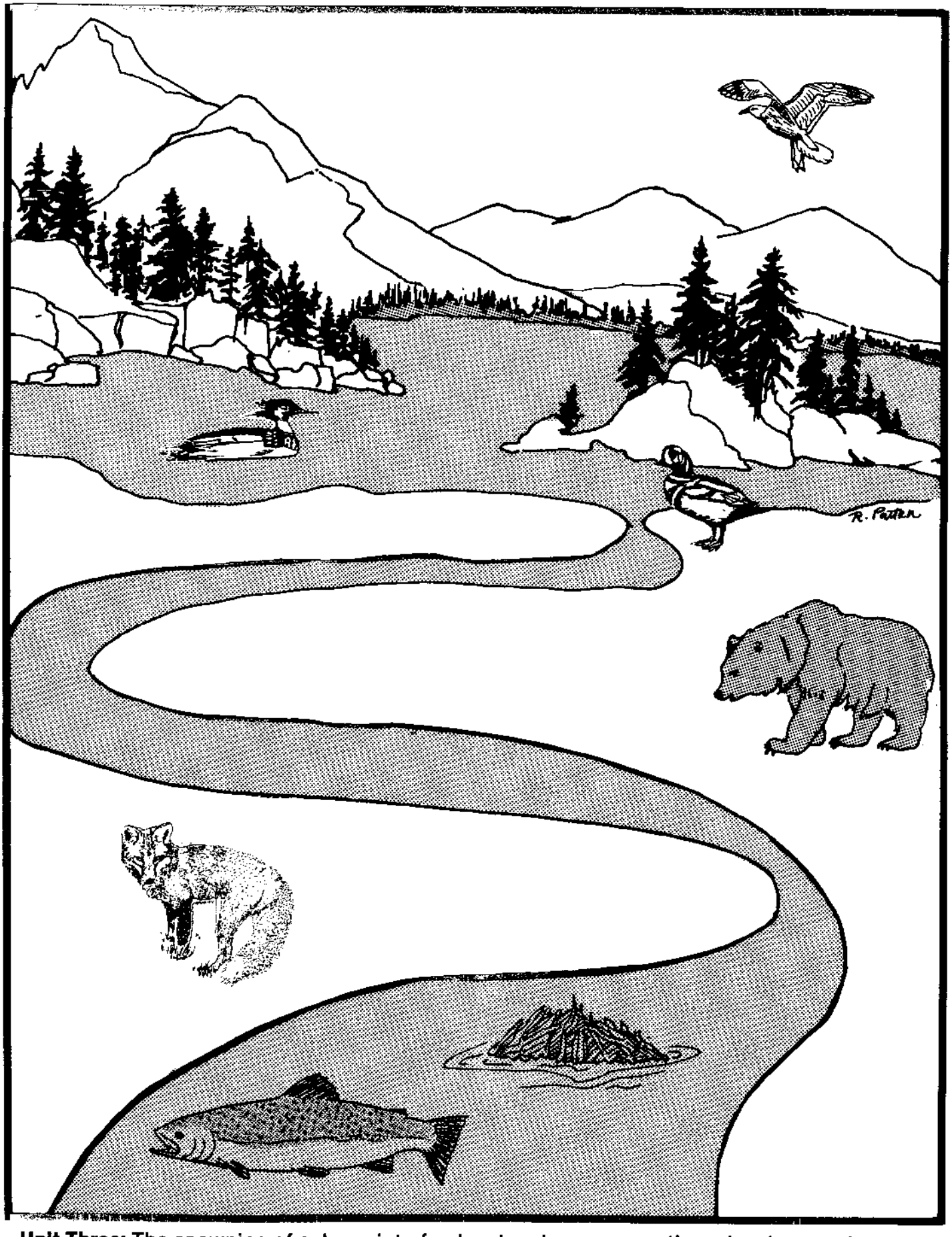
Unit Three
Fish in the Field

Index

Objectives:

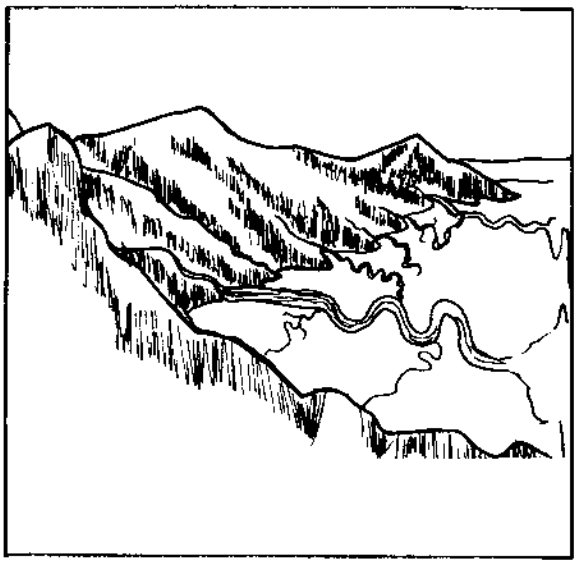
To help students:

- Map their own watershed (Activity 1).
- Diagram the hydrologic cycle (what happens when it rains!) (Activity 1)
- Explore the fish, wildlife and vegetation of a local stream (Activity 2)
- Measure stream flow and temperatures (Activity 2).
- Observe aquatic insects (Activity 3).
- Describe a stream bottom (Activity 2).
- Map pools and riffles and stream direction (Activity 2).
- Explore the fish, wildife, and vegetation of a local lake (Activity 3).
- Measure lake density and temperature (Activity 3).
- Describe a lake bottom (Activity 3).
- Sample a lake plankton (Activity 3).
- Map a lake's major features (Activity 3).
- Analyze data collected on field trips (Activity 4).
- Write a report on the stream or lake study (Activity 4).



Unit Three: The spawning of salmon into freshwater streams sometimes involves a migration of hundreds of miles from the ocean.

Activity 1
Mapping Your Watershed



Background:

Fish live in watersheds. A watershed is the region from which a stream or lake receives its supply of water; all the land that carries rainfall to the same river system.

Biologists are beginning to realize that 95 percent of what happens to a stream occurs outside its banks. To study fish habitat, it's necessary to look at everything happening in the watershed. The concept of watershed is particularly hard to understand, because so much is underground and out-of-sight in a series of underground rivers, streams, and reservoirs.

Vocabulary:

- watershed
- evaporation
- contour
- saturation
- hydrologic water cycle
- topography
- headwaters
- drainage
- tributary

Materials:

- large sheet of butcher paper
- felt-tip markers
- sponges
- water
- measuring cups
- flat pans with edges to hold water
- small and large pieces of plastic or plastic bags
- heat lamp or hot room
- tape or string
- local topographic maps
- paper
- pencils

Procedure:

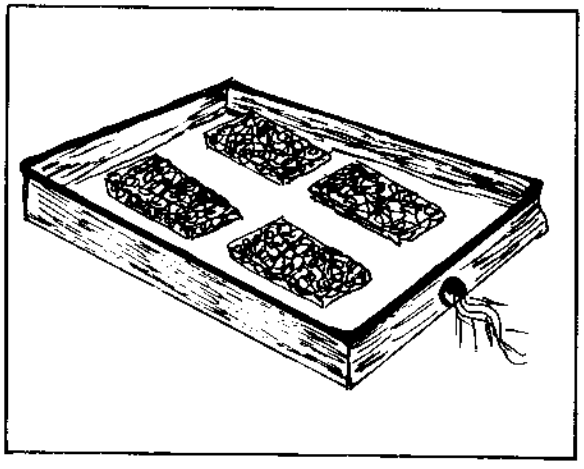
1. Introduce the term watershed as the area drained by a river or stream. Draw a picture on the board. Rain falling on the stream's side of the mountain goes down and is drained off by the stream. Drainage is a term used to describe the course the stream follows. The watersheds of several streams join to make up the watershed of a river.

2. Show students a topographic map that shows the area surrounding one of your local rivers or streams. Any large-scale map will suffice, but it's better to have one that shows the contours. Have students trace all the streams that go into the river. Each contour line is drawn at a specific elevation. For instance, the 100-foot contour line means that everywhere along that line the elevation is 100 feet. The area where the stream or river begins is called the headwaters. Streams that form the river are called tributaries.

3. Have students draw their local watershed on a large sheet of butcher paper with felt-tip markers. Add features such as the site of your town or village, cabins, fish camps, roads, dams.

4. Show students how a watershed works by pouring measured amounts of water (rain) on sponges (the land) in a pan (bedrock or permafrost). Tilt the pan on its side and poke a hole (the stream) in the bottom of the lower edge, so students will get an even more realistic picture of a watershed. Now try several experiments:

   a. What happens if it rains



   just a little? (Pour a little measured amount of water on the "land." The sponges soak it up. This is a very good analogy for Alaska--as most of Alaska is wetland--soggy, spongy ground that just soaks up the water when it rains or snows and slowly releases it later.)

   b. What happens when it rains a little more? (The watershed continues to soak up the water. Now cover your whole pan with a large piece of plastic bag. Tape or tie it strongly around the pan. The bag represents the earth's atmosphere.)

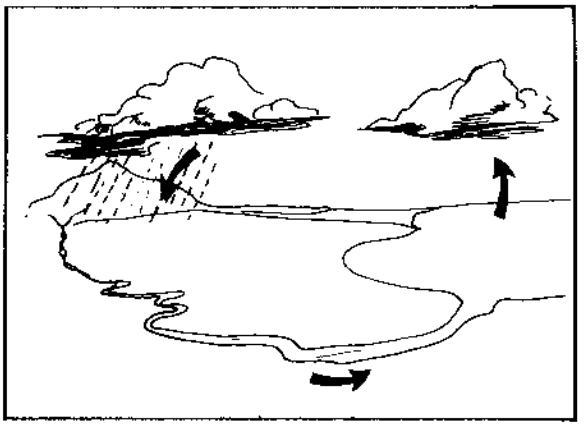
   c. What happens when the sun comes out? (Use a heat lamp or leave the pan overnight in a hot room. You should see droplets of water forming on the underside of the plastic. The water slowly evaporates from the "land." Eventually the droplets form clouds and under the right conditions rain again. This is called the hydrologic cycle which means that water is never lost, but it just keeps changing form.

   d. What happens when it rains a lot? (Better do this part over the sink! Take off the plastic bag and slowly pour a greater measured amount of water on the "land." At first the land soaks up the water but eventually it floods. Note the measurement at which it first starts to flood.)

   e. What happens when people disturb the watershed by building on top of it? (Cover some of the sponges with a piece of plastic or plastic bag to illustrate that when you build a house or pave a parking lot, the water doesn't have a chance to soak in. Pour

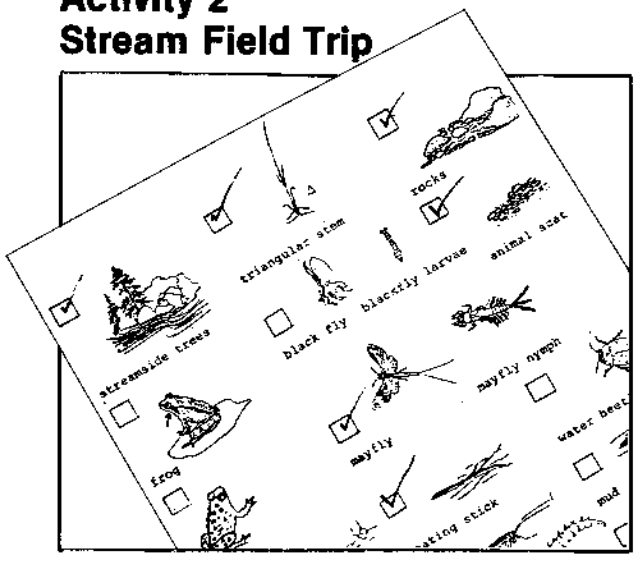
water on the watershed and see how much water it takes to flood it this time.

5. Have students draw pictures of what's happening on the watershed. They should show the hydrologic cycle, plus local events that are affecting the watershed. What happens in the headwaters is important downstream. Undisturbed headwaters mean a steady, constant supply of water instead of floods and dry spells. Wetlands along the banks of



streams and rivers help assure this steady, constant supply of water for drinking, cooking, washing, transportation and fish habitat.

Activity 2
Stream Field Trip



Background:

Streams and rivers are places to explore. The moving water and streamside vegetation provide habitat for an array of fish and wildlife.

Vocabulary:

- riffle
- pool
- current
- meander
- velocity
- flow
- aquatic
- transect

Materials:

- maps, charts, aerial photos of your area
- flagging tape or colored streamers
- pencils
- magnifying lenses
- binoculars
- stop watch or watch that marks seconds
- thermometers
- yardsticks
- 100-foot measuring tape
- sampling screens
- white enamel pan or pie pan painted white
- litterbag
- local resource person
- field guides
- snack or lunch
- worksheets:
  ...Stream Checklist (3A)
  ...Stream Transect (3B)

Procedure:

1. Select a local stream (or river) for your field trip. Look at maps, charts, and aerial photos of your area. Pick one that has fish plus easy access. Local resource people (fisheries biologists, village elders, fishermen) may be able to help, or even offer to go along.

2. Plan your stream visit to include:

   a. structured learning
   b. summary or review
   c. litter pickup and snack or lunch

   The Stream Checklist worksheet can be used intially or in conjunction with the Stream Transect worksheet. You may also want students to work on language arts or art projects. The summary can take the form of every student (and adult) telling what they liked or learned that day. Litter pickup can be slightly modified to take on a stream or fish theme, i.e., pile filled litter bags in fish shapes.

3. Send home transportation and permission slips and invite parents to participate as group leaders. High school students can be group leaders

if they are well prepared. If possible, meet in advance with your group leaders. Visit the site and designate 100-foot sections of stream for each group to investigate. Mark the sections with flagging tape or colored streamers.

4. Get equipment together for the trip. Each group should have a thermometer, watch, yardstick, litterbag, magnifying lenses, pencils and copies of the two worksheets. Students may also want to make sampling screens and paint pie pans white for aquatic insect investigations. Go over the checklist, eliminating or adding animals to typify your area.

5. Prepare your students. You might want to do a "dry run" in which students wear rubber boots and bring rain gear and warm clothes. Show students the aerial photos, maps and charts. Lay out a model stream on the classroom floor. Explain to students that they will be doing a scientific study of the stream and later writing a scientific report about their findings. Divide students into teams of four to six, and have each team survey a 10-foot section of the stream with the Stream Transect worksheet. Explain to students that is a transect a section of a particular habitat. They will be looking closely at one part of a stream; and by doing so, they will have a better idea of what the entire stream is like. Then preview the rest of the worksheet.

Location of transect: When biologists do studies like this one, it's very important that they know where they are so that they can go back another time to see if any changes have occurred.

Temperature: Have students practice using the thermometers. Can they predict the temperatures of their streambank, water, and air?

Stream bottom type: Ask students why the bottom is important. (Because that's where fish often feed and usually spawn. Some types of fish will spawn only where the gravel is a certain size. Other fish like a muddier bottom. Some aquatic insects will live only on certain types of stream bottoms. Students should write down what the bottom is like--sandy, muddy, small gravel, rock.)

Average stream depth and width: Students can use their yard sticks or meter sticks.

Fish species, size, and numbers: Because fish are under water, it's sometimes difficult to tell what kind they are; but students should do the best they can. Quietness at the bank of the stream is important to keep from frightening the fish. If a fisheries biologist or someone with a fish collecting permit is along, your class may be able to use seines, dipnets, or minnow traps to show the students what is in the stream. Students might also try dropping salmon eggs or bread crumbs quietly on the surface of a stream pool and see if any fish arrive to feed. Another possibility is sport fishing. How long does it take your students to catch a fish? What lures or baits work best? (Be sure to comply with sport fishing regulations.)

Aquatic insects: By drawing pictures of what they find, students may be able to identify the insects later. There is a good section on aquatic insects in Volume 2 of the Sea Week Curriculum Guide series. Look under rocks and sticks for the insects but be sure to put them back so their homes are disturbed as little as possible. Students may also want to make a sampling screen to check for aquatic insects. Have students kick up rocks and debris upstream from the screen so insects are dislodged onto the screen. Place the insects in water in a white enamel plan or pie pan painted white for observation and identification before releasing them.

Birds and mammals: List any birds and mammals that students find on their transects. Any observed elsewhere may be checked off on the checklist. Several bird identification guides are listed in the bibliography.

Animal tracks: Again, if students draw careful pictures they may be able to identify the tracks later. Local people who spend a lot of time outdoors plus Olaus Muries A Field Guide to Animal Tracks should be very helpful. Have students be sure and measure not only the size of the tracks, but the distance between them. Another option is to give each group a package of plaster-of-Paris with which to make casts of bird and animal tracks.

Streamside vegetation is important to fish. It provides shade to keep the water cold, insects falling from the vegetation are eaten by fish. Leaves also fall into the water, providing food and nutrients for aquatic insects, which are in turn eaten by fish. Logs and branches which naturally fall into the stream make good hiding places for fish.

Velocity is the speed of flow, measured in feet per second. To figure the average velocity of a stream, measure off a set length such as 20 feet. Then drop in a stick or an orange--anything that floats. Use the second hand on your watch to see how long it takes to go 20 feet. If it took 5 seconds, the velocity would be 4 feet per second. Experiment several times to check the accuracy of your measurement.

Pools and riffles: Pools are deep areas in streams or rivers where the current is slow. Riffles are shallow portions of streams or rivers where the current is fast. The ratio of pools and riffles in a stream helps determine how many fish can live there because fish need both types of habitats. Pools are good resting spots. Riffles add oxygen by mixing water with the air as little waves form. Also, different kinds of aquatic insects are found in each area. The more a stream or river meanders or curves back and forth, the less steep it is and the easier for fish to go up and down, and the more fish habitat is present because the distance covered is longer than would be covered by a straight line.

Additional observations: Sometimes it's the small things you notice that later turn out to be the most important, so encourage your students to take careful notes.

6. Ask students to make up some rules for the trip to protect the animals and plants of the stream (step softly and carefully, turn rocks or logs back over so the animals who like the moist environment

underneath can survive, leave everything just as found, pick up litter). Discourage collecting unless for a specific purpose such as an art project or freshwater aquarium.

7. Review safety procedures:

   - Stay together. Have a buddy. If you become lost, stay where you are and call out periodically.
   - Dress warmly and keep dry.
   - Stay a safe distance from the water (If you will be visiting a river, you may want to bring several life rings with lines attached and have the students practice throwing them).
   - Be careful of slippery mud, rocks, and logs.
   - Help each other.
   - Carry a first aid kit.

8. Plan follow-up activities. (See Activity 4 in this unit.)

9. Enjoy the trip!

Activity 3
Lake Field Trip

Background:

Lakes generally are large, deep bodies of water with rotted plants growing on their edges, in comparison to ponds which are small and usually shallow. Lake Illiamna is Alaska's largest, but other lakes of considerable size are located throughout the state. Most lakes were formed by the scouring and erosion of glaciers in the distant past. If large enough, lakes can alter local climate by moderating temperatures. They may also produce foggy conditions and cause snowfall on their lee sides. Lakes are constantly changing, and geologically are a comparatively short-lived phenomena. Lakes are continually filling in and have a life span of a few thousand to tens of thousands of years. Limnologists study lakes. Limnology is the formal, scientific study of lakes, ponds, rivers, and streams. The study also is called freshwater ecology or "inland oceanography."

Vocabulary:

- transparency

- secchi disk
- vegetation
- emergent
- plankton (review)
- aquatic (review)
- transect (review)

Materials:

- plankton nets
- secchi disk
- thermometers
- pencils
- magnifying lenses
- flagging tape or colored streamers
- 100-foot measuring tape
- rulers
- maps, charts aerial photos of the lake
- local resource persons
- binoculars/spotting scope
- litter bags
- large cans
- field guides
- white enamel pans or pie pans painted white
- life rings with ropes attached
- worksheets:
  ...Lake Checklist (3C)
  ...Lake Transect (3D)

Procedure:

1. Select a local lake (or pond) for your field trip. Look at maps, charts, and aerial photos of your lake. Pick a part of the lake to explore that has a variety of habitats (wetlands, river or stream inlet or outlet, heavy fish or bird concentrations, etc.). Local resource people (fisheries biologists, village elders, fishermen, birdwatchers) may be able to help.

2. Plan your lake visit to include:

   a. structured learning
   b. summary or review
   c. litter pickup, snack or lunch

   The magnifying lenses and worksheet Lake Checklist can be used initially or in conjunction with the worksheet Lake Transect. You may also want students to work on language arts or art projects. The review can take the form of every student (and adult) telling what they liked best, or their favorite learning experience that day or each team can come up with a summary statement. Litter pickup can be a separate activity or just a continual part of the field study. If you have extra time at the end while waiting for transportation, play fish tag where a few "bears," "gulls," and "eagles" try to catch the "fish" (the rest of the students).

3. Arrange transportation and send home permission slips. Invite parents to participate as small group leaders. High school students can also be small group leaders if they are well-prepared ahead of time. If at all possible, meet with your group leaders ahead of time and go over what you'll be doing. Visit the site and lay out 100-foot sections along the lake shore for each team of four to six students to investigate. Mark the sections with flagging tape or colored streamers.

4. Gather equipment. Each team of four to six students should have a thermometer, plankton net, secchi disk, ruler, a large can, litterbag, magnifying lenses, white enamel pans or pans painted white, pencils

and copies of the two worksheets. Try to locate a spotting scope and tripod in case there are birds on the lake. Go over the checklist, eliminating or adding animal and plants typify your area. Have the students assist in making plankton nets and secchi disks if you don't have any on hand.

5. Prepare your students. Try a "dry run" several days before the field trip. Have students wear short rubber boots or hip boots and bring rain gear, binoculars, and warm clothes. Show students the aerial photos, maps, and charts. Lay out a model lake on the classroom floor. Divide the class into teams of four to six students, and have each team survey a 10-foot section of the lakeshore. The teams should be numbered consecutively along the shore. Remind the students that a transect means a section. By looking closely at one section of the lake, they'll have a better idea of what the whole lake is like. Then go through the different parts of the worksheet.

Location of transect: When biologists do studies like this one, it's very important that they know where they are so that they can go back another time to see if any changes have occurred.

Temperature: Have students practice using the thermometers. Can they predict the temperatures of their lakeshore, water, and air?

Lake bottom type: Ask students why the bottom is important. (Because that's the home of aquatic insects on which the fish feed. Some types of insects will live only on a certain type of bottom. Red salmon and some other fish do spawn in lakes and they like bottoms of certain types. Students should write down what the bottom is like: sandy, muddy, gravelly, rocky.)

Estimated lake size: This information probably would be easiest to collect before the field trip from maps, charts, and aerial photos. Size can be estimated in acres or length and width in miles.

Fish species, size, and numbers: Because fish are under water, it's sometimes difficult to tell what kind they are; but students should do the best they can. Quietness at the lakeshore is important to keep from frightening the fish. On their transects, each team should count in the same direction so that fish aren't counted twice as they move around the lake. If a fisheries biologist or someone with a fish collecting permit is along, students may be able to use seines, dipnets, or minnow traps to see what's in the lake. Students also might try dropping salmon eggs or bread crumbs quietly on the surface and see if any fish arrive to feed. Another way to check for fish is by sport fishing! How long does it take your students to catch each fish and what type of baits or lures work best?

Aquatic insects: By drawing pictures of what they find, students may be able to identify the insects later. There is a good section on aquatic insects in Volume 2 of the Sea Week Curriculum Guide Series. Look under rocks and sticks for the insects, but be sure to put them back so their homes are disturbed as little

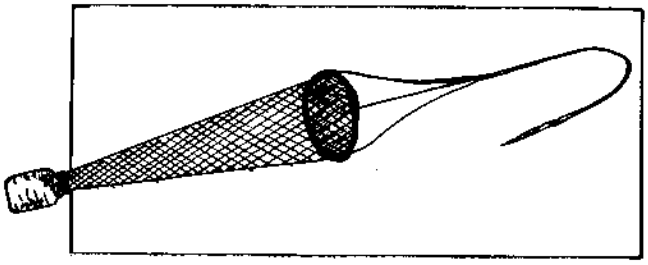
as possible. Also collect a sample of the lake bottom with your can. Dump the contents into the white pan and carefully sort through the mud or gravel looking for aquatic insects. Return the insects to the lake after each student has observed, drawn, and taken notes on the "finds."

Birds and mammals: List any that students find on their transects. Any observed elsewhere may be checked off on the checklist. Spotting scopes and binoculars could be helpful. Take along bird field guides to help with identification. Several suggested guides are listed in the bibliography.

Animal tracks: Again, if students draw careful pictures, they may be able to identify the tracks later. Local people who spend a lot of time outdoors plus Olaus Murie's A Field Guide to Animal Tracks should be very helpful. Have students be sure and measure not only the size of the tracks, but the distance between them. Another option is to give each group a package of plaster-of-Paris with which to make casts of bird and animal tracks.

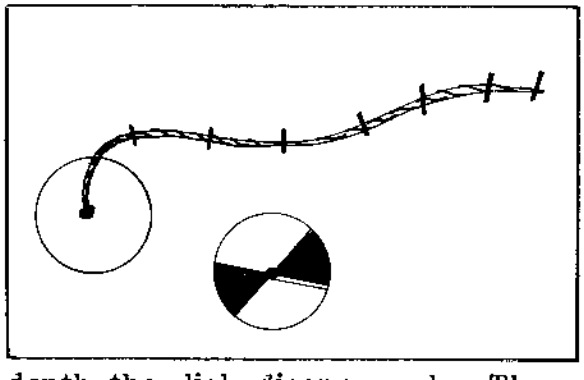
Lakeshore vegetation is important to fish. They provide shade to keep the water cold, and insects falling from the vegetation are eaten by fish. Leaves also fall into the water, providing food and nutrients for aquatic insects, which are in turn eaten by fish. Logs and branches which naturally fall into the lake make good hiding places for fish.

Lakes may have pondweeds and water lilies growing in the water, shore vegetation on the land, and emergent vegetation (plants that grow half in and half out of the water). Emergent vegetation and the deeper pondweeds are excellent hiding places and feeding places for young fish. Larger fish come into the shallows to try to find and feed on the little ones.



Plankton. Drag your plankton net under water for the length of your transect. Then put your lid on the sample. Hold the jar up to the light and see if you can see any tiny plants or animals. This plankton is what many of the smaller fish and some of the bigger fish eat.

Secchi disk. Try to find a good spot to lower your secchi disk in the water to measure the clarity or transparency of the water. Lower the disk slowly until you can't see it anymore. Mark down at what



depth the disk disappeared. Then lower the disk even farther, and slowly bring it up. Mark down the depth at which the disk appeared. Now take the average of the two depths and that is the secchi disk reading.

Ask students: Do you think this reading would be the same year-round? (No, because plankton blooms in the spring and reduces

some of the clarity. Also, many Alaskan lakes are influenced by glaciers, so when the glaciers are melting in the summer, the lake transparency is reduced.)

Lake map. Students should draw a rough map of the lake and add features that they notice plus any additional observations.

If the class has access to a boat (and life jackets), additional measurements of plankton transparency, temperature, and depth can be recorded. Lake measurements also can be taken in the winter by drilling holes through the ice.

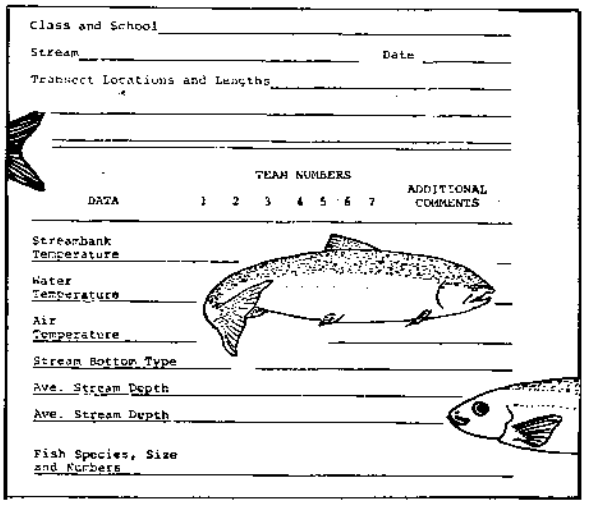
6. Ask students to make up some rules for the trip to protect the animals and plants of the lake. (Step softly and carefully, turn rocks or logs back over so the animals who like the moist environment underneath can survive, leave everything just as found, pick up litter.) Discourage collecting unless it's for a specific purpose such as an art project or freshwater aquarium.

7. Review safety procedures.

8. Plan follow-up activities. (See Activity 4 in this unit.)

9. Enjoy the trip!

Activity 4
Data Analysis and Report Writing



Background:

Field studies are fun; but if the data is not carefully analyzed and written up, it is of little use. Students can contribute to scientific knowledge, especially in Alaska where, due to the state's vastness and small population, comparatively little is known biologically. Especially helpful are long-term studies (in your class's case, perhaps yearly studies of the same stream or lake).

Vocabulary:

- abstract
- goals
- introduction
- method

Materials:

- data from lake and/or stream field studies
- paper
- pencils
- large sheet of newsprint or butcher paper
- felt-tip markers
- field guides
- graph paper

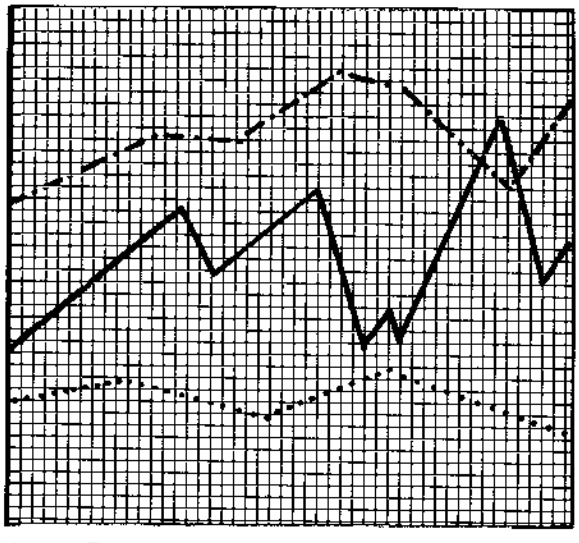
- worksheets:
  ...Stream Data (3E)
  ...Lake Data (3F)

Procedure:

1. Have each team go over its data, perhaps copying the information onto another sheet if the writing is illegible. Use field guides and other reference books to identify unknowns. Post completed data sheets where they can be studied and compared.

2. Make a class mural of the lake or stream with large sheets of butcher paper and felt-tip markers. Transfer information and observations into pictures and notes on the mural.

3. Pass out the worksheets Stream Data and/or Lake Data. Have each team copy information from the other teams' investigations.



4. Pass out graph paper and have each student graph the air, water and land temperatures.

5. As a class discuss, the information. You may want to ask a local biologist for help in the data analysis. Ask the students:

   - Do you notice any trends as you move upstream or downstream, or from one part of the lake to another?
   - What additional things would you like to know about this stream or lake?
   - What types of fish is this stream or lake suitable for?
   - What would you do differently if you were doing this study again?

6. Have the students write reports of their findings. Include drawings and graphs. Begin with an abstract--a couple sentences about the purpose of your study and your findings. Next write an introduction (a few sentences introducing a stranger to your local stream or lake and to your class study including your goals (what you hoped to achieve by the study)); method (how you collected your data); results (what you found out, any trends you noticed, and your Stream Data or Lake Data worksheets) and finally, a summary of your study.

7. Ask the students:

   - How would you rate this stream or lake as fish habitat?
   - Is there anyone who would be interested in our reports? (Newspaper, community groups, village or town government, local planners, parents.)

- Are any developments planned for this stream or lake or the surrounding watershed?

- How might our reports have an effect on the future uses and resources in this area?

- Is there anything further we should do? (Write a story or take photos to give to the local newspaper; write letters to the editor; make a slide show or videotape about our stream or lake; make a presentation with maps, charts, our mural and reports to a community group; etc.)

Additional Activities:

1. Art, Language Art, Science: Have students fold an 11-inch by 18-inch paper into eight equal parts. On the top four spaces have them drawn an event from the field trip. On the bottom four spaces have them write two facts related to each event. (Suggested by Ann Schultz, Mt. Eccles Elementary, Cordova)

2. Language Arts, Science: Have students pick one aspect of their field study that interests them, and research and prepare an oral and/or written report on that topic.

3. Science: Have students figure out what types of fish their stream is suitable for, based on the data they collected.

3A

Stream Checklist

☐ 

Dipper or water ouzel

☐ 

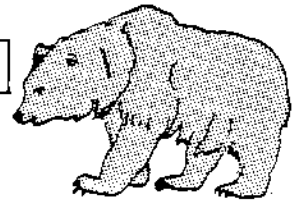
gull

☐ 

kingfisher

☐ 

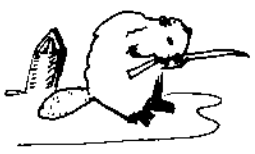
harrlequin duck

☐ 

bear

☐ 

fox

☐ 

beaver

☐ 

mink

☐ 

muskrat

☐ 

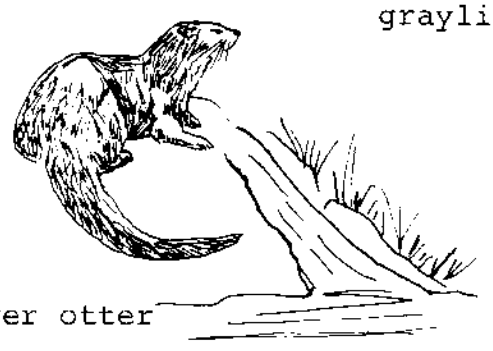
muskrat pushup

☐ 

beaver lodge

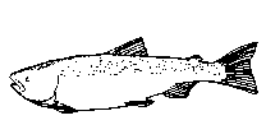
☐ 

tracks

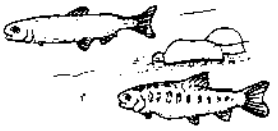
☐ 

river otter

☐ otter slide

☐ 

salmon adult

☐ 

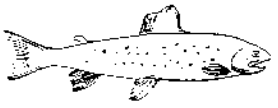
salmon fry

☐ 

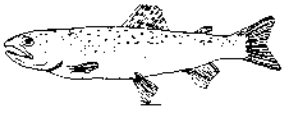
salmon smolt

☐ 

salmon eggs

☐ 

dolly varden

☐ 

trout

☐ 

grayling

☐ 

streamside trees

☐ 

triangular stem

☐ 

rocks

☐ 

frog

☐ 

black fly

blackfly larvae

☐ 

animal scat

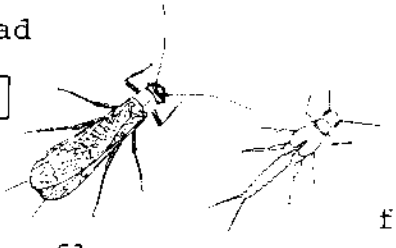
☐ 

toad

☐ 

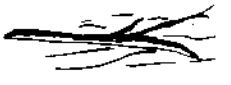
mayfly

mayfly nymph

☐ 

stonefly

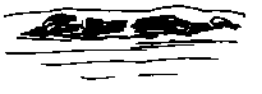
stonefly nymph

☐ 

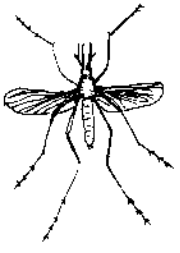
floating stick

☐ 

water beetle

☐ 

mud

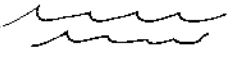
☐ 

mosquito

☐ 

caddis fly

caddis fly larvae

☐ 

riffle

☐ 

mosquito larvae

☐ 

gravel

☐ 

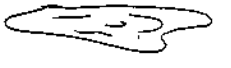
fairy shrimp

☐ 

streamside bushes

☐ 

round stem

☐ 

pool

Stream Transect

STREAM TRANSECT-TEAM #_____

Team Members_____ Date_____

Name of Stream_____

Location of transect_____

Transect length_____

Streambank temperature_____ Water temperature_____

Air temperature_____

Stream bottom type_____

Average stream depth_____ Average stream width_____

Fish Species Size Numbers

_____

_____

_____

_____

_____

Draw pictures of the aquatic insects found in your transect.

List birds or mammals observed in your transect

_____

_____

Draw pictures of animal tracks or signs found in your transect.

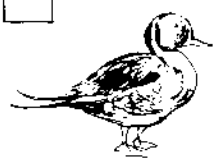
Describe the streamside vegetation along your transect.

_____

_____

Make a map of pools and riffles on the back of this sheet and add any other observations.

Lake Checklist

☐ 

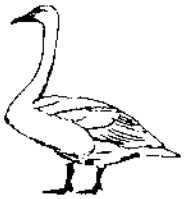
pintail

☐ 

mallard

☐ 

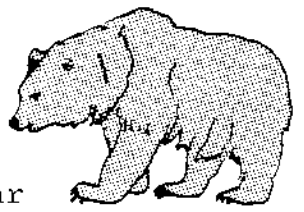
gull

☐ 

trumpeter swan

☐ 

Bald eagle

☐ 

bear

☐ 

sheefish

☐ 

muskrat

☐ 

muskrat pushup

☐ 

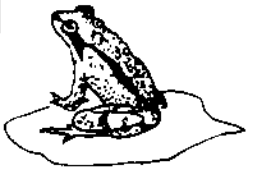
beaver

☐ 

beaver lodge

☐ 

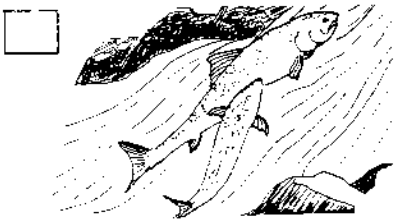
animal tracks

☐ 

frog

☐ 

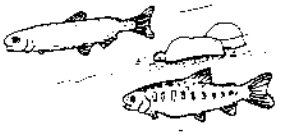
toad

☐ 

salmon adult

☐ 

Salmon eggs

☐ 

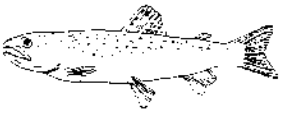
Salmon fry

☐ 

salmon smolt

☐ 

dolly varden

☐ 

trout

☐ 

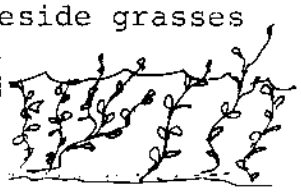
burbot

☐ 

water lilies

☐ 

Lakeside grasses

☐ 

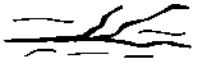
pondweeds

☐ 

log in water

☐ 

rocks

☐ 

floating stick

☐ 

animal scat

☐ 

lakeside bushes

☐ 

lakeside trees

☐ 

water flea

☐ 

caddis fly adult

☐ 

caddis fly larvae

☐ 

damselfly adult

☐ 

predacious diving beetle adult

☐ 

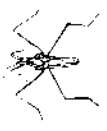
dragonfly adult

☐ 

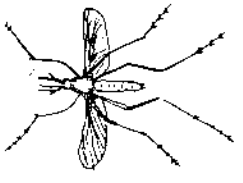
dragonfly nymph

☐ 

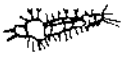
water boatment

☐ 

water strider

☐ 

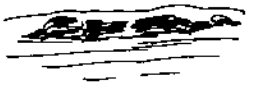
mosquito

☐ 

mosquito larvae

☐ 

gravel

☐ 

mud

Lake Transect

Transect Team # _____

Date _____

1. Team Members _____

2. Name of Lake _____

3. Transect Location _____

   Transect Length _____

4. Lake shore temperature _____

   Water temperature _____

   Air temperature _____

5. Lake bottom type _____

6. Estimated lake size _____

7. Fish Species Size Numbers

   _____

   _____

   _____

   _____

8. Draw pictures of the aquatic insects found in your transect.

9. List birds and mammals observed in your transect.

   _____

   _____

10. Draw pictures of animal tracks or signs found in your transect.

11. Describe and draw the lakeside vegetation along your transect.

12. Collect a plankton sample.

13. Take a secchi disk reading. At what depth does the disk disappear?

_____

14. Make a rough map of the lake on the back of this sheet and add any additional observations.

Stream Data

Class and School _____

Stream _____ Date _____

Transect Locations and Lengths _____

_____

_____

DATA	TEAM NUMBERS 1	2	3	4	5	6	7	ADDITIONAL COMMENTS
Streambank Temperature								
Water Temperature								
Air Temperature								
Stream Bottom Type								
Ave. Stream Depth								
Ave. Stream Depth								
Fish Species, Size and Numbers								
Aquatic Insects								
Birds and Mammals								
Animal Tracks								
Streamside Vegetation								
Velocity								

Lake Data

Class and School _____

Lake _____ Date _____

Transect Locations _____

_____

_____

_____

DATA	TEAM NUMBERS 1	2	3	4	5	6	7	ADDITIONAL COMMENTS
Lake Shore Temperature								
Water Temperature								
Air Temperature								
Lake Bottom Type								
Estimated Lake Size								
Fish Species, Size and Numbers								
Aquatic Insects								
Birds and Mammals								
Animal Tracks								
Lakeside Vegetation								
Plankton								
Secchi Disk Reading								