variety of marine mammals and birds. The distribution and abundance of nutrients and plankton are determined by season, water depth, and ocean floor topography, current patterns, freshwater river plumes, and the degree of mixing between bottom and surface waters. These, in turn, determine the distribution of marine animals.



Three major zones are recognized including inshore, nearshore, and offshore waters. Inshore waters include the partially enclosed marine waters of bays, fjords, and sounds, while nearshore waters include open waters along the outer coasts. Offshore waters include waters over the continental shelf, or neritic waters, and waters beyond the shelf break, or oceanic waters. In Alaska, the arctic pack ice provides an additional ecological zone.

Marine plants include microscopic, free-floating phytoplankton, and larger plants that anchor to rocks to the bottom in inshore and nearshore waters. These include kelp and eelgrass. In some areas, kelp or eelgrass occur in extensive beds. (A Guide to Wildlife Viewing in Alaska, p. 57)

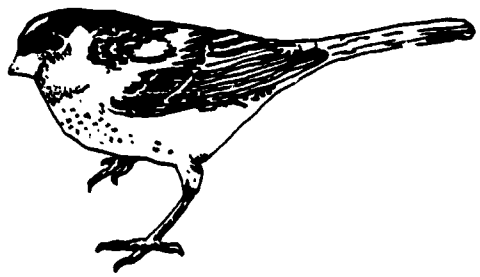
Human-Altered Habitats: A wide variety of human-altered habitats attract wildlife. Though human-altered habitats may be less aesthetically pleasing than undisturbed areas, they provide easily accessible and predictable opportunities for viewing and photographing wildlife. In some cases, relatively rare or elusive animals may be easily observed. Introduced or non-native animals also occur in some human-altered habitats.

Some wildlife use buildings, bridges, towers, telephone or power lines, gravel pits, cooling ponds, cannery or sewage outfalls, garbage dumps, roadsides, airports, and agricultural fields. These human-altered habitats either simulate a natural habitat or provide a source of food, cover, or other commodity that is scarce or absent from surrounding areas. Zoos and fish hatcheries also provide wildlife-viewing opportunities." (A Guide to Wildlife Viewing in Alaska, p. 61)

Is there anything I can do to improve plant conditions?

Alaska is blessed with large untrammeled spaces. In many places around the world the endemic (Native or original) plant species have been grossly disturbed. For example, few places in the American Great Plains exist where endemic prairie plants and flowers grow as they once did. Ecologists lament the destruction of the great rain forests of Central America and the Amazon basin. Obviously one can support limiting that destruction elsewhere. In Alaska, we can be careful with fire; we can properly dispose of wastes and refuse (particularly waste oil); we can use endemic species for landscaping (more and more endemic flowers and shrubs are available at nurseries); we can wisely (and cautiously) use chemicals, pesticides and herbicides; we can properly plan areas for logging and reforest them after use so that important wildlife habitat is not eliminated; we can reclaim areas strip-mined for coal, gravel, and other materials; we can properly dispose of mining tailings; and we can wisely develop (and protect!) wetlands.

Those involved in identifying, evaluating, categorizing and cataloging plants, soils, streams and rivers and air throughout the state often concern themselves with plant conditions.



Golden-Crowned Sparrow

Winter Wren

Understand the Importance of the Resource

Animal Characteristics and Management Factors
Teacher Page

Competency: **Identify animal characteristics and management factors**

Tasks: Explain:

a. carrying capacities
b. animal territoriality
c. the idea of harvestable surplus
d. the issue of predator control
e. an area's biotic potential
f. the relationship of sex ratios to wildlife populations
g. the relationship of hierarchy of predation on wildlife populations
h. seasonal variations in wildlife populations
i. wildlife range

Introduction

The job of assessing wildlife populations and determining management factors is done by the professional wildlife biologist. Though "land managers," may either train as a planner with an interest in wildlife, or as a wildlife biologist with an interest in planning they are not wildlife managers in an active sense. In some cases land managers deal with wildlife management issues.

Overview

The University of Alaska Fairbanks offers programs in resource management. Additionally, the wildlife biologist is concerned with land management issues. Fish and wildlife technicians under the direction of a wildlife biologist would collect the information substantiating these management reports. The "Alaska Career Guide" lists over 1,300 jobs related to collecting and processing this information. Some Native corporations collect their own data or contract with private concerns to obtain data.

Suggested Learning Activities

1. Project Wild: "Muskox Maneuvers," (Students play a very active simulation game illustrating predator-prey relationships)p. 99; "Oh, Deer!" (Students play a simulation game illustrating the interaction of habitat and populations)p. 107; "How Many Bears Can Live in this Forest?" (Students play an active simulation game involving limiting factors for animal populations), p. 101; "Deer Crossing," (Students participate in problem-solving: animal populations/human development)p. 184; "Carrying Capacity," p 221 (Students play an active simulation game: population management)p. 121; "Checks and Balances, (Students participate in problem-solving regarding population management), p. 223.
2. Carrying capacity: Students illustrate, by playing musical chairs (each chair represents available food and shelter for one ungulate.) Adjust number of chairs to represent food and shelter available from one season to the next.
3. Animal territoriality: Discuss a familiar situation: dogs in the local neighborhood: how do they interact with other dogs on their own turf, on public turf, on the property of other dogs.
4. Invite a panel of environmentalists and wildlife managers to class to debate the concepts of "harvestable surplus" and predator control (for wolves, for example).
5. Students research the reproductive habitats and patterns of oysters, rabbits, and bears. Calculate biotic potential for one pair of each species over a period of five years. Graph/compare results for the three species. (A similar activity is found in Alaska Wildlife Notebook Series and Alaska Wildlife Notebook Series Activities Guide for Teachers: p. 47.

6. Students discuss and review wildlife management and ecology books, locating examples of the results of disturbance on the hierarchy of predation.
7. Students talk with or write to game biologists about the relationship between moose and wolf populations in Alaska, in order to write an opinion paper presenting their views on this management problem.
8. Alaska Wildlife Notebook Series and Alaska Wildlife Notebook Series Activities Guide for Teachers: "Bison ranking order game:" (Students evaluate priorities: protection of barley fields versus maintaining wild bison groups.)p. 1; "Value of brown bear" (Students compile data to determine value of bears), p. 5; "Caribou community interaction game;" p.7; "Herbivore-plant interaction game" (Students learn relative values of different species of plants to moose), p. 13; "Wolves: values clarification game, " p. 23; "Wolverine: Predator control simulation game", p. 25; "Foxes and Lemmings:" (Students view film, "Seattle Fur Exchange," from the Alaska Film Library #30166. Students compute biomass ratios for both species.), p. 27; "Muskrat: Supply and demand," (simulation game: furbearer economics)p. 47; "Lemmings: food chain diagram," p. 49.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802. *"Project Wild" available through Project Wild Coordinator. This excellent program is full of wildlife-related activities.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books:

Alaska Habitat Management Guide, Life Histories and Habitat Requirements of Fish and Wildlife, Alaska Department of Fish and Game, Juneau, Alaska 1986. *An involved species-by-species guide. A must for the wildlife teacher.*

Basic Hunter's Guide, National Rifle Association Sales Department, P.O. Box 96031, Washington, DC 20090-6031. *An excellent authoritative beginning guide to firearms and hunting. $8.95 for single copies, less for quantity. Quotations used by permission National Rifle Association.*

The Philosophy and Practice of Wildlife Management, Frederick F. Gilbert and Donald G. Dodds, Krieger Publishing, Malabar, Florida, 1987 *An involved college text concerning wildlife management.*

"Project Learning Tree," Available through Cooperative Extension Service, University of Alaska, Fairbanks, AK 99775. *A useful environmental education/natural science program for all age levels.*

Animal Characteristics and Management Factors

What are carrying capacities?

A carrying capacity determines how many animals a given area can support over time. Carrying capacities depend on a number of factors, including the availability of food and water, and protection from the weather. Carrying capacity is a long-term concept, an average over many seasons or other conditions.

The number of ungulates [hoofed animals] living on a lush summer meadow will be sharply reduced when winter snows flatten cover and lessen the availability of food and shelter. Successional changes over longer periods of time will cause habitat change and alter that habitat's carrying capacity. ...Over time, nature will maintain a wildlife population balance at or near carrying capacity." (Basic Hunter's Guide, pp. 22-23)

What is animal territoriality?

Animal territoriality involves where an animal lives and roams. Social interactions between animals can affect the carrying capacity of a given area. For example, bears may tolerate only so many bears within their territory. If too many animals inhabit a given area, some of the animals might leave or, if they stay, gland and hormone changes can lower their reproduction or show psychological stress. Territoriality spaces animals within a given environment. (The Philosophy and Practice of Wildlife Management, p. 66)

What is harvestable surplus?

Harvestable surplus is the number of animals that can be harvested from a particular area without adversely affecting the population. There are varying opinions on harvestable surplus. For example, the NRA states, "surplus wildlife cannot be stockpiled and saved for future use. A surplus is either used or lost.

"The average life span of most wildlife species is less than three years. All forms of wildlife are living creatures that will inevitably die and be removed from the population. This loss is replaced by the birth and addition of new individuals to the population.

"Man's ability to control and manipulate both the rate of depletion and the factors that influence the rate of production of a wildlife population forms the basis for wildlife management." (Basic Hunter's Guide, p. 26)

Others feel that the idea of "harvestable surplus" is fallacy. For example, Gilbert and Dodds in The Philosophy and Practice of Wildlife Management state that "modern research is beginning to repudiate a philosophy which has pervaded wildlife management for many years. ...Certainly, populations generally produce a surplus annually, but this may be small or even locally nonexistent under natural conditions." (The Philosophy and Practice of Wildlife Management, p. 73)

Should predators in Alaska be controlled?

In the past wolves have been controlled throughout the western world. In fact, in more recent times state biologists have controlled wolves using various means. Historically, Alaska had a bounty on wolves. A good deal of study has gone into the issue of predator control. Studies have theorized that predators primarily take the old and sick of certain species, but more recent studies have shown that to be an oversimplification. Whatever the case, it is true that controlling predators can, at least in the short run, certainly boost the populations of the prey they take. The state of Alaska has proposed controlling wolves to boost moose populations in certain areas. This proposed program has generated a great deal of controversy because such control may have long-term impacts on both predator and prey.

What is biotic potential ?

As Otto and Towle state in Modern Biology, "think of the possible number of offspring from a female oyster that might shed 114 eggs at a single spawning! The **biotic potential** of a species is the number of offspring that could theoretically exist if all offspring survived and produced young." (Modern Biology, p. 750)

What is the relationship of sex ratios to wildlife populations ?

As Riney notes in Study and Management of Large Mammals, "In classifying a population the attempt is made to determine the proportions of different recognizable sex and age groups"." As the author later notes, "the significance of the sex ratio varies with the mating habits of the species of animals involved. In a monogamous species (species which mate one on one), an equal sex ration will favor maximum production of young. In polygamous or promiscuous species (those which mate with females in a group or with whatever female available), an equal sex ratio will in many cases not result in higher production of young [and may actually retard it]. In other words, counting the male to female ratio in given populations can point out the relative health of the population and whether or not that population is and will be expanding or not.

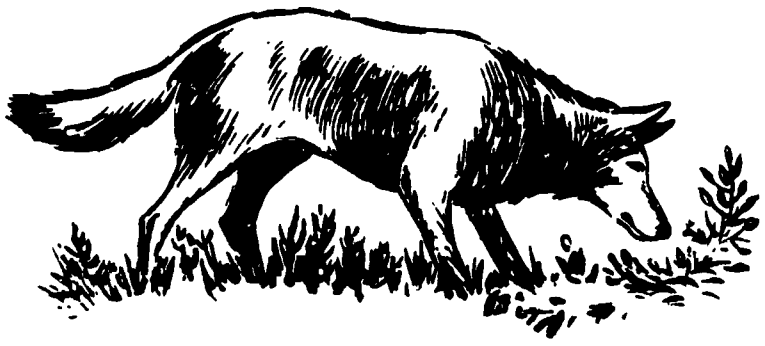
Riney notes that sex ratios can be obtained either by observing live animals in the field or by examination of kills. (Study and Management of Large Mammals, p. 156)

How does hierarchy of predation relate to wildlife populations?

Predation is defined as "the capturing of prey as a means of maintaining life." The definition is an interesting one because of the words "capturing," "maintaining" and "life." "Capturing" means to catch, "maintaining" to keep, and "life" is an essence that all living creatures of course have. Predation is a fact of life.

Much has been made of humankind as a predator and the "hierarchy" of predation or food chain or food pyramid. Animals feed on other animals and are in turn fed upon, in a sort of pyramid shape. When those on the pyramid die, their bodies decompose and are in turn fed upon by those lower on the food chain. Simple wildlife management tells us that when one or some of the links of that chain are removed, disarray can occur. For example, the wolves in the Southwestern United States were completely eliminated by the turn of the century. The cougars were also controlled, and deer in certain areas, such as the Kaibab plateau near the Grand Canyon overpopulated the areas, stripped the vegetation, and died of starvation in massive numbers. Pat wildlife theory states that when the hierarchy of predation is undisturbed, a relative balance between predator and prey will occur. More recent studies have shown more complex answers than that.

Factors such as fire, habitat, hunting, weather, snow cover, and cyclical patterns seem to affect wildlife populations–not just the presence or absence of predators. Such research is behind some recent discussion of possible predator (wolf) control in certain areas of Alaska to boost moose populations for sports and subsistence hunters. Whatever eventuates, a truth is that natural systems are complex. Predation is one important factor in that complexity.



Are there seasonal variations in wildlife populations?

As the NRA notes, "In addition to the shifts and changes that occur from year to year, populations demonstrate an even greater seasonal fluctuation in numbers.

"The most obvious change in population level occurs in the spring when the young of most wildlife species are born. The extent of this immediate increase in population level will depend on the number of breeding females as well as the number of young each female produces. Cow moose and elk may bear one or possibly two calves, while a hen mallard may hatch 12 to 14 new additions to the populations of that species. Not all young will survive, but understandably, populations reach their peak levels in the spring. At this time of the year habitat is at its best, offering lush new vegetation for the herbivores or plant-eating forms of wildlife and large prey populations for the predators.

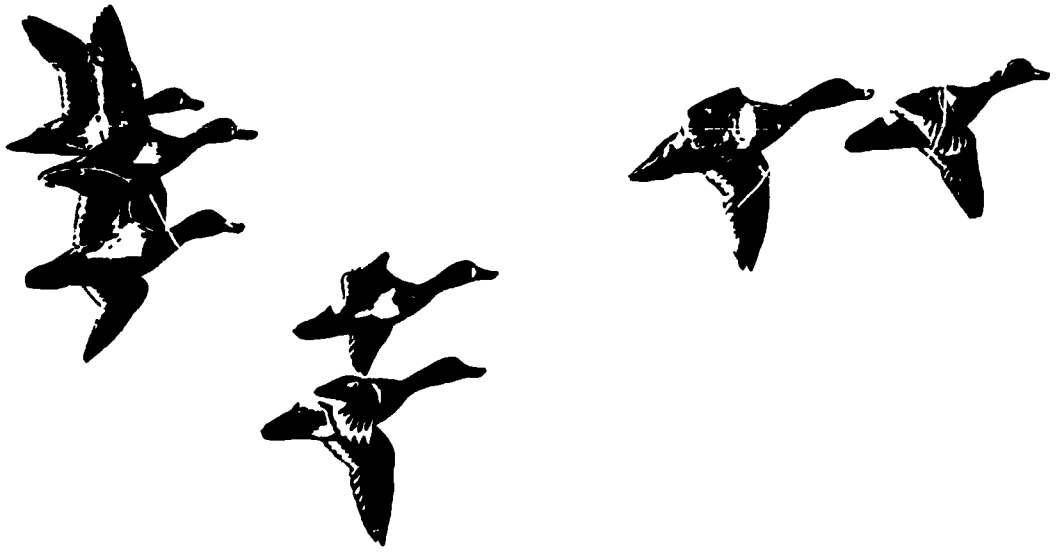
"Though many animals will die over the spring, summer and fall, the winter period is the period of heaviest mortality.

"In winter, the ability of habitat to support a large number of animals is reduced, often drastically. Those animals in excess of the number that the habitat can then support become surplus and may be lost to starvation and

other factors. This annual mortality is part of the natural cycle. All that is required in nature is that a sufficient number of animals –the breeding stock–survive until the spring and the cycle starts over." (Basic Hunter's Guide, p. 23)

How is wildlife range defined?

Range is the geographic region in which an animal or plant normally lives or grows. It is defined by what wildlife *uses*, that is where wildlife finds the conditions needed for life. Many wildlife agencies base hunting quotas or other management measures upon analysis of range conditions, hunting kills and population trends.



Wildlife Management
Teacher Page

Competency: **Understand wildlife management**

Tasks:
Identify types of values of wildlife resources
Describe history of Alaska wildlife management
Identify the duties of the wildlife manager and wildlife biologist
Identify basic needs of wildlife
Describe how to manage wildlife by intensive and extensive methods
Protect vanishing species
Explain problems and prospects of introducing exotic species
Use field investigation techniques
Identify laws pertaining to wildlife in Alaska

Introduction

"Planner" and "Manager" might be thought of as buzz words of the 70's and 80's in Alaska. With great changes in allocation of resources, changes in land status and great growth, especially in urban areas, hundreds of jobs were created to plan this development. On one side, the government created its plans and reports. On the other side, Native, environmental, private and sports' groups made their plans. Issues concerning wildlife management are often the subject of news reports in the state.

Overview

The job of wildlife manager falls into several categories. A wildlife manager for a National Wildlife Refuge might be a biologist, with training as a scientist. The person might be a law enforcement specialist. The person might have a background in recreation with interest and experience in the other areas. Wildlife brings a number of disciplines together. The job of wildlife manager might fall in the realm of the professional planner, who develops programs for land and resources being managed.

Suggested Learning Activities

1. Invite a wildlife manager or biologist to class to discuss job duties, previous training, introduce concepts of intensive and extensive management and to give examples.
2. Students review the laws and regulations for game and non-game wildlife in Alaska.
3. Project Wild: "Pro and Con: Consumptive and Non-Consumptive Uses of Wildlife," p. 33 (Students research and debate the values of wildlife); "History of Wildlife Management," p. 155 (Students investigate responsibilities of different management agencies by developing questions and writing letters); "Planting Animals," p. 19 (reintroduction of endangered species to suitable habitat); "Who Lives Here?" p. 17 (Students research effects of exotic species on endemic species). NOTE: You will find many other relevant activities in this source.
4. Students study the marine mammal protection act and discuss possible problems involved for various groups of people. You may want to invite protection agents from National Marine Fisheries Service, Eskimo whalers, fishermen, etc. and ask them to discuss this question as a panel.
5. Alaska Wildlife Notebook Series and Alaska Wildlife Notebook Series Activities Guide for Teachers: p. 65: Students play this marine mammal act simulation game; p. 71: Students discuss the future of the Alaska walrus herds; p. 89: Students role play a public hearing on migratory waterfowl treaties.

Resources

Alaska Department of Fish and Game, Box 3-2000, Juneau, AK 99802

National Marine Fisheries Service, Box 1688, Juneau, AK 99802. (907) 586-7221. *Manages marine mammals and fisheries outside between two miles and two hundred miles offshore.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

U.S. Fish and Wildlife Service, Alaska Region, 1101 East Tudor Road, Anchorage, AK 99503

Books:

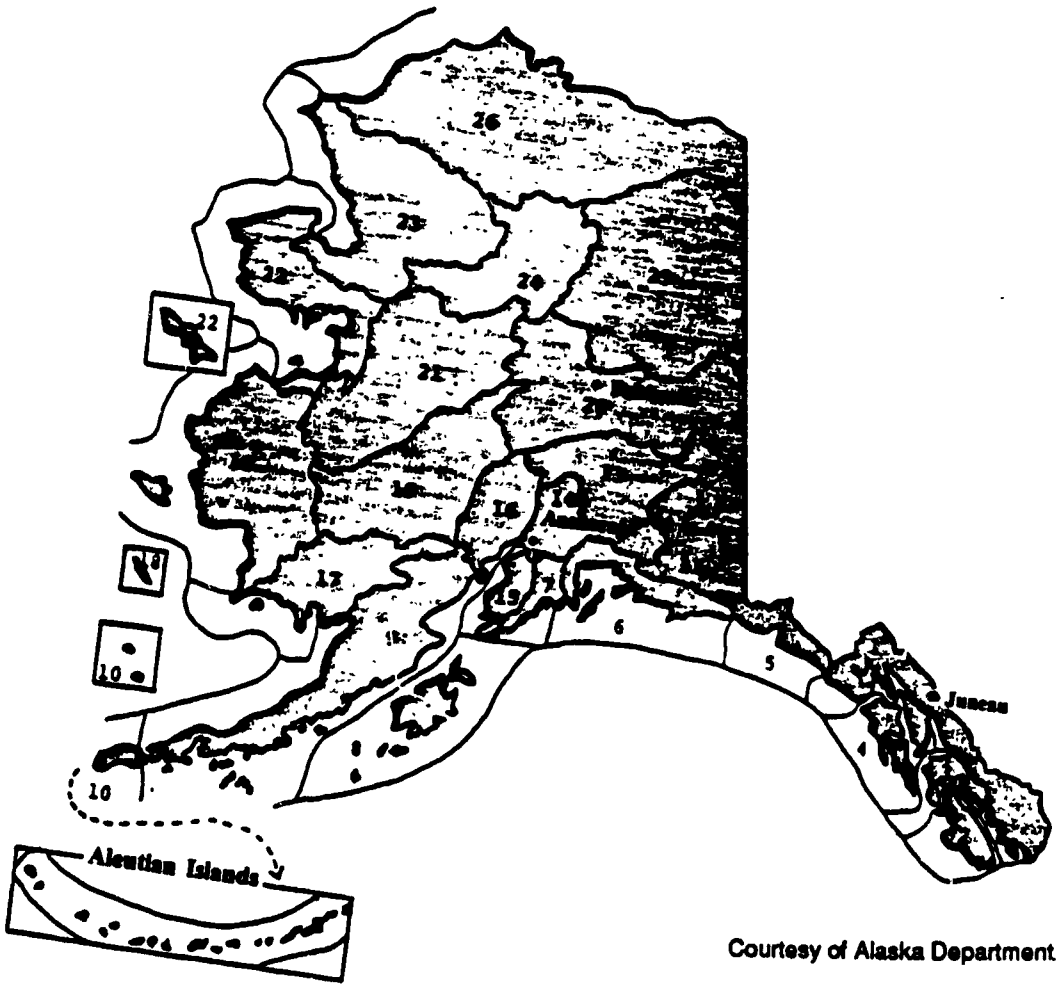
"Threatened and Endangered Plants of Alaska," David F. Murray, USDA Forest Service and USDI BLM, April 1980.

Promises to Keep, Robert Weeden, Houghton Mifflin, Boston, 1978. *A non-fiction novel on resource management in Alaska.*

Wildlife Management

What are some types of values of wildlife resources?

Wildlife resources often have values which are not directly financially beneficial. For example, people feel a kinship with wildlife–they get excited when they see a bear or an eagle. These values are aesthetic values. These aesthetic values can also be converted into monetary values. For example, hundreds of thousands of visitors flock to Denali National Park each summer, many solely to view the wildlife. This interest can translate into economic benefit for Alaskans.



Courtesy of Alaska Department of Fish and Game

Game Management Units

Other values include value of food. Thousands of Alaskans hunt, fish and gather food from Alaska's wildlife resource. Many are subsistence users, others are recreational users. Obviously these people gain by the use of wildlife.

Many Alaskans use the wildlife resource commercially. Big game guides, outfitters and those who lead photo expeditions make a living through the presence (and potential presence) of wildlife.

Another value of wildlife might be thought of as a gene pool. Few places in the world remain where wildlife roam undisturbed. Natural diversity occurs in Alaska's open spaces. Some think of this natural diversity like a bank–a hedge for the future. Sometimes there are bank withdrawals. For example, recent programs to re-introduce eagles to New York and Massachusetts have taken eagles from Alaska's abundant bald eagle populations.

To Native and others, wildlife has spiritual values. Some feel a kinship with wild creatures which transcends personal and economic gain. All Alaskans have a stake in Alaska's wildlife.

What is the history of Alaska wildlife management?

Some feel that Alaska has some shameful stories in terms of wildlife management. Others feel that the state is the "last frontier"–the last truly wild place in the United States. The truth is that some of the thoughtless destruction which was in many cases the watchword of the Lower 48 (note the slaughter of the buffalo) also took place in Alaska. For example, the passive muskox, renowned for its fur, was completely eliminated from the state by 1865, when the last herd of 13 was slaughtered. Since that time muskoxen have been introduced to the state from Greenland, and now at least five herds–over 1,600 animals inhabit the state. Sea otters, whose lush fur lured the Russians up and down the Alaskan coast, were almost completely wiped out by the early 1800's. The Russians later limited hunting, but after the Alaska purchase, the U.S. allowed unlimited hunting. The sea otter was nearly extinct until protection measures in 1911 and later transplants built populations. Today some 125,000 of these animals are found along the Alaskan coast. Other stories, such as the decimation (and recovery) of the Northern Fur seal point out that indeed, Alaska in certain ways had followed the poor examples of the Lower 48.

Alaska's terrain, climate, and remoteness has assured protection for many wildlife populations until recent times. Low human populations, sparse roads, and limited habitat disturbance (not to mention some modern management practices) have kept many wildlife populations close to historic levels. Today, wildlife in Alaska is managed by several different of agencies.

What are the duties of the wildlife manager and wildlife biologist?

A wildlife manager generally has a background in natural sciences with an interest in government and land issues. A wildlife biologist per se has at least a four-year college degree (B.S.) in wildlife biology, with competition necessitating an M.S. or PhD in most cases. The manager reviews reports from wildlife biologists, land management agencies, law enforcement officers; prepares plans and reports, and supervises officers and other employees. According to the U.S. Fish and Wildlife Service, "Refuge managers manage national wildlife refuges to protect and preserve migratory and native species of birds, mammals, endangered species, and other forms of wildlife. They are responsible for providing a balanced wildlife management program at the refuge as well as public use programs."

The agency states, "wildlife biologists study the distribution, abundance, habits, life histories, ecology, mortality factors, and economic values of birds, mammals, and other wildlife. They plan or carry out wildlife management

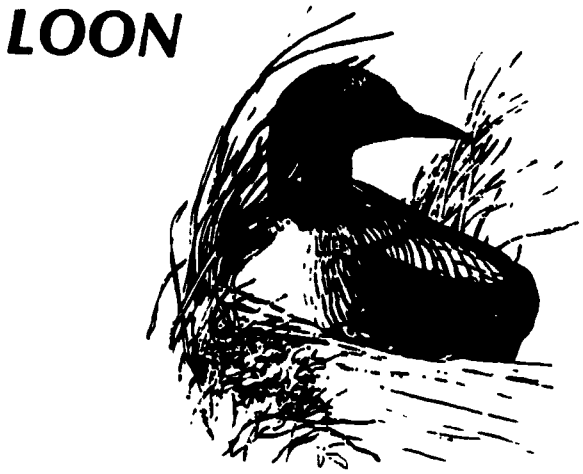
programs, determine conditions and problems affecting wildlife, apply research findings to the management of wildlife, restore or develop wildlife habitats, regulate wildlife populations, and control wildlife diseases."

What are the basic needs of wildlife?

The basic needs or habitat of wildlife are the main concern of the wildlife biologist or manager. Like any other living creature, wildlife requires food, cover, water, space, freedom from disturbance, and suitable climate.

How do we manage wildlife by intensive and extensive methods?

In areas such as those just around Anchorage, there is great hunting demand and pressure on the moose population. A number of people would like to put a moose in the freezer. Such a herd of moose, with such pressures on its population and such demand for maximum harvest, is managed *intensively*. A considerable amount of money, hours, and effort is put into managing that herd, disproportionate to the wildlife efforts elsewhere. These management efforts are put forth to optimize harvest.



Courtesy of Alaska Department of Fish and Game,
Wildlife Notebook Series

In other areas of the state harvests are based on estimates of populations. These may be areas with low hunting pressure–such as the deer or black bear populations on remote islands in Southeast Alaska. Intensive data and effort is not needed because the hunting pressure on the resource is not there. The management is designed with the understanding that pressures on that population are light. This *extensive* management style requires fewer workers and is much less expensive to maintain. It is not designed to optimize harvest, so it is a conservative style of management.

A third method of management might be termed passive management. In a park or wilderness area where the only forms of management may be to minimize the human impact, such management may be termed passive management, though forbidding or limiting hunting can be though of as pretty intensive management.

Do we need to protect vanishing species?

Alaska is lucky in that almost all of the *endemic* (native) species are still present. Protecting vanishing species is very controversial. For example, the snail darter, a small fish found only in a certain stream in Tennessee held up a massive dam project, solely to protect that species. The Aleutian Canada goose precluded the re-initiation of fox farms to the Aleutian Islands, where they originally were found. Some people scoff at protecting

"obscure" species at the expense of such projects. They consider extinction to be a fact of life, a natural course of events. Others say that anytime we reduce the "genetic pool" on the earth–the diversity of plants and animals–we are snuffing out a history that took millions of years to evolve. The answer lies in human discussion, in government policy, in personal actions, and in identification of priorities for the human community and the biosphere on which we depend.

Endangered animal species in Alaska include:

- American peregrine falcon
- Aleutian Canada goose
- Eskimo curlew
- short-tailed albatross
- humpback whale
- finback whale
- gray whale

Threatened species include:

- Arctic peregrine falcon

What are some problems and prospects in introducing exotic species?

Exotic species are animals from another land or area which, when introduced, take residence in the new territory. Alaska has exotic wildlife. Reindeer, introduced forty or fifty years ago are now permanent Alaskan residents, though they are domesticated livestock. Similarly, bison, once endemic to Alaska, have been brought to the Delta area and these exotic animals are multiplying there. Elk have been introduced to islands in Southeast and near Kodiak. What are the repercussions of introducing these exotics? They may not be grave in Alaska, since the animals purposefully introduced haven't seriously interfered with native species. Most were either once historically present have been purposefully located where impacts on natural systems will be minimal. The consequences of accidental introductions, such as escaped pets such as ferrets remain to be seen.

Elsewhere, in other climates, introducing exotic species has spelled disaster. Florida, for example, has suffered greatly from the introduction of the walking catfish, a species of fish which is able to waddle from pond to pond. This virtually inedible poisonous catfish has spoiled lake after lake in the state, and is virtually impossible to eradicate, as the fish can move out when attempts are made to kill it. Australia, a continent which historically had no predators, has been greatly impacted by the introduction of rabbits. Millions of rabbits have overrun parts of the continent, so that to battle the rabbits, authorities have introduced rabbit diseases to reduce their numbers. Exotics are often dangerous to an ecosystem.

Alaska state regulations prohibit the introduction or importation of exotic species into the state without a permit from ADF & G and the Board of Game.

What are some field investigation techniques?

Field investigation is simply a way to collect information in the field. Information can be collected in a number of forms for a number of purposes. Generally field data are involved in some sort of study, though careful field notes which are collected solely for the sake of observation can prove valuable at a later date. Park rangers on patrol, for example, may note the species of wildlife they observe in the course of their duties. Logged observations, over time, can prove useful to later reports. Generally, field investigation involves planning an investigation and gathering data.

Some of the techniques for gathering data might involve noting color patterns in wildlife; dying, marking or tagging wildlife for identification; capturing and marking wildlife, or radio telemetry. Field investigation might involve species checklists, population surveys, counts and estimates, sample counts, kill data, animal counts, track counts, defecation counts, call and drumming counts, identification of tracks or defecation, call and drumming counts. Other field investigations involve habitation, including a checklist of vegetation types, subjective or objective descriptions, habitat classifications, mapping, aerial photography, transects, measurement of water or shelter. Other data collected include food and feeding behavior, principal and preferred foods, stomach analysis, dropping analysis, mouth contents, and more. Field investigation techniques follow the purview of studies involved.

How about laws pertaining to wildlife in Alaska?

Both game and non-game have protection in Alaska. Protection falls under various jurisdictions; for example, marine mammals are under the protection of the federal government, and game species, the state. See "Alaska Game Regulations" from ADF & G.

Understand Competing Uses

Wildlife Management Issues

Teacher Page

Competency: **Understand issues related to wildlife management**

Tasks: Explain:

a. ways to maintain and improve wildlife habitat
b. major difficulties in wildlife management
c. the management of preserves and refuges
d. management practices for moose, deer, wolves, bear, and caribou
e. the system of Advisory Committees, Boards of Fisheries and Game

Introduction

Wildlife management issues are often at the forefront in Alaska. From the management of Alaska's fisheries to issues like aerial wolf control and subsistence use , wildlife management involves controversy.

Overview

Those specifically dealing with wildlife issues include biologists and resource managers, recreation directors and supervisors, park rangers, and urban and regional planners. When biologists, resource managers, park rangers and others deal specifically with wildlife issues, they are doing the work of the planner. The "Alaska Career Guide" says that planners "study how land currently in use could be improved, and propose ways to develop unused land and ensure that it meets future needs. ...Employers state the most desirable master's degree is in planning, but degrees in public administration and business are also good. A bachelor's degree in city planning, land resource management, architecture, or engineering may qualify for some entry positions. A background in fisheries or oil industry economics is advantageous." Suggested courses include advanced math, chemistry, oral and written communication, sociology, history, geography and drafting. Salaries can be high: $2,900 to $5,000 with 250 employed statewide.

Suggested Learning Activities

1. Invite a wildlife manager or biologist to class to discuss job responsibilities, previous training, and introduce concepts of intensive/extensive management and to give examples.
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Resources

Board of Fisheries, Board of Game, Alaska Department of Fish and Game, P.O. Box 2-3000, Juneau, AK 99811. *Contact this board for the schedule of meetings in your area. Meetings (and general topics) are established a year in advance.*

Alaska State Parks, Department of Natural Resources, Division of Parks and Outdoor Recreation, 3601 'C' Street, P.O. Box 107001, Anchorage, AK 99510-7001

Alaska Center for the Environment, (ACE), 700 H St. #4, Anchorage, AK 99501. *Ardent environmental group with an interest in wildlife issues.*

Alaska Wildlife Alliance, P.O. Box 190953, Anchorage, AK 99519 (907) 277-0897. *Environmental group.*

Bureau of Land Management, 701 C Street, Box 13, Anchorage, AK 99513. *Works with Alaska Department of Fish and Game on wildlife issues on public land.*

National Marine Fisheries Service, Box 1688, Juneau, AK 99802. (907) 586-7221. *Manages marine mammals and fisheries outside between two miles and two hundred miles offshore.*

National Park Service, Alaska Region, 2525 Gambell St., Anchorage, AK 99503

Rural Alaskan Community Action Program, Box 200908, Anchorage, AK 99520 (907) 279-2511. *Has an active subsistence division. Sponsors Rural Alaska Resources Association (RARA) newsletter.*

Student Conservation Association, P.O. Box 550, Charlestown, NH 03603 (603) 826-5206. *This agency manages volunteers in national parks, forests, refuges, on BLM lands, in state park and wildlife agencies, and private natural resource agencies.*

U.S. Forest Service, Chugach National Forest, 201 East Ninth Avenue, Suite 206, Anchorage, AK 99501

U.S. Forest Service, Tongass National Forest, P.O. Box 21628, Juneau, AK 99802-1628

Books:

THE ALASKA ALMANAC, FACTS ABOUT ALASKA , Alaska Northwest Publishing Company, 137 East Seventh Ave., Anchorage, AK 99501, 1988

Study and Management of Large Mammals, Thane Riney, John Wiley & Sons, publishers, New York, 1982. *An involved but readable college text concerning wildlife management.*

Wildlife Management Issues

What are some ways I can maintain and improve wildlife habitat?

You can do your part to maintain and improve wildlife habitat in a small way–you can place your wastes in the proper receptacles, especially plastic marine litter. Take part in litter cleanup campaigns. You can take a stand on resource management and inform yourself fully on political decisions concerning wildlife habitat. You can inform your political representatives of your views. You can practice low impact camping and use of wildlife habitat, especially in regards to machinery and vehicles. You can obey state and federal laws in regard to forests, wetlands, and waters. You can be careful with fire, especially during times of fire danger. You can volunteer at state or federal wildlife refuges. Another way to improve habitat is to use products that have the least detrimental effects on wildlife and the ecosystem. Such products might include using paper products instead of plastic or using biodegradable soaps and detergents.

What are some of the difficulties encountered in wildlife management?

Wildlife is an emotional and highly political issue, especially in Alaska. For many Alaskans, wildlife relates not only in an abstract way, as it does in many other states, but also to their lifestyles, and livelihoods. Laws or management decisions regarding wildlife in this state might determine whether someone makes a living or eats in the manner in which they are accustomed. Other difficulties include support from communities, governments, and users.

What are some special issues in the management of Alaskan preserves and refuges?

Subsistence is a recurring issue, as anyone who lives in a rural area can testify. Old-timers in Alaska can testify that in some areas hunting has dropped off. The state's population, though small, has grown, over the past 20 years at a rapid rate. Human pressures are real, even in Alaska. Issues concerning the management of Alaskan preserves and refuges are debated every day in Alaska. One important issue is wilderness. The Alaska National Interest Lands Conservation Act of December 2, 1980 added millions of acres to the National

Wilderness Preservation System. As the Alaska Almanac states: "Administration of these wilderness areas is the responsibility of the agency under whose jurisdiction the land is situated. Agencies that administer wilderness areas in Alaska include the National Park Service, Fish and Wildlife Service and the USDA Forest Service. Although the Bureau of Land Management has authority to manage wilderness in the public domain, no BLM wilderness areas exist in Alaska."

What are some special considerations in the management of moose, deer, wolves, bear, and caribou?

Special management practices for moose involve some controlled burning in some areas, crushing vegetation, limiting the hunting season, limiting the harvest (in many areas the limit is one moose per person, antlerless moose only during a limited period), and other regulations such as limiting the means of harvest, i.e. no same-day airborne hunting, and requiring all hunters to be licensed. Control of predators (wolves) has been proposed in certain areas to boost moose populations.

Special management practices for deer include protecting old-growth forest so that deer have adequate habitat, limiting hunting seasons to late summer and fall, limiting the harvest, and limiting the harvest to bucks only during certain seasons.

Management practice for wolves involves limiting the hunting and trapping seasons (in some areas there is no closed season), limiting the means by which the animals may be taken, and limiting the number of wolves which may be taken.

Management practices for bears include many of the above as well as requirements that towns and villages properly dispose of their refuse by incineration, burning and burying in a landfill, and/or fencing the dump. Keeping bears away from garbage is an expensive and involved effort.

Special management practices concerning caribou include hunting rules and regulations and protection of habitat. Other management practices include such widely different practices as constructing underpasses and overpasses on the pipeline or re-establishing caribou in areas in which they were once prevalent.

Regulations for all of the above animals are included in Alaska Department of Fish and Game publications.

What is the role of Advisory Committees, Board of Fisheries and Board of Game?

There are 86 Fish and Game Advisory Committees established around the state. Members of these Advisory Committees are nominated by communities, then cleared and accepted by the Division of Fish and Wildlife Protection and Boards of Fisheries and Game. The committees review all proposed changes in fish and game regulations. They make recommendations. Citizens may testify before these committees. Their recommendations go to the Boards of Fisheries and Game which establish regulations which are in turn enforced by local, state, and sometimes federal law enforcement officers. Individuals also may testify or submit recommendations directly to the Boards of Fisheries and Game for consideration. Citizen input is crucial in the decision-making process. Your input is needed!