Connecting Students With Their Watersheds

a workbook for community leaders

SAMPLE PAGES

by
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Bowen Island Conservancy

Special Thanks to:

The authors wish to express special thanks to the following people:

Rob Knight
Stewardship Advisor,
Urban Salmon Habitat Program (USHP)
for his expert assistance in reviewing the project grant application and his input to the project steering committee.

Kerrie Post
of WILD BC
for use of many of the photos in this document, and her input to the project steering committee

Bob Turner and Velibor Veljkovic
of the Geological Survey of Canada
for permission to use the watershed diagram on page 6 of this document.

The Board of the Bowen Island Conservancy
for funding and support throughout this project.

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The is a project of the

Bowen Island Conservancy

June 2001

Distributor

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Funding for this project came from:
a grant from the Urban Salmon Habitat Program
British Columbia Ministry of Water, Land and Air Protection

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Getting Started

Who This Workbook is For

This workbook is for individuals and stewardship-group members who wish to increase community involvement in stewardship activities by working with elementary school-aged children and their teachers. Service groups such as the Girl Guides and Boy Scouts can also use the principles outlined here.

You may be any of the following:

- a person who will deliver a school or education program
- a trainer of those who will deliver the program
- a committee member guiding collaboration with your local school
- a committee member responsible for exploring programming options and contacting schools and community groups
- a teacher who is also a member of a community stewardship group
- any combination of the above

You may be a seasoned veteran who has developed and presented many projects with students and teachers or you may be just starting out and have little idea of your needs. You may be concerned about your watershed and want to educate children about the issues that affect its health. Perhaps more likely, you are concentrating on an area within your watershed – a stream cleanup or a salmon enhancement project. Whatever your skills or position, if you want to work with elementary school-aged children, this workbook will guide you through an effective planning and delivery process.

This book is part of a series on watershed stewardship encompassing the Georgia Basin. Many workshops, focus groups, and interviews were conducted to gain the best advice and help for stewardship leaders like you. To check where you fit in and to learn how the other books in this series may help you, look at the document road map on the following page.

What This Workbook Does

This workbook provides information on how to involve educators and primary school-aged children in your projects. It also contains advice on how to develop programs that will be effective for this target group. The document will lead you through the process of:

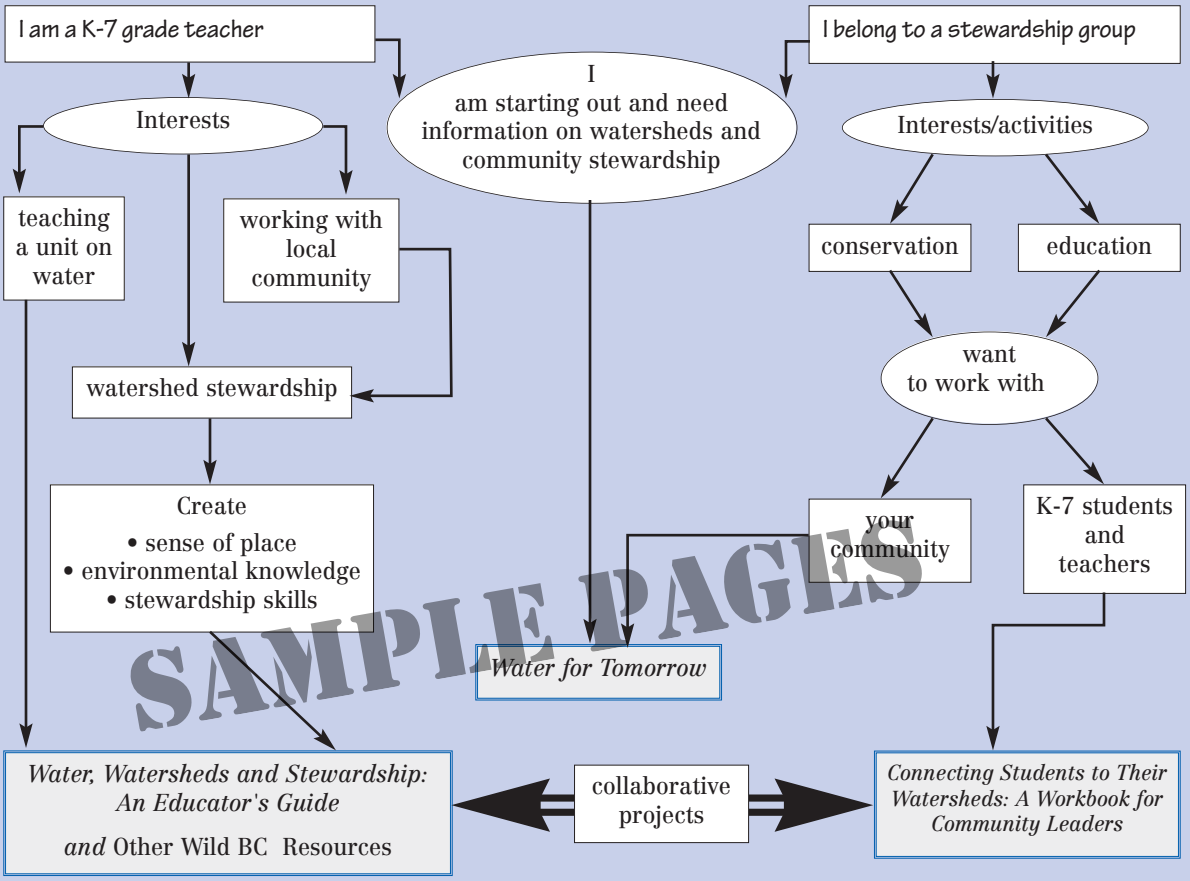
- Identifying ways of working with teachers and elementary school-aged children
- Selecting from among program options
- Preparing a Participant Analysis program that will clearly identify the characteristics and needs of the students you wish to involve
- Developing goals and objectives that clearly identify what students and teachers will do and learn
- Preparing a program plan to achieve these objectives
- Implementing the plan using good practices in leading groups
- Evaluating your effectiveness by identifying strong and weak parts of your program

Please Note

This workbook is not an activity guide. For an excellent selection of watershed stewardship activity guides, see the Stewardship Project Activity Guides and Tools references at the end of this book.

Watershed Stewardship Document Road Map

Wild BC is supporting a series of documents, developed by agencies including the Bowen Island Conservancy and the Bowen Island Forest and Water Management Society. These booklets are designed to help community groups and individuals better understand watershed stewardship issues. Some also will help to develop educational programs and activities for public school students. Follow this road map to select the documents that suit your needs. Also, see Documents on the Road Map)



Documents On The Road Map

Connecting Students to their Watersheds

Water, Watersheds and Stewardship: An Educator's Guide

A guide for primary teachers guide to:

- the importance of water and its conservation;
- watersheds and their importance; and
- stewardship of natural resources.

Water For Tomorrow

First published in 1997, this booklet was written for community service groups, individuals, and municipal officials. It outlines the basics of watershed ecology, mapping, stewardship and watershed legislation.

How to Use this Workbook

This workbook is divided into a series of modules that contain information and tools. The modules can be used together or individually depending on:

your knowledge;

the complexity of your program; and

where you are in your planning and delivery process.

Checklists and Worksheets

Throughout this workbook there are checklists and worksheets to help you organize the various stages of planning, developing and assessing programs and projects. Use these tools as needed.

The Value of Hands-On Watershed Conservation Activities For Children

Studies in Canada and the U.S.A. have identified many effective education programs and activity packages that can help teachers and students learn about watershed conservation and develop a respect and concern for watershed issues. However, the same studies have found glaring gaps and missed opportunities in this educational forum. Key gaps in present watershed stewardship education include:

- Students may study the ecology and science of watersheds but most education programs don't put these studies in context of their own community.
- Students may learn about environmental action skills – things they can do to protect the environment – but they seldom get a chance to practice them.
- Students seldom get a chance at hands-on conservation action in their own communities.
- Students are seldom exposed to people engaged in watershed conservation related careers, community service or hobbies.

Community conservation groups are a key untapped resource that can help fill the gaps in watershed stewardship education (see sidebar How Can Elementary School-age Children Get Involved Your Stewardship Project?). By including local children in your work, you can furnish valuable, real-life experience that makes their abstract learning real and meaningful.

How Can Elementary School-age Children Get Involved in Your Stewardship Project?

There are many ways that students aged between 5 and 12 can be involved in local stewardship. This workbook concentrates on working with the teacher and the children through their school, but much of what you will find here can easily be adapted to summer camps, after-school activities, special events or intergenerational community projects.

There are three main styles of stewardship projects involving elementary school-age children. They vary according to their starting points.

Student-centred Projects

In this type of project, students develop an interest or concern and wish to work on a solution. Your community group may be asked to help them in their tasks.

Community-group Centred Projects

In this example, your community group develops the interest or concern. You initiate student involvement to broaden the scope, interest and educational value of the project.

Collaborative Projects

In this type of project, teachers, students and community groups join forces to identify issues or concerns. Together, you design a collaborative project that reflects the expertise, knowledge and abilities of all the participants.

Project or Program?

This workbook uses projects and programs to mean different products that your group may present.

Projects are student activities that are primarily stewardship actions. They may include a variety of operations such as mapping all or part of a watershed, taking part in a stream restoration or rearing and releasing native salmon into a community stream.

Programs are more education based, aimed at increasing student awareness, appreciation, understanding and commitment to aspects of watershed stewardship.

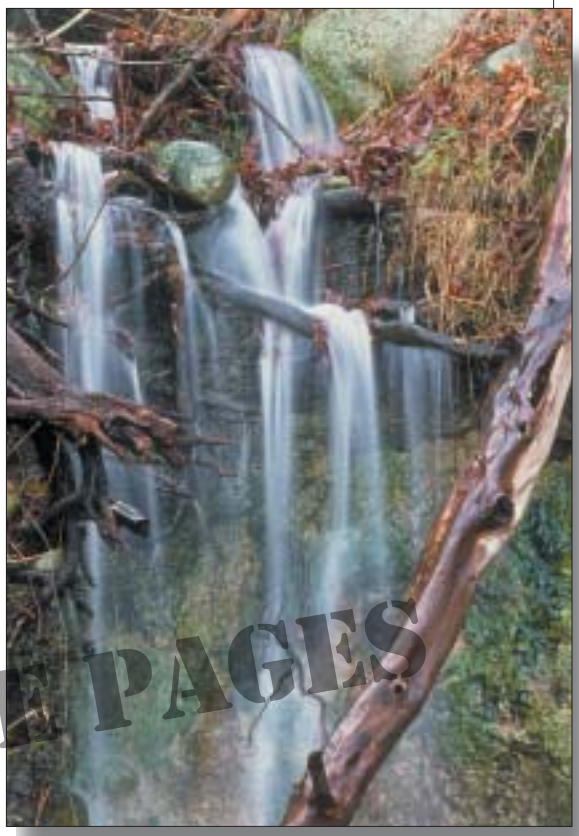
Module 1: A Sense Of Place

Pre-Test

Do you already have the knowledge covered in this module? Test yourself with the following questions. Check yes or no for each question. If all your answers are yes, you should move to the next module. If one or more of your answers are no, it may be useful to read through this module.

Can you:	Yes	No
1. Define Sense of Place and apply this concept to your watershed?	❑	❑
2. Describe and define your watershed?	❑	❑
3. Identify your group's strenths and weaknesses with respect to working on projects with students and teachers – with examples?	❑	❑
4. Identify the stewardship groups that play a role in your watershed. Describe how your group fits into the big stewardship picture?	❑	❑
5. State how students and teachers will benefit from working with your group?	❑	❑
6. State how your group will benefit from working with students and teachers?	❑	❑
7. List projects that your group and school or community groups can do together?	❑	❑
8. Indentify ways your project can fit into a teacher's schedule.	❑	❑
9. List five ways that you can contact teachers about your projects.	❑	❑

What Is A Sense Of Place?



A sense of place is an awareness of the diversity and beauty of a landscape or site in all its aspects through space and time. This awareness of place has tremendous scope including a sense of boundaries, location and importance of special places, the roles of natural and cultural forces, their past, present and future players.

Constructing a sense of place has a key role in developing education and interpretation material about our natural and cultural environment. People are pleased to know a landscape or historic site, and to understand its history. Indeed, a strong sense of place supports their sense of personal identity. For that reason, people will defend familiar landscapes and places all the more fiercely. Their empathy for special places engenders their commitment to stewardship of our cultural and natural environment.

Watershed Facts Part 1

What Is a Watershed?

Watersheds are nature's way of dividing up the landscape. Rain falls on the land, soaks into the soil or runs downhill toward the ocean. Surface water forms creeks, streams and rivers. Over time these watercourses dig channels and cut valleys that form natural drainage basins (see figure 1.1).

A watershed is a drainage basin consisting of a valley, or interconnected system of valleys, that contain a single river system (see figure 1.2). Each watershed is separated from the one adjacent by a height of land or ridge. Some writers use the term watershed to describe this height of land. To avoid confusion, this document will use watershed only to refer to a river drainage basin.

Key Features of Watersheds

Watershed Components

Watersheds have many living and non–living components, which co–exist and, in many ways, depend on one another. These components work together in complex ways.

Forests and Wetlands Maintain Watersheds

Forests and wetlands are critical to watershed health. Forests maintain water quality and regulate year-round supply by preventing erosion, holding water for slow summer release and maintaining cool temperatures. Wetlands – whether major swamps or tiny pockets of marsh, swamp or bog – store and purify water.

For a more detailed discussion of the components of watersheds function, see Chapter 2, How Watersheds Work, in *Water for Tomorrow*.

Human Uses

In addition to the natural systems that store and purify, maintain stream flow and recharge ground water, watersheds also contain and sustain the forests, farms and fisheries from which humans draw their livelihoods. The actions of people who live within a watershed affect the health of the water that drains from it (see figure 1.2).

Because watersheds are, in effect, closed systems, land managers are using them as standard units for studying sustainable land use and resource management. By understanding the water cycle and the other components of a watershed, landowners and planners can minimize the impact of development.

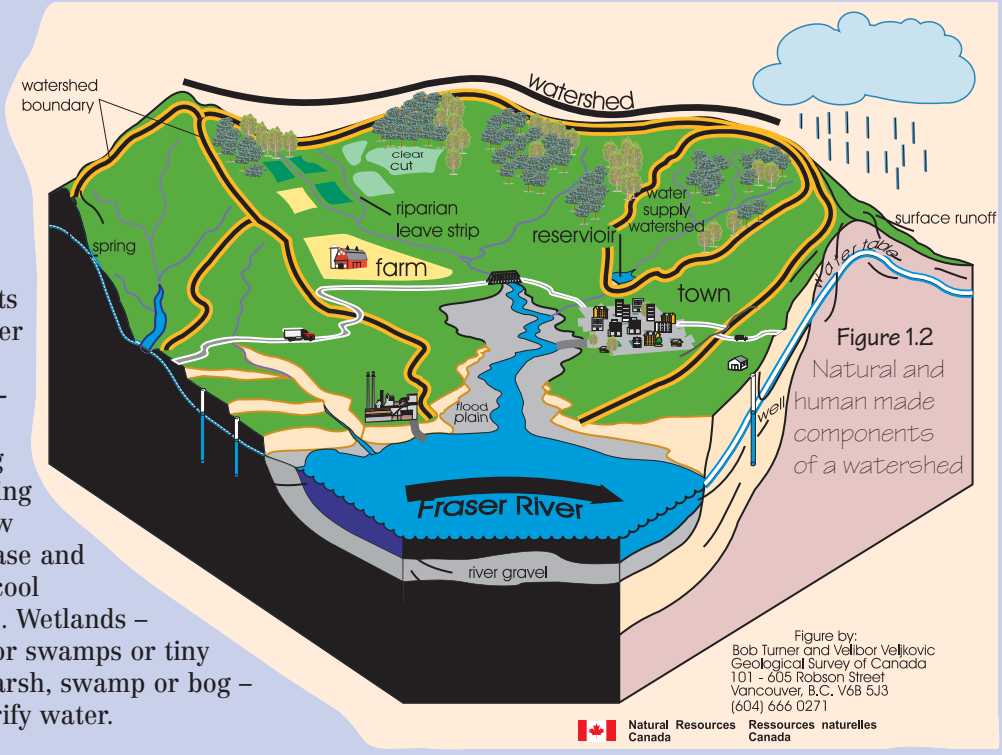


Figure 1.2
Natural and human made components of a watershed

Defining Your Sense of Place

Sense of place can include defining oneself in the context of the place you live. Landscape acts as teacher in shaping our perceptions of place. Four major emotional and spiritual bonds contribute to a sense of place. These are:

- Place Names
- Personal experience within a particular landscape.
- Local stories, including personal or group stories, and legends.
- Spiritual feelings and experiences with respect to a landscape.

Using Your Sense of Place

A clear sense of place makes an environment psychologically comfortable. When you have a strong feeling for a place you are more able to communicate its value.

Developing Your Sense of Place

Putting Boundaries on Your Watershed

Deciding on the limits of your watershed can be a challenge. Some watersheds are tiny systems that consist of a short, unnamed stream, draining several hundred hectares directly into the ocean. Others are huge systems like the Fraser River, containing many sub-basins and countless tributary rivers, streams and creeks.

Deciding on the boundaries of a small watershed is easy: most groups choose the whole thing. But what about communities located within larger watersheds? It makes little sense for a small, community-based group to tackle projects that concern all of a major watershed. Instead, they may concentrate on a sub-basin.

The following criteria may help your group decide on the watershed boundaries of interest to your group.

What Is Your Area of Interest?

Your group's mission statement, goals and

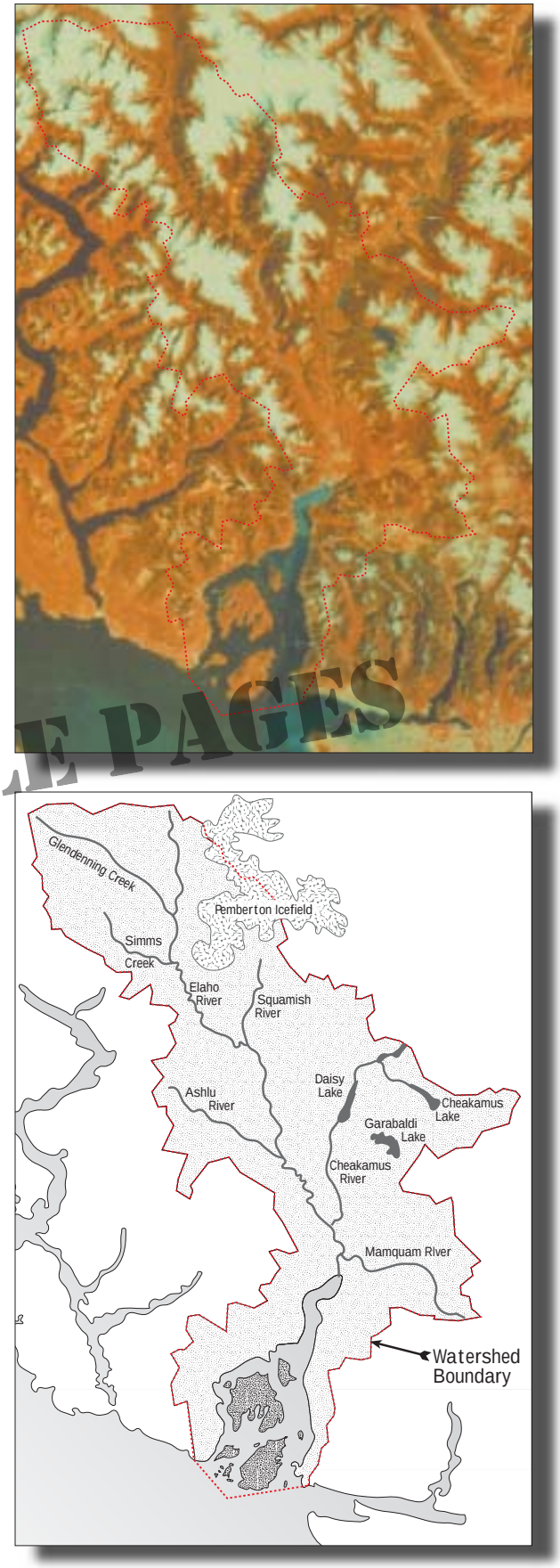


Figure 1.4 Squamish River Watershed a: Aerial photograph b: Line map

Watershed Facts Part 2

The Family of Watersheds

Watersheds can be big and complex, tiny and simple, or somewhere in between.

Complex Watersheds

Complex watersheds are usually large, consisting of a main river and several levels of tributaries (see figure 1.3a). First order streams (1) are the small headwater creeks that are the sources of the river system. These streams usually carry a small volume of fast-flowing water down a steep gradient. Vegetation from adjacent banks often meets over top of first order streams, leaving them in near-continuous shade. Higher order streams (2–4) gather the water in larger and larger channels. Many such streams have slower moving sections where material gathered upstream is deposited in sand and gravel bars. Eventually the highest-level stream releases its freshwater into the ocean.

The Squamish River Watershed (figure 1.4) is an example of a complex watershed.

The watershed served by a complex river system consists of several nested sub-basins (see figure 1.3b) or valleys, roughly corresponding to the order of streams in the system. Each sub-basin is a local watershed.

Simple Watersheds

Simple watersheds are usually small and short, containing a simple stream system – a first- and perhaps a second- and third- order stream. Simple watersheds are common in coastal BC where small rivers cascade down steep coastal mountains to the sea.

Focus on Small Local Watersheds

This book focuses on community groups working on stewardship of small local watersheds.

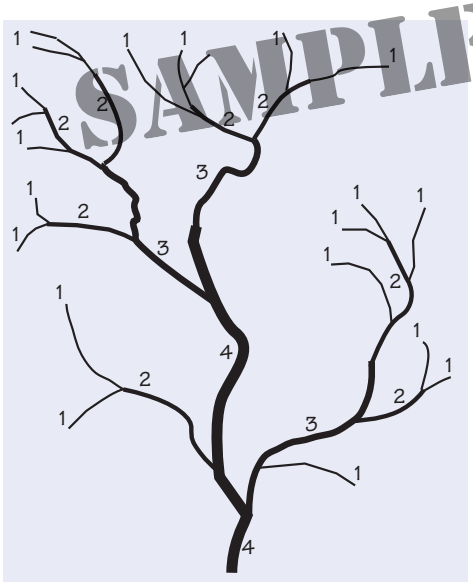


Figure 1.3a Stream Order
– a fourth order stream system
1. First order streams
2. Second order streams
3. Third order streams
4. Fourth order stream

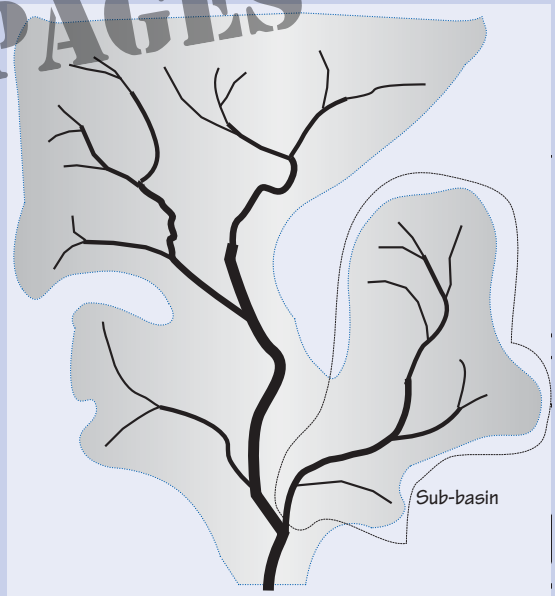


Figure 1.3 b Catchment Basins
The stream system drains a catchment basin which may contain smaller sub-basins or local watersheds.

objectives must first identify the size and location of your local watershed. Many stewardship groups' founding documents begin with a clear description of their watershed, its boundaries and components. For example the Bowen Island Conservancy's mission statement states:

> The mission of the Bowen Island Conservancy is to conserve, protect, sustain and enhance the quality of the natural environment and heritage of Bowen Island, neighboring islets and surrounding waters for the benefit of the inhabitants of Bowen Island and the province of British Columbia.

If your group has not yet clarified this issue, consider setting up a formal or informal discussion among your members to draft a clear mission statement.

Viewing Maps

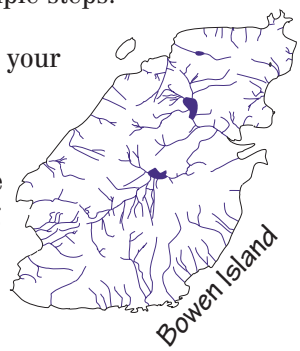
It is helpful to visualize your watershed in order to fully appreciate it. Maps provide you with a good first step toward understanding your watershed. Some watershed maps are available through the BC government's TRIM Watershed Atlas Project. In other cases, local conservancies and watershed societies must produce their own. Consult Appendix 2 for the names of groups that may have produced maps of your watershed.

Draw The Boundaries of Your Watershed

Knowing the boundaries of your watershed will be important when you look more closely at its stewardship. The boundaries help you determine what biophysical and human-made features the watershed contains. If existing maps do not delineate the boundaries of your watershed, the following methods will help you map these edges.

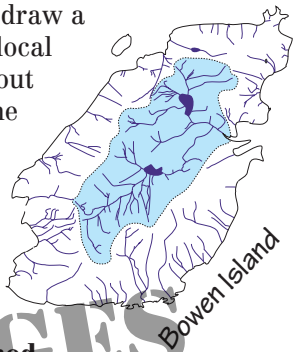
Simple Method

You can outline the boundaries of your watershed in two simple steps. Start with a line map showing the rivers in your community.



1. Using a pen or marker colour the lines representing your river system.

2. Using a different coloured marker, draw a line around your local river system without touching any of the rivers or streams on your map. Presto! you have a watershed map.



More Complex Method

For a more accurate picture, start with a large-scale topographic map that contains your community:

1. Using a pen or marker, colour the lines representing your river system.

2. Using a different coloured marker, follow the contour lines that separate your watershed's rivers from those in adjacent watersheds.

If you are looking for topographic maps, contact your local Maps BC dealer. A listing of dealers is available on the Maps BC web site: www.env.gov.bc.ca/gdbc/mapsbc/ or contact their Victoria Office:

Customer Support
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Victoria BC
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Tel: (250) 356-LAND (356-5263)
Fax: (250) 387-3022
E-Mail: support@mail.gdbc.gov.bc.ca

Explore Your Watershed

There is no better way to get to know your watershed than by getting out and walking through it. You may be able to tour a small watershed in less than a day. Large watersheds require more time and perhaps a car or four-wheel drive to access certain points. Even there, however, you should travel on foot whenever possible to become intimately familiar with the geography and features of your watershed. Some groups sponsor watershed walks for the entire community as part of an awareness project.

Giving Your Watershed A Personality

As you become more familiar with your watershed, you may wish to dig deeper to develop maps showing a wider understanding of its structure and history. The following are aspects to consider:

Biophysical Features

These are the natural resources of the watershed. Features that you may encounter include:

- bedrock geology
- soils
- forest cover
- wetlands
- rivers and lakes
- fish and wildlife
- vegetation
- riparian zones

You may find information in reports available through your municipality or regional district or through the provincial ministries of Fisheries, Forestry, and Environment, Lands and Parks. Many reports will include maps that may encompass part or all of your local watershed.

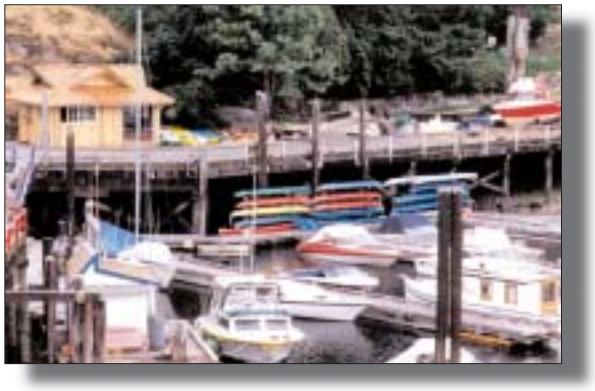
Human-Use Features

Present Use

Human use of lands within a watershed include:

- farming
- forest harvesting
- reservoirs and waterworks
- sewage disposal sites
- landfills
- towns
- industrial sites
- roads
- ports and harbours

Sources of information on human use include those listed above for biophysical studies and reports.



Historical Use

People have a tremendous impact on watersheds. Any time you add people to the watershed, things begin to change: the size of the forest decreases; plant and wildlife species composition changes; wetlands may be drained; watercourses altered. These changes may be short-term (lasting only a few years), long-term, or even irreversible – e.g., forest practices or damming of rivers may drive sub-species of salmon and cutthroat trout to extinction.

Getting a picture of historical land use might be difficult. However, local, regional and provincial historical societies, museums and archives might hold detailed documentary information. Long-time residents might also provide anecdotes, artifacts and photographs as well as names of other old timers.

Checklist: Facts About Your Watershed

Use this checklist to document the characteristics of your watershed.

Watershed Details

Identify:

- ❑ the name of Your Watershed
- ❑ the name(s) of major river(s) and creek(s):
- ❑ how big is your part of the watershed
- ❑ key biophysical features
- ❑ key human use features (present)
- ❑ key human use features (historical)

List Key Points About Your Watershed

- ❑ **Strengths**

  natural, economic and recreational benefits that this watershed provides to your community?

- ❑ Problems

  natural (spring flooding, summer drought) or community (river contamination from feed lots, sharing of water resources during summer dry season).

- ❑ Opportunities

  possible sustainable uses of watershed resources.

- ❑ Threats

  present and upcoming factors that may threaten your watershed?

Map:

- ❑ what your local watershed looks like – select themes (e.g., wildlife habitat, present land use, etc.) and make individual maps showing the features you feel are important.

Review Your Watershed's Issues

Each watershed is unique. Use the checklist, Your Place in Your Watershed to identify the key points. These may include:

Strengths

List the benefits that your local watershed provides to its human and wildlife inhabitants.

These may include:

- ecological (clean water, salmon spawning, wildlife breeding sites, etc.)
- economic (forestry and fisheries, tourism, farming etc.)

Problems

List the problems, which may include:

- natural (spring flooding, summer drought)
- community (river contamination from feed lots, sharing of water resources during summer dry season).

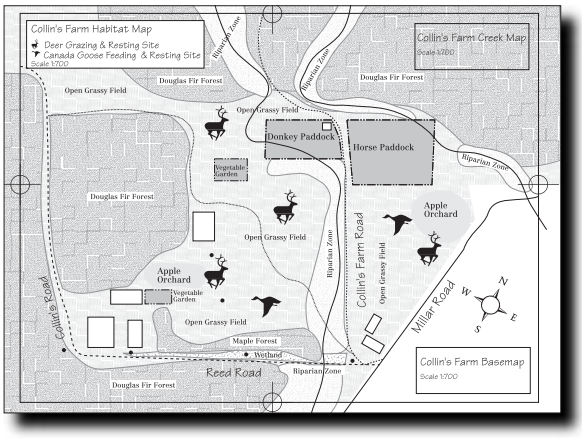
Opportunities

List the possible sustainable uses of your watershed's resources.

Threats

List the current and upcoming factors that may threaten some or all of your watershed?

Make Your Own Watershed Maps



You may decide to record and communicate the information you have gained in a series of maps. Here you can practice "bioregional mapping," a process where your group can produce maps specifically about your

watershed. A wonderful source book for local area mapping is, *Giving the Land a Voice* edited by Shelia Harrington (for this and several other useful guides, see Bioregional Mapping in the reference section at the end of this workbook).

Applying Sense of Place

The following steps will help you focus your group's resources and connect with teachers and students.

First Step: Know Your Group

When developing a collaborative watershed stewardship project with teachers and students, knowing your conservation group – its strengths and weaknesses – is as vital as knowing your watershed. New groups and even some agencies with long experience sometimes overlook making a resource inventory, but they do so at their peril for it is through such inventories that you can best design projects that are appropriate and doable. A key tool for this first stage is SWOT analysis.

SWOT Analysis

SWOT analysis is an effective way to identify your group's:

- Strengths
- Weaknesses
- Opportunities
- Threats

To carry out a SWOT analysis, consider the following questions:

Strengths:

- What are your group's advantages?
- What do you do well?

You may consider these questions from your group's point of view and from the point of view of the students and teachers you plan to assist. Be as realistic as you can. If you are having difficulty, try writing down a list of the characteristics of your watershed or group. Some of these will be strengths.

What Is Watershed Stewardship?

The concept of stewardship has been around since biblical times. Most conservationists recognize that stewardship applies to all our natural resources, including soil, water, wild lands, wildlife, crops and domestic livestock.

To many, watershed stewardship signifies a commitment to protecting the watershed for generations to come. To others, watershed stewardship is interpreted as leaving the watershed in better condition for future generations.

Natural resource conservation traditionally has focused on those species and habitats that had measurable economic value, such as salmon and forests. Concepts such as biodiversity and non-consumptive uses (e.g. nature study) have broadened the concept of natural resource conservation.

Why Be A Watershed Steward?

The motive for being a good steward is usually rooted in a person's love and respect for a landscape. A second motive is enlightened self-interest – an understanding that a healthy watershed provides us with a sustainable bounty of clean water, food, and timber. Thirdly, certain laws mandate what land management may or may not be done. The intent of these laws is to maintain biological diversity on a particular site.

Finally healthy watersheds afford a variety of enjoyable and lucrative recreation opportunities – such as fishing and hunting, wildlife viewing and white water canoeing.

Stewardship has deep roots. Like planting a tree, its rewards are not often immediate and it takes dedication, nurturing and constant care.

Checklist: Your Place In Your Watershed

Use this checklist to review your readiness to work with primary school-aged children and educators.

- ❑ List the stewardship activities you currently conduct.
- ❑ Identify where your projects(s) fit into your watershed.
- ❑ Describe the types of school involvement are you contemplating?

Profile Your Group or Agency

❑ Strengths

- What value can you bring to students? – e.g., understanding of the value of your local watershed.

❑ Weaknesses

- What might hinder work? – e.g., few members have experience working with school children.

❑ Special Opportunities to Involve School Children

- Which projects can offer students a unique opportunity to get involved in watershed stewardship? – e.g., hands-on riparian habitat enhancement.

❑ Problems and Obstacles to becoming Involved With School Children

- What could prevent your group from working with school children? Classify them as to their significance, such as:

K = key obstacle, may prevent involvement
e.g., your group is active only in summer when school is not in session

M = major obstacle, may reduce involvement
e.g., your site is too dangerous for students under Grade 8

m = minor obstacle, likely to have a simple solution
e.g., there are no rest rooms at your site - local builder can build you a set of pit-toilets

Weaknesses:

When considering weaknesses of a landscape or group, the following questions will be helpful:

- What could be improved?
- What is done badly?
- What should be avoided?

Again this should be considered from an internal and external viewpoint.

Opportunities

Opportunities are options that may come up that would help your watershed or stewardship group. Questions to consider include:

- What are the trends in public perception and interest?
- Changes in government policy related to watershed stewardship.
- Changes in social patterns, population profiles, lifestyle, etc.
- Local events

Threats

- What obstacles do you face? What trends or events could damage your watershed or prevent your group from working with students and teachers?
- Are other stewardship groups in your watershed working with schools?

Carrying out this analysis is will often be illuminating – both in terms of pointing out what needs to be done, and in putting your stewardship project(s) and potential problems into perspective.

Fitting Into Your Community Watershed's Big Picture

Not many community-based conservation projects focus on an entire watershed. Instead, they concentrate on one or more of a watershed's vital components – e.g., forest management, stream restoration, or awareness building through public and school-based programs.

There may be other groups that promote and protect other components of the same watershed. It is useful to identify the other players and list their activities. This information will help you pinpoint gaps in the stewardship of your watershed and will help you identify groups with which you may consider joint ventures.

Example

In your watershed, there may be a group promoting sustainable forestry and another group looking after your local salmon hatchery. However, no one is educating the community about the connections between sustainable forestry and fisheries. Your group may be interested and able to fill that gap, either with a separate project or in partnership with one or both of the other groups.

Other groups and agencies also can help you pinpoint your group's position in the community watershed stewardship map. For information on working in collaboration with other groups, see Module 6, Collaboration and Partners.

Checklist:

Other Groups and Agencies Active in Your Watershed

Use this checklist to develop a clear picture of what conservation and education activities are currently occurring in your watershed and to identify the players.

Other Groups and Agencies

- ❑ List agencies or groups that are active in some aspect watershed stewardship in your community.
- ❑ List each group's activities and projects.

Gaps In The Watershed Stewardship Picture

- ❑ List gaps in stewardship activities and projects.
- ❑ List gaps in education initiatives.
- ❑ Identify which gaps your group is willing and able to fill.

Your Group's Partnerships

- ❑ List all formal and informal partnerships you have with other groups and/or agencies.

Opportunities for Partnerships

- ❑ List groups and projects that your group could partner with.
- ❑ List how your group and the other(s) can work together?
  - in your community watershed's big picture?
  - formally and informally?

Checklist: What You Get From Involving Teachers and Students in Your Projects

Use this checklist to document how working with primary school aged children and educators will benefit your group.

Make a list of the following:

Community Awareness of Your Organization and Projects

- ❑ Key messages about your group and project(s) that you would like students to take home to their families and community.

Byproducts of Increased Community Awareness

- ❑ Benefits to your group that you hope to achieve through increased community awareness- e.g., increased membership or donations for specific projects or equipment.

Kid Power

- ❑ Types of work students could contribute.

Other Benefits For Your Group

- ❑ Other benefits your group will receive. (Sort all benefits in order of importance to your organization.)

Second Step: Connecting Your Project With Schools

If you are reading this booklet, you are likely considering ways to involve school children in watershed stewardship. It is important, though, to identify why and how you want to involve students and teachers? The following is a discussion of some of the key benefits.

What You Get From Involving Teachers and Students in Your Projects

Some of the potential benefits are listed below:

Community Awareness of Your Organization and Projects

Many community conservation groups work long and hard on important conservation projects with few people outside the group's volunteers and employees ever learning about the work and its value to the community. By involving students and teachers, your group can tap into a powerful communication grapevine. Many schools have newsletters and web sites through which they communicate information to students and their parents. By involving students, you will almost instantly reach the large portion of the community who have children in school.

You also can make use of the family jungle telegraph system. Here, students who participated in your program may tell their parents and siblings about the project, field trip or classroom visit, thereby generating interest in your project and your group.

Byproducts of Increased Community Awareness

Increased community awareness can have other beneficial results, including:

- Increased membership, donations and good-will
- Short-term recruitment – teacher and parents assisting or joining your group
- long-term recruitment – students becoming active supporters and members as adults

Kid Power

Many stewardship projects require work ranging from large construction projects done by professionals to smaller functions such as area clean-ups, fund raising and envelope stuffing. If your organization is looking for workers, student helpers may be an answer in some situations. You may also get the added bonus of help from teachers and parents. In most cases, however, your group will have to supply inspiration, motivation, training, supervision and perhaps tools.

Other Benefits

Developing and implementing co-operative, partnership programs with schools can help your group develop new skills – such as communicating with teachers and students and organizing and leading public programs. A successful school partnership can also provide a model for tackling other programs.

What You Can Give Students and Teachers

Depending on your group and the projects that you are involved in, you can provide numerous benefits to students and teachers, including:

Information

Information about watersheds and watershed stewardship is invaluable to you community and its schools children. This information will help create awareness, appreciation and understanding of the following:

- Natural resources in the community
- Watershed stewardship, in your community and in general
- Your organization, its goals, objectives and the services it provides to the community
- Your project including its value, and how it fits into the big picture of stewardship of your community watershed

Skills

Many groups and organizations working with children concentrate on delivering information, overlooking the importance of giving students the opportunity to learn skills through hands-on experience and practice. These skills may be:

- Physical, such as techniques and approaches used in watershed assessment and restoration.
- Critical thinking that helps students make informed decisions about their watershed.

Inspiration

In some cases, sharing your successes may instill in students a deeper commitment to environmental action and, perhaps, a life long interest in watershed stewardship. Your project may involve an awesome landscape or natural feature, a captivating ambassador species or an inspiring person who can grab the attention and imagination of students. Other opportunities for inspiration include:

- An opportunity to see people in their own community modeling good practice in

Checklist: What Your Group Can Give Students and Teachers

List what you can do in the following categories:

Provide Information

- ❑ about watershed stewardship in general
- ❑ about your community watershed in particular
- ❑ about your organization
- ❑ about your project(s)
- ❑ about natural resources in your watershed

Watershed Stewardship Skills:

- ❑ physical skills
- ❑ critical thinking skills

Inspiration

- ❑ landscapes and physical features
- ❑ ambassador species (interesting plants and animals)
- ❑ inspiring people active in conservation in your community

community conservation.
- An opportunity to work with adults on real conservation projects.

Projects You May Consider

A key early decision you will have to make is what kind of project will you present to students and teachers. The following are brief descriptions of major types of programs.

School Visits

A school visit requires that one or more members of your group visiting students in their classroom or on the school site. The purpose may be to convey information about your group and project or it may be to educate students about watershed stewardship issues, in which case it could instructions on developing skills for stewardship actions.

The school visit may entail one or more of the following:

Your group's delegation may offer Simple Presentations to a single class, several classes or an entire school assembly. This might be an introduction of your group and its projects or it may be a formal preparation for a student visit to your site to observe or participate in your project. Here, the presenter acts as a resource person who supplies information and answers questions from students and teachers. An example may be the presentation of a slide show about a local fish hatchery.

Complex Presentations may involve one or more members of your group or a professionals presenting to a single class, several classes or an entire school assembly. The topic will likely be similar to those of simple presentations but may include drama, puppets, songs etc. to capture student attention, communicate information, demonstrate skills or inspire positive watershed actions and attitudes. An example might be a play or puppet show about the conversion of a child from indifference to his/her watershed into a watershed protector.

Demonstrations occur where a presenter shows students an object animal, process or procedure that is key to your project. The presenter may provide information and answers questions or she/he may demonstrate skills that students may apply to a project. For example, a presenter might bring an aquarium containing aquatic creatures from a lake or stream in your watershed, naming and describing the life histories of each creature (information) and/or demonstrating the techniques for observing and describing the creatures (skill).

Student Activities occur where a presenter facilitates student action in a simulation or real-life situation. Here the presenter provides information and helps students develop new skills. An example could be a presenter helping students learn about basic mapping through creating a map of their classroom or schoolyard.

Student Projects arising from a group visit involve the presentation of ideas, materials and advice to help students and teachers set up and run projects over a short or long term. For example, students might monitor the growth and development of salmon eggs, smolts and fry in a classroom for a part of the school year.

Hands-on Projects

The next step up from simple school visits will usually involve students assisting you on your watershed stewardship projects.

They might, for example, help with site restoration or the rearing and release of fish from a hatchery. As with field studies, these may be short- or long-term projects. Some examples include:

- Short-term Projects
  - a one-time clean-up of a section of a stream
  - a planting bee of native riparian vegetation at a disturbed point in your watershed
- Long-term Projects
  - students commit to keeping a section of a stream bed and adjacent riparian habitat clear of litter for the school year

Field Studies

Field studies generally involve education activities on-site. This could include monitoring physical and ecological components of a section of a stream. Almost all field projects include some level of hands-on student involvement rather than a simple streamside lecture. Examples include:

- Short-term Projects
  - A one-time study of part of the watershed's story – e.g., a census of invertebrates at one stretch of a salmon stream
- Long-term Projects
  - A study of part of the watershed's story throughout the school year – e.g., a census of invertebrates at one stretch of a salmon stream consisting of samples taken at two-month intervals
  - A series of observations and/or activities repeated or sequenced at specific grade levels (This could cover Grades K-12, but it is often more practical to span the grades in a single school - e.g., primary, middle or secondary

Third Step: Fitting Your Project Into a Teacher's Schedule

Working with teachers can be challenging. They are often hard to contact because they are in class, away from a telephone, for much of their working day. Field trips and classroom visits must fit into a rigid school schedule. Also, budget cuts have reduced the number of field trips any class can afford to take. Finally, you may be competing with several other community organizations that are tempting teachers with attractive education/outreach programs.

Before you initiate contact with your local schools, it may be wise to learn about your school's situation. Some key aspects are discussed below.

Before You Contact a Teacher Know What Classes Are Learning

Curriculum Guides

BC's Ministry of Education has produced a set of curriculum guides called Integrated Resource Packages (IRPs) for each grade level and area of study. These documents identify learning outcomes – what students should be learning at each grade level – and guide teacher activity throughout the school year. IRPs are available free on the Ministry's web site www.bced.gov.bc.ca/irp/ (See the sidebar: Accessing Curriculum Connections).

Know Class Structure

There are several aspects of class structure and school policy that conservation groups should know when planning co-operative programs. Several key components are discussed below.

Class Size

At the time of writing, most classes contain between 25 and 35 students. These is a manageable-sized groups for one or two experienced presenters to lead but inexperienced volunteers may find such number challenging.

Also, schools often want to send more than

Accessing Curriculum Connections

Learning outcomes include both information such as the names of common salmon found in British Columbia and skills such as critical thinking (logical ways to assess the relative value of information and its sources). An example of an "outcome" might be as follows: After participating in an activity, students will be able to identify three types of aquatic insect that indicate a stream's water is clean and low in organic pollutants.

Appendix 1: A Matrix of Curriculum Connections identifies the connections that you can make between public school curriculum and your watershed stewardship projects.

Also, the BC Habitat Conservation Trust Fund web site lists curriculum connections for conservation/stewardship projects for science, math, social studies, language arts, etc. for Grades K-7. Try accessing the HCTF site map page (www.elp.gov.bc.ca/hctf/sitemap.htm). Scroll through the listings to find web pages such as, Grade 4 Curriculum Connections: Science

These matrices are rather complex. You may wish to work with a teacher in your community to learn how to use them.

one class (usually two) on field trips to share the cost of a bus. Many groups design their programs to accommodate visits by students in busloads.

If the class uses car-pooling, expect extra parents and volunteer drivers and perhaps some younger siblings, as well.

Class sizes vary between grades and may fluctuate as ministry policy changes. The best way to ensure that you are planning for the correct class size is to check with your local principal each year.

Special Needs Students

Many school boards now integrate mentally and physically challenged students into regular classes. Program leaders can expect that some students in visiting classes will have some level of physical, learning or emotional challenges. When booking a class visit, it is wise to ask if there are any special needs students in the class. If the answer is yes, discuss the ways of integrating and including all students.

Class Rotations

By the time students reach secondary school, most classes are integrated into a rotation system. Here, the day is divided into four to six periods. At the end of each period, students move with their classes to another classroom where they are taught specific subject such as mathematics, biology, music, etc. Since it is very difficult to alter rotation schedules, most education presenters find that it is difficult to interest teachers of Grades 8 and higher in a half or whole day field trips.

Semesters/Terms, Exams and Holidays

The school year is divided into several segments called semesters or terms. Depending on the school and grade level, students may have a set of exams followed by a holiday at the end of each term. Most teachers and students will be fully occupied at the beginning of term settling into teaching routines and at the end of term preparing for and writing exams.

When planning for school programs and class visits, it is important to know about

the timing of school holidays. This will prevent you from arranging activities and organizing volunteers and equipment when students are unavailable. It is equally important to avoid planning programs immediately before major school holidays such as Christmas, Spring Break and Summer Vacation. At these times, students are often excited and preoccupied. Many agencies do not book school programs during the week before important holidays and two weeks before summer vacation.

For information about the timing of school holidays contact your local school board.

Professional Development Days

Each year, teachers take several days from their heavy teaching schedule for training in new teaching techniques or technology. Schools are closed and students spend the day at daycare or with their parents. As each school district may have set aside different Professional Development (PD) days, you should contact your local school board for information.

Contacting Teachers

For almost any co-operative program, your group must make direct contact with teachers.

Initial Contact

Most schools prefer that initial contact be made through the board superintendent followed by the principal, who will assess the request and pass it on to the relevant teachers or to the school's science head or field trip liaison. If interested in your program, the superintendent can release teachers and funding to work with you on your project.

Methods For Making First Contact

Telephone
Telephone is still the most popular method of contacting schools. However, teachers may be available only at non-teaching times, before and after classes, at lunch break and during recess.

Mail
Sending a mail-out to schools is another effective means of contact. However, large mail-outs are expensive. And in any case, the school's superintendent still should be informed beforehand to ensure that she/he is aware of your program.

Facsimiles
Many groups that work with teachers find faxes effective in informing teachers about new programs and partnership opportunities. Faxes can be sent and received at any time, avoiding frustrating episodes of telephone tag, and school fax numbers are listed in your telephone directory.

As with mail-outs, however, you should confirm your district's policy on accepting faxes beforehand.

Email
Email also can promote your program directly to teachers. Some schools have their own web pages, including hot buttons that let you email them directly. However, email addresses for schools and teachers may be hard to locate. And once again, check with the district or school principal before you send email.

School Visit
At some point, you may want or need to make a personal visit to present your proposal for co-operative work to one or more teachers. In face-to-face discussions, you will get immediate feedback about your proposal. Remember, though, teachers are busy. Phone ahead to make an appointment.

PD Days
Many school districts have large conventions and workshops during Professional Development days. Here, your group may have the opportunity to address a large number of teachers using displays, printed information and face-to-face conversations.

Teacher Contact Checklist

When making an initial school contact, have a simple plan of action.

Decide who in your group will contact the school.

Develop a communication plan including the following:

- Identify yourself and your group

❑ Give a short description of your group

❑ Outline your project

❑ Discuss ways the class can be involved

❑ Explain why they are being contacted

❑ Outline any other ways that students could collaborate with your group

Make contact in the following order:

❑ superintendent of schools

— introduce yourself, your group and your project
— seek permission to contact principals and teachers
— ask for recommendations on best means to contact teachers - e.g., fax, phone etc.

❑ school principal

— introduce yourself, your group and your project
— ask for recommendations on teachers to contact

❑ individual teachers

— introduce yourself, your group and your project

Decide on the methods for making initial contact (check one or more)

❑ telephone ❑ mail

❑ faxes ❑ email

❑ school visit ❑ PD days

Decide when you will contact teachers?

❑ in the school year

❑ in the week

❑ in the day

Good Times To Contact Teachers

Good Times in the School Year

Teachers usually spend the first few weeks of the school year, term or semester organizing students and their teaching schedule. During this time, they may be too busy with day-to-day tasks to assess your stewardship project. However, most teachers prefer to have their planning completed within the first months of term so that they can book buses, organize parent helpers and commit funds for the term. Many organizations and agencies wait one or two weeks after the start of school before contacting teachers about booking field trips or class visits.

Good Times in the Week

Good times in the week to contact teachers are often mid-week, Tuesday through Thursday.

Good Times in the Day

The best times to contact teachers are when students are not in class – morning before 9 a.m. or at recess, lunch break, afternoons at recess or after 3 p.m. Start, stop and recess times vary from school to school. It is best to call ahead and confirm the school schedule before you try to contact a teacher directly.

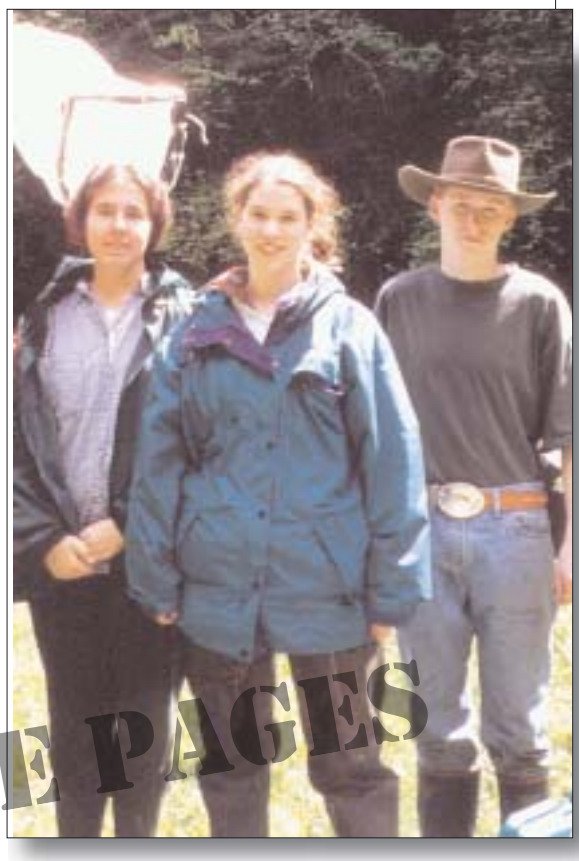
Module 2: Who Are These Students Anyway?

Pre-Test

Do you already have the knowledge covered in this module? Test yourself with the following questions. Check yes or no for each question. If all your answers are yes, you should move to the next module. If one or more of your answers are no, it may be useful to read through this module.

Can you:	Yes	No
11. Define three common learning styles and discuss how they will affect your teaching?	❑	❑
2. Identify the general cognitive, physical, and emotional development of students from Kindergarten to Grade 12 and describe their implications for education and conservation activities?	❑	❑
3. Define a participant analysis and explain how it can be used?	❑	❑
4. Conduct a participant analysis of the school or community groups with which you plan to work?	❑	❑

Deborah's Dilemma



Deborah is a member of the Killarney Creek Society on Bowen Island, located near West Vancouver's Horseshoe Bay. The island, being close to Vancouver, has been under heavy development pressure for the last 10 years and the society has been working to conserve the Killarney Creek watershed. The society's board has decided to try to include students in their stewardship projects, which include stream clean-ups, planting of streamside vegetation to reduce erosion, and monitoring of water quality. Board members believe that by including students, they will increase community awareness of local watershed issues and help develop a stewardship ethic in the next generation of Bowen Islanders.

Deborah has volunteered to lead a committee to develop a program that will include students from the local primary school in some of the society's projects.

At first Deborah is apprehensive. It's been quite a few years since her own children were in primary school; her youngest is now 24. She is hazy as to what children know and can do at different grade levels. She visits the community library and with the help of Ross, the librarian, she reviews information on how children learn. Ross also suggests that she look at a number of articles for teachers and parents on Ages and Stages – the physical, mental, and social development of children as they grow up.

Deborah finds this research fascinating. The information seems sensible and she can see many applications for effectively working with students.

This module is a summary of information that Deborah is likely to have uncovered in her research.

What Stays In Your Brain

In general research has shown that people remember:

10 percent of what they hear
30 percent of what they read
50 percent of what they see
80 percent of what they do.
90 percent of what they teach others

Implications

Effective communication with school children should involve activities, pictures, and images as well as written and spoken words.

Developing An Effective Program

One of the greatest challenges for non-teachers who lead groups of students is to find effective ways to guide activities and present information effectively so that students are interested, engaged, and well behaved. Many volunteers find working with students frustrating, especially after toughing out a session with a wild or unresponsive group. Effective teaching is a demanding task for which teachers receive years of training. However, many non-teacher volunteers and staff from nature centres and conservancy groups regularly lead classes of school children through successful, effective programs and activities. How do they do it?

Understanding of students is key to their success. Knowing where students are in their intellectual, physical and emotional development provides leaders with the background to choose appropriate activities, and to present information using suitable language and presentation techniques.

Learning Styles: How Children Learn

Think about what you do when you are learning something new. Probably you approach leaning tasks in a similar way each time. Over time, you have developed a behaviour pattern that you use for learning. This pattern is called a learning style.

Of course, we don't approach every learning task in exactly the same way. However, we develop a set of behaviors that we are most comfortable with – our preferred learning style.

There are many ways to name learning styles. Behaviour scientists have developed numerous learning theories and models. This workbook will describe only one model, the Visual, Auditory, Kinesthetic model (See References: How Students Learn and Learning Models).

The Visual, Auditory, Kinesthetic Learning Model

In this model, learning can be divided into three styles. Learners in each category learn best under certain conditions.

Visual Learners

Students in this category learn best by taking in new information through seeing real objects, plants, animals and landscapes. They also learn well from pictures, diagrams, and charts. They like to reinforce learning by drawing, and sketching.

Studies have shown that more than 50 per cent of the people in western cultures have strong visual learning tendencies. Thus, whenever possible, leaders should include visual aides when making presentations or instructing students. For example if you are explaining how to build a birdhouse, bring the building materials and tools and demonstrate the technique. For situations where you can't show students the real object, organism or landscape, use a large picture.

Auditory Learners

Auditory learners take in information through the spoken word. This type of learner often reinforces learning by repeating what is said to them, and discussing observations with the leader and other students. Studies show that this is a much smaller group than visual learners.

Do not deliver information and instruction in verbal form only. This may be easy and inexpensive but it will be the least effective technique (see sidebar: What Stays in Your Brain). Instead, include pictures and activities in any presentation. If your situation offers no alternative to auditory instruction, make sure that the presentation is broken into short sections, separated by related activities or rest breaks.

Kinesthetic Learners

These are the hands-on learners who take in new information through active physical involvement, including touching and building or manipulating tools and models.

This type of learner often reinforces learning by physical repetition and model making.

All students, especially younger ones, love to touch and manipulate objects. Keep this in mind if you intend to use delicate materials and tools as props or in demonstrations. You may decide to keep such materials out of reach or protected in plastic or glass cases. But work hard to give kinesthetic learners the opportunity to touch objects. One nature centre that provides a program about beavers living in an adjacent pond shows students a display mounted beaver in a glass case but also passes around several beaver pelts for children to touch and pet.

Implications for Working with Students

The purpose of examining learning styles is to get to know how to communicate and hold the interest of students.

The best learning takes place when you are addressing all three learning styles – e.g., showing students objects and landscapes, and offering opportunities to touch things

and perform physical tasks, as well as talking and giving an opportunity to ask questions and make comments. By doing this you will ensure that you reach and hold the attention of the largest number of students.

Although each student may dominate in one style, she or he will take advantage of others as well. All students will respond better to a varied presentation than to a single approach.

Ages and Stages:

Matching Your Program and Activities to Student's Brains and Bodies

Children from Kindergarten to Grade 12 are undergoing huge changes as their brains, bodies and social skills develop. Often with each year, a child undergoes major changes in abilities to:

- move her or his body
- manipulate tools and objects
- understand
- concentrate
- take instructions
- communicate
- work together in groups

When group leaders are tuned into the interests and abilities of the children they lead, they can provide stimulating and effective activities that fit the needs of teachers and students.

The Ages and Stages sidebar was developed from a number of sources listed in under How Students Learn in the References and from the two authors' 30 years of experience working with students in environmental education programs. The table lists key aspects of students physical, cognitive and social development. Also included are some key implications these ages and stages have for your student activities and teaching. You can use the table to guide the development of new programs and to help review and improve existing programs.

Pre-school to Kindergarten (ages 2-5)					
Physical Development	Cognitive Development	Socialization	Relationship with Adults	Activity Implications	Education Implications
• very active • little stamina, tire easily • fine motor skills and co-ordination is not yet well developed • very limited bladder and bowl capacity, access to on-site washrooms necessary	• can be very curious • very short attention span • have difficulty understanding verbal instructions • learn primarily through use of the five senses • beginning to understand simple cause – effect relationships • can ask and answer simple *what* and *why* questions • still developing memory and language skills • like learning new words • enjoy story telling • can confuse fact and fantasy	• self-centered • find sharing difficult • relationships are based on one-on-one interactions • individuals are unable to work in a co-ordinated groups	• relationships are centred on parents, and care givers	• work in short, simple activities and tasks (5-10 minutes), avoid long projects • concentrate on simple discovery activities using the five senses – e.g., finding the sunniest (warmest) or shadiest (coolest) place in the forest • instructions are best done as demonstrations rather than just verbally, do not give written instructions • give each child the same task, avoid cooperative group work • if using simple equipment (e.g., hand magnifiers) make sure there is one for each child	• information must be relevant to the child's experiences –e.g., express water volumes in bathtub units instead of cubic metres • stories are useful for holding attention and forming a bridge between a child's world and your site • use simple language • make student's experience fun

Grades 1-3 (ages 6-8)

Physical Development	Cognitive Development	Socialization	Relationship with Adults	Activity Implications	Education Implications
• very active • more stamina than 2-5 year-old, but still tire easily • better co-ordination and fine motor skills but still developing • access to on-site washrooms necessary even for short visits	• display a wide variety of skills and abilities • can be very curious • short but increasing attention span • most learn best by doing (active learning) • like to explore the world using the five senses • limited concept of time • have difficulty recognizing that objects may have several properties • still have limited verbal communication skills • enjoy role playing • need immediate results • like to exchange ideas and stories with others • beginning to deduce simple cause – effect relationships, but may be inconsistent • love to answer question but may be off topic stories e.g., "My dog is sick" • enjoy reading and listening to stories • like to make collections of natural objects	• developing strong social relationships among peers (best friends) • can recognize the mood of speakers • are developing a rudimentary moral sense based on personal concepts of right and wrong • are still seeking out identification and clarification of their roles as individuals	• beginning independence from home • many very eager to please	• large, simple tools can be used • use stories to communicate information and instructions • activities must be short (10-20 minutes) • activities and projects should show immediate results • role playing activities will help students build empathy for your project • instructions are best done as demonstrations rather than just verbally or written • leaders' presentations should stress share and do rather than show and tell • group oriented activities can work well • orient activities to the present and to objects that can be watched, touched, heard, smelt or tasted. • students love take-away objects as mementos of their visit, encourage non-consumptive collection (bark rubbings, photographs) or hand out participation certificates	• leaders must show great care about the moods and attitudes you display to students - they can read you like a book • two direction communication between leader and students is needed (speak *and* listen) • questions should generate action rather than just answers • concepts involving relationships should be simple and carefully presented • stress verbal and action as means for students to share their experiences • avoid complex value decisions • encourage personal relationships of students with plants, animals, and landscapes – encourage both feelings and understanding and knowledge • encourage children to use art (drawings, songs etc.) to give you feedback on the effects of your program