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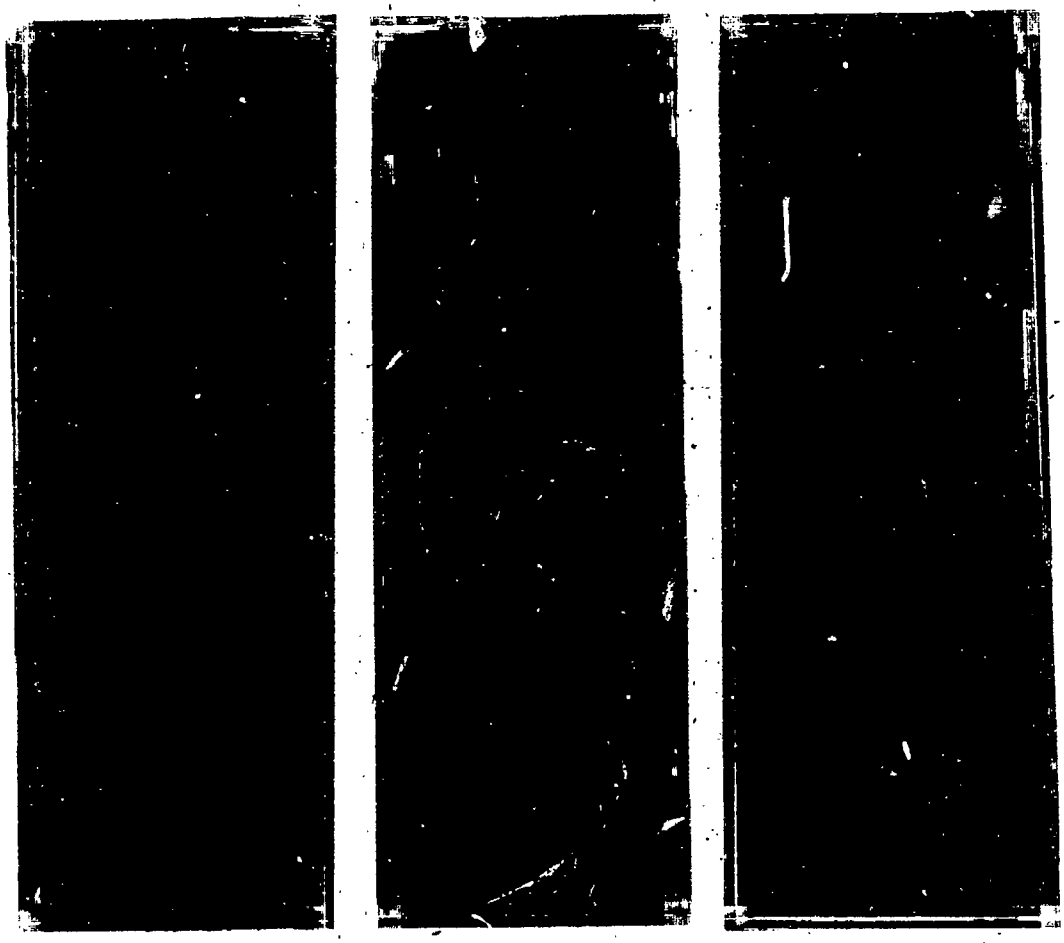
ABSTRACT

Almost every school in the United States has natural areas nearby that are often overlooked as learning sites. The intent of this document is to provide educators with a platform to begin natural resource programming at sites near their school. Philosophical as well as concrete information is outlined to provide both intrinsic and conceptual connections to natural resource areas. This document is divided into five parts. Part 1, "Connecting Students to Natural Resource Areas," outlines the effectiveness of such programs. Part 2, "Getting Started," includes sites and site selection, planning and proposal writing, project plan outlines, changing attitudes and structures, changing teacher roles, changing educational models, and the time issue. Part 3, "Program Strategies," includes creating an identity, increasing community contact, creating student leadership, spending some time on aesthetics, approaching resource people, funding ideas, field techniques, Earth ethics and etiquette, and project ideas. Part 4, "Models," includes four different models of programming based on a nearby natural resource area. Part 5 outlines some closing thoughts. A list of federal agencies, private/nonprofit organizations, State agencies, local agencies, and political and industrial contacts are included in the appendix. (JRH)

Watersheds, Wetlands, Forests, Streams

ED 395 800



Learning Opportunities Next Door
Linking Schools with Natural Resource Areas

Watersheds, Wetlands, Forests, Streams

Learning Opportunities Next Door

Linking Schools with Natural Resource Areas

Impetus for this publication came from Jackson Bottom Wetlands Preserve, supported by funds provided by the Governor's Watershed Enhancement Board, through the Oregon State Lottery and Environmental Protection Agency.

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Illustration and layout by Bitar Designs

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About The Governor's Watershed Enhancement Board (GWEB)

The Oregon Legislature created the Governor's Watershed Enhancement Board and the enhancement program to promote public awareness about the need for restoring the natural resources of watersheds. GWEB provides technical assistance and grants for projects which focus on improving streams, upland watershed areas and educational programs on the benefits of healthy watersheds. The Board encourages individuals, communities and organizations to join together to improve local streams, watersheds and water quality.

About Jackson Bottom Wetlands Preserve

Jackson Bottom Wetlands Preserve is 650 acres of low-lying floodplain along the Tualatin River. Since 1979 the Jackson Bottom Steering Committee has been working together to transform these once degraded wetlands into a wildlife and water quality "living laboratory." The Steering Committee, made up of a unique alliance of economic interests, environmental groups and public agencies focuses its efforts on five major goals for the preserve. Jackson Bottom's Steering Committee works to increase the diversity of resident and transient wildlife, improve water quality, provide research, educational experiences and to offer passive and non-consumptive forms of recreation.

About The Watersheds and Wetlands Awareness Program

Much of what appears in this manual was learned as we piloted "The Watersheds and Wetlands Awareness Program." The program was designed and implemented by Jackson Bottom staff with funding through GWEB. The program took place in four schools in the Tualatin Basin of western Oregon. There were two participating classrooms at each school. Jackson Bottom staff acted as guides and facilitators as the students and teachers progressed through an individualized, site-based program. Our goal was to begin a program that belonged to the school and that would continue to function in the future independent of our assistance. The schools involved would then become models for others who wished to start similar programming.

"Teach ecology early on. Let it be understood that the earth's life is a system of interliving, interdependent creatures, and that we do not understand at all how it works. The earth's environment, from the range of atmospheric gases to the chemical constituents of the oceans, have been held in an almost unbelievably improbable state of regulated balance since life began, and the regulation of stability and balance is accomplished solely by the life itself, like the internal environment of an immense organism, and we do not know how that one works, even less what it means. Teach that."

Lewis Thomas

INTRODUCTION

What's this manual all about?

Almost every school in our country has a natural area very nearby. It could be that marshy place behind the school, the little stream or "ditch", the unmowed field, or the patch of woods beside the parking lot. These natural areas are often overlooked as learning sites; or if they are recognized, they are not acted upon because we do not know exactly how to start using them.

The intent of this document is to provide educators with a platform to begin natural resource programming at sites near their school. Philosophical as well as concrete information is shared to provide both intrinsic and conceptual connections for students and educators to natural resource areas. It is intended to offer support, ideas, encouragement and new ways to think about what we do as educators. It is meant to inspire you and move you to action

It is our hope that through programs that link schools with natural resource areas, citizen awareness and action will increase. The vision is for schools to become vital resources for their communities and that students, through real world projects, become active participants in their society.

"In speaking with children who might one day take a permanent interest in natural history- as writers, as scientists, as filmmakers, as anthropologists- I have sensed that an extrapolation from a single fragment of the whole is the most invigorating experience I can share with them. I think children know that nearly anyone can learn the names of things; the impression made on them at this level is fleeting. What takes a lifetime to learn, they comprehend, is the existence and substance of myriad relationships: it is these relationships, not the things themselves, that ultimately hold the human imagination."

Barry Lopez

Part 1:

CONNECTING STUDENTS TO NATURAL RESOURCE AREAS: WHY IT WORKS!

One of the best reasons for implementing a program of this style is that IT WORKS. A strong connection to the larger world community starts with an intimate local understanding. Children can apply knowledge of systems and concepts learned in a personal experiential world to global problems. Once they grasp the value and function of the forest, wetland, grassland or watershed in their school backyard, it is a short step to awareness about other watersheds or wetlands that they see in their own community, or to a concern about global environmental issues they hear about in the media. A personal stake in the lives of their wood ducks, red-tailed hawks or metamorphosing moths becomes an intrinsic understanding of the richness present in all ecosystems. A program such as this taps the innate desire of children to care for their world and allows them to do just that: to help, to clean up, to make better homes for wildlife, to gather information to guide decision making. It empowers them at the local level and gives us all a much needed assurance that active informed citizens can and DO make a difference.

Students involved in active hands on programs also feel better about the way they are learning. The students report that they have more fun and feel like they are learning things that they didn't know before. Teachers say that the students really retain the things they learn and can apply the learning in other situations. And again it is a training ground for citizen action.

In these times of being overwhelmed by environmental problems on every front, it is easy for people to lose their sense of hope and to feel defeated in the face of such looming concerns. This can be especially hard on young people, who have been inundated since early childhood with the magnitude of our planet's problems. Working with young people in settings where they can impact an area in a positive way is a powerful tool to help them realize the healing potential they have as caring human animals.

C.J.'s Evaluation

During the course of our program year we took quarterly student evaluations of the Watersheds and Wetlands Awareness Program. C.J.'s evaluation is representative of many of the student repsonses. The enthusiasum and eagerness of the students to be involved with their environment never flagged.

C.J.

GWEB
WATERSHEDS AND WETLANDS AWARENESS PROGRAM
STUDENT EVALUATION 2ND QUARTER

1. What has been the thing you liked best about your wetlands/watershed program?

What I liked best about this program is that it is adventurous. You learn about animals, plants and places you have not even heard of. I didn't know what a muskrat or our marsh until you came here. that we have done.'

2. What has been the thing that you liked the least about the wetlands/watershed program? I think I don't not like anything

3. Would you be interested in participating in this kind of program again next year? Yes, I would like to because of all of the exciting stuff.'

4. In your spare time do you ever visit or think about your wetland or watershed site?

Yes, I do think about the wetland. Come to think about it I sometimes even dream about the Montclair Wetlands.

5. How was this program different from your regular school program?

It is different because inside we work with sheets on desks but outside we deal with mud, animals, population, etc. It can go on and on and on.

"When human beings attempt to understand the relationships between themselves and the other elements of the environment, when they think creatively and critically about those connections, when they actively seek to find the truth about those interactions and try to anticipate the consequences of certain behaviors and the range of options available, they are directing attention at the environment in an educated way. When teachers promote consideration of this sort they are fostering education about the environment."

Milton McClaren

Part 2:
GETTING STARTED

Many educators find the idea of starting a program such as this to be intimidating... And it can be!! Teachers already have heavy work loads. It often feels as though there isn't enough time in the day to prepare for classes, grade the day's papers and still get to eat your lunch! The extra work required to implement an on-going, in the field program can indeed loom large in the picture and cause many people to give up before they even begin. But take heart...it can be done and is being done by people just like you.

This section of the manual is meant to help you focus on the nuts and bolts of the beginning process. It will help you to ask yourself important questions and sharpen your ideas. It will help you to develop a proposal that you and your students can use to gain support for your projects.

Sites and Site Selection

The initial step is to find a site around which to center your program. The site is an integral part of the program because it becomes the focus. Because of time limitations in our schools, the closer the site is to the school door the better. The site doesn't need to be huge or elaborate. It can be the little ditch on the school grounds back behind the cafeteria, it could be the marsh on private land across the street, it could be the little patch of forest left in an urban development, it could even be something that you restore or develop on your own school grounds. The ability to visit the site frequently outweighs any lack of "wildness." In the reality of today's shrinking school budgets, transportation money is drying up. A site within walking distance solves this problem and makes all logistics easier.

After you determine what site or sites you may be able to use for your program you will need to find out as much as possible about the site. In an ideal situation, this entire process can be done with the aid of your students. You will want to find out who owns the property. Who is in charge of managing it? Can you use the site as a study center? Are there special things about the site? Is it a protected area? How will you minimize the impact of your students presence at the site? Get maps of the local area. Talk to homeowners associations and neighborhood businesses. Can you do enhancement work there? How could the site be improved for wildlife or educational uses? What kind of information would it be useful to have about the site? Who might best use that information? What is the history of the site? Any cultural values?

When you find out who is involved with your site you may be surprised to learn that those people need your student staff to collect information as much as you need them for their expertise. Some sites may be in private ownership and you may have to seek permission to use the land as a study site. This process in itself can be quite a learning experience for your students.

Many schools are lucky enough to have natural areas on their own grounds, but you may still need permits to make changes. Each place has its own unique combination of political circumstances just as each place has its own unique natural character. *Let the problems you encounter become learning challenges. Help your students learn about how the world outside the classroom operates. The problems you face will lead to the development of valuable life and study skills.*

Willingness to Change Attitudes and Structures

Often the success of innovative programs depends on our ability to think in new ways. Change is never easy and is especially hard to create in institutional settings. It is difficult to envision new roles for ourselves and new shapes for our old models. With the momentum for educational change coming from the state level, the atmosphere for programs of this type is good, and you could be on the leading edge of this change. The watchword of the hour is flexibility.

Changing Teacher Roles

In this kind of program the teachers may have to recreate the way they interact not only with their students but also with their peers and administrators. You may find yourself much more of a coordinator and facilitator than a deliverer of set curriculum.

You may find that the most important function you can serve is finding access for your students to partnership opportunities with other adult instructors. You may spend your time locating project ideas, equipment and funds rather than directly teaching lessons. You may need to spend time on the phone coordinating an event or writing proposals to fund your program's newsletter. It is not the role you are probably most familiar with and it can seem like a leap into the unknown. It can also lead to personal growth and a great deal of fulfillment as your program blossoms. Being ready with a detailed proposal in hand can go a long way in justifying why your time should be spent in this new way.

Changing Educational Models

Everyone involved in education agrees that our current model doesn't seem to be working. Students are not entering the adult world prepared to meet the challenges of a rapidly changing and complex world. Demand for people who can work

cooperatively, be self motivated learners and understand complex systems is growing in every field of endeavor. Schools somehow need to provide their students with opportunities to learn the skills of citizen action, exposing them to processes and systems both natural and social. Students need to have real world experiences with real world consequences. Programs such as these can offer those opportunities. Schools could be in the business of finding community needs that aren't being met. Schools could become a resource for the community instead of being viewed as a drain on resources. The school, through a program, could provide opportunities for students to interact with their community and society using meaningful projects that need to be accomplished. A great deal of excitement and motivation builds around an idea when students are producing work for a real world audience with a real world purpose. Think of the schools as a pool of highly educated leaders with a large motivated work force that just needs to be focused and applied to the needs of the community!

The Time Issue

Time, or really the feeling of never having enough time, is a stumbling block in the initiation of programs. How much time should be allocated for activities related to the project? How will the teachers involved find time to organize materials, field work and special events? Is one day each month enough field contact? How will this program fit in with music, social studies or math? Is a 45 minute period enough time to get out into the field, do a study, and then get back? All these time questions are quite valid and need to be explored. But our attitudes, those hidden assumptions behind our time feelings also need to be explored. How did our school day come to be fragmented into 40-45 minute blocks? Does it have to be that way? Can our scheduling be more flexible without a loss of quality?

Using a thematic approach to interweave your natural resource site into several subject areas can increase the amount of time spent studying the site. Math can serve to interpret collected field data. Art could be the designing of logos or signs for the site. Music could involve songs written about the area and performed at a school wide celebration. Pursuing permission to have use of a site, or to make changes at a site, could serve as lessons in political science. Keeping journals or producing an informative newsletter is a natural for writing and language.

You Don't Need to be an Expert

A general fear many educators experience is that they will be asked about something they don't know!! When beginning a program that involves a natural resource area there will be tons of things you don't know, and that will be part of the excitement. As teachers we have the feeling that we should always be able to answer every question like an expert; but we may want to consider that the "teacher-as-learner" may be a more powerful model than the "teacher-as-dispenser-of-all-knowledge". Being able (and willing) to say, "I don't know, but let's see if we can find out," is a virtue in an educator, not a sin. Think of the program as an opportunity for you and your students to learn about an ecosystem together. Curiosity, enthusiasm and access to good reference materials are far more important than teachers having all the specific information on a particular environment locked away in their brain.

Planning and Proposal Writing

Perhaps the most important part of beginning a program is the time spent in the original planning phase. If you take the time to examine your hopes and limitations, to determine what your goals are and to commit those to paper you will have come a very long way toward establishing something concrete to build the program on.

The proposal form included in this section will help you to create a document you can use to approach your administrator, fellow staff members and potential partners. It will help you clarify your group's goals and priorities and could even be used to begin a grant application for funding possibilities.

Having the support of your administrator may allow you to arrange for time to do planning for and coordination of your program. With good administrative support, substitute time may be possible for planning, attending development classes or for special field trips for your students. It is almost impossible for teachers to teach a regular load and to just add on a program of this magnitude. Realistically the teacher who takes on a project of this sort will need time and support from their school. Your formal proposal may give your administrator a powerful tool for aquiring a commitment from your school board or district for that extra time you will need.

Proposal/Project Plan Samples

On the following pages you will find a proposal/project plan outline form. This general outline will guide you and your students as you begin your own project. Included in this section are two completed examples using the same format. They are from real sites in the region. Whether your project is simple or quite complex, you and your group will benefit from taking the time to ask yourselves the questions contained in the form.

Project Plan Outline

Name of Site or Study Center

Project Plan

Name: _____ Location: _____

General Overview

Project Title: _____

Mission Statement/Goals for the program: _____

_____

_____

_____

_____

Specific Educational Objectives: _____

_____

_____

_____

_____

Site Information

Name and Location: _____

_____

Brief Site Description: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Program Specifics

Current Leadership or Director: _____

Expected Partners: _____

Expected Audience: _____

Your Expected Role: _____

Expected Steps in Meeting Program Goals and Objectives: _____

Specific Needs (ideas, information, equipment, ect.): _____

Expected Outcomes (be as specific as possible): _____

Plan for Protecting the Natural Resource: _____

Timeline for Expected Outcomes: _____

Coastal Wetlands Institute for Educators

Tentative Wetland Project Plan

Name: CHERYL ROBABECK-SILER Location: CAPE MEARES LAKE

General Overview

Project Title: LINKING CAPE MEARES WETLANDS AND EDUCATION

Mission Statement/Goal for the Project: TO INCREASE AWA[illegible]SS AND WETLANDS STEWARDSHIP OF SEL[illegible]D HIGH SCHOOL STUDENTS THROUGH MONITORIN[illegible] WILDLIFE, VEGETATION, AND HYDROLOGY [illegible]F LOC[illegible] WETLANDS ECOSYSTEMS.

Specific Education Objectives: THE ABOVE [illegible]LL ACHIEVED BY DEVELOPING THE STUD[illegible]S [illegible]RVATIONAL SKILLS, THEIR ABILITY TO DESIG[illegible]XP[illegible]MENTS AND COLLECT ACCURATE DATA. STUDE[illegible]S [illegible]ME ACTIVE MEMBERS OF THE COMMUNITY [illegible]R[illegible]S [illegible]NFORMATION THAT WILL BE VALUABLE [illegible] AND REGIONAL AGENCIES IN THE MANAGEM[illegible] OF [illegible]EA.

Site

Name and [illegible]ti[illegible]ar MEARES LAKE / CAPE MEARES, OREGON

Brief Descript[illegible]ude major impacts): FORMED IN 1956 WHEN A DIKE WAS BUILT - WATER COVERS ~ 65 ACREAS - SHALLOW WATER WITH AN AVERAGE OF 4 FOOT DEPTH - MARSH CONSISTS MOSTLY ON THE WEST AND NORTH SIDES - 118 BIRD SPECIES HAVE BEEN DOCUMENTED IN THE AREA - HUNTING IS PERMITTED - RESIDENTIAL AREA LOCATED AT THE SOUTH END - PUBLIC ACCESS ROAD ON THE DIKE

Project Specifics

Current Leadership or Direction: TEACHER

Expected Partner(s): U.S. FISH & WILDLIFE, OREGON DEPT. OF FISH AND WILDLIFE, CITIZENS LAKE WATCH

Expected Audience: HIGH SCHOOL SENIORS

Your Expected Role: FACILATATOR

Your Expected Steps in Meeting Project Goal and Objectives:
STUDENTS WILL DO PRELIMINARY WORK IN THE CLASSROOM TO RECOGNIZE WILDLIFE AND VEGETATION FOUND IN A WETLANDS AREA. FIELDTRIPS TO THE DESIGNATED WETLANDS WILL BE SCHEDULED FOR OBSERVATIONS AND INVENTORY OF THE WILDLIFE / PLANT LIFE. DATA WILL BE TAKEN AT REGULAR INTERVALS. SPECIES INVENTORIES WILL BE ACCUMULATED THROUGHOUT THE YEAR TO AID IN REGULATING HUNTING OF GAME SPECIES, PUBLIC USE OF THE AREA, ETC... WATER QUALITY TESTS WILL BE CONDUCTED TO AID IN

Identified Barriers: TRANSPORTATION TO THE SITE

Your Specific Needs (ideas, information, equipment, etc.):
DIP NETS
FIELD GUIDES
BINOCULARS / VIEWING SCOPE
SUPPLIES FOR NEST BOXES
MICROVIDEO CAMERA
WATER QUALITY TEST KITS
2×2 PROJECTOR SLIDES

Expected Outcomes (be as specific as possible): [illegible] SPECIES INVENTORIES OF BIRDS, [illegible] ANIMALS FOUND IN THE DESIGNATED WETLAND[illegible] THROUGHOUT THE YEAR. COMPARE RESULTS OF YEARLY [illegible] TO RECOGNIZE TRENDS. MONITORING WATER [illegible] TIME WILL BE USED TO MAINTAIN CURRENT STAN[illegible] OR [illegible] RESTORATION NEEDS. STUDENTS [illegible] THE WETLANDS' BALANCE AND HOW [illegible] OF [illegible] INTERRELATE. STUDENTS WILL BEC[illegible] CONCERNED MEMBERS OF THE COMMUNITY BY [illegible] ON BIRD SPECIES, ETC... TO LOCAL AG[illegible] IN MANAGEMENT. THROUGH THIS PROCESS EDUCATIONAL [illegible] PARTNERSHIPS WILL BE ESTABLISHED.

SAMPLE

Plan for Protecting the Wetland Resource: MAKE CONNECTIONS WITH OWNERS TO EXPRESS CONCERNS ABOUT THE PRESERVATION OF THE AREA. CONTACT "CITIZENS LAKE WATCH" TO SEE IF CAPE MEARES LAKE IS, OR CAN BE, PART OF THEIR PROGRAM. MAKE PLANS TO EDUCATE VISITORS THROUGH THE USE OF INTERPRETIVE SIGNS, WATCH TOWER, DESIGNATED PATHWAYS, ETC... MONITOR USE OF THE AREA BY THE PUBLIC AND DETERMINE THE EFFECTS ON THE WETLANDS ECOSYSTEM.

Timeline for Expected Outcomes: SPECIES NUMBERS WILL FLUCTUATE FROM SEASON TO SEASON AND YEAR TO YEAR. IN ORDER TO RECOGNIZE TRENDS IN WILDLIFE POPULATIONS AND PLANT SPECIES SEVERAL YEARS OF THOROUGH DATA WILL BE NECESSARY.

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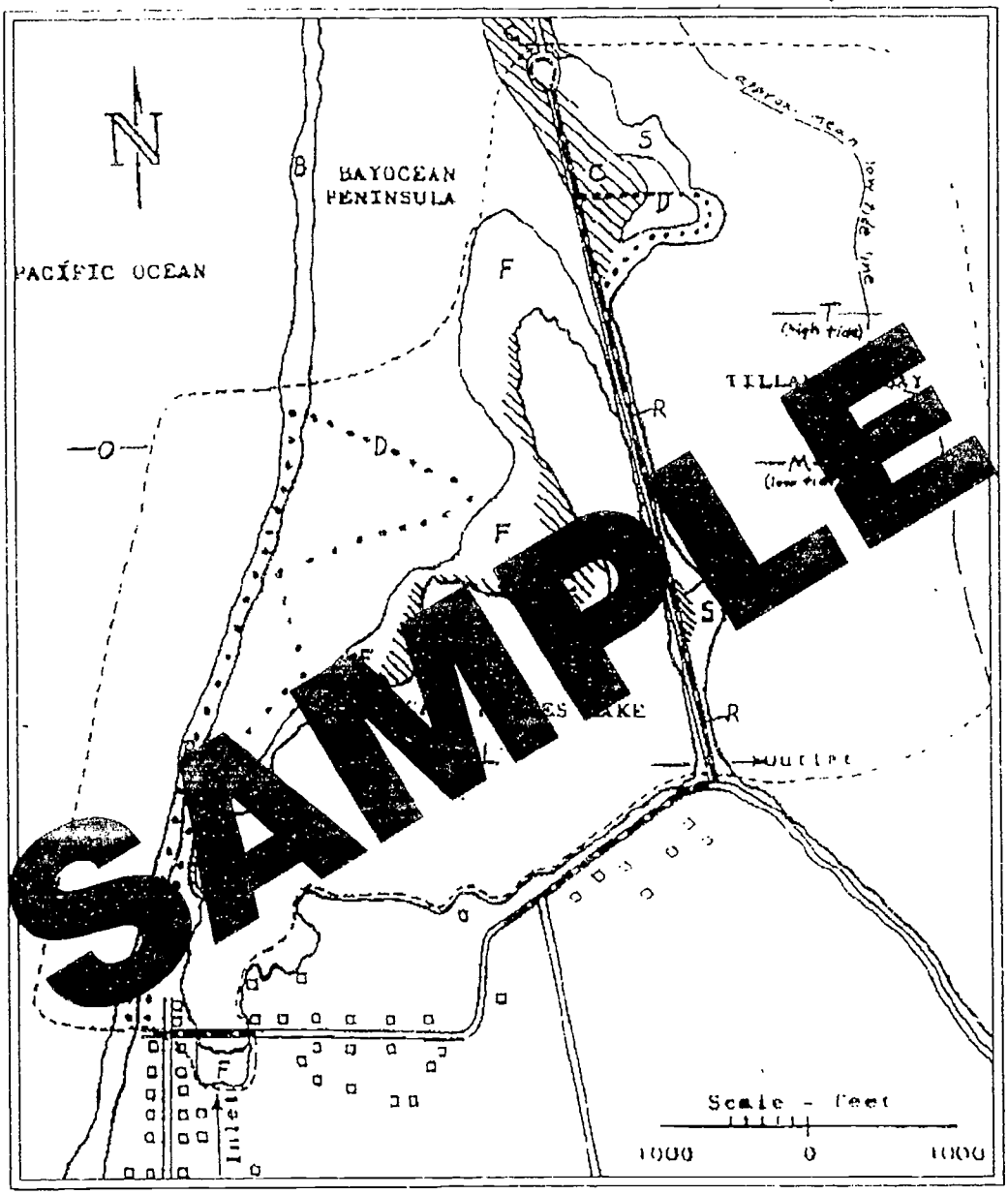

N
BAYOCEAN PENINSULA
PACIFIC OCEAN
B
C
D
S
F
R
O
M
T
(High tide)
low tide line
Scale - Feet
1000
0
1000
SAMPLE

Coastal Wetlands Institute for Educators
Tentative Wetland Project Plan

Written by Lynn Pruzan;

PROJECT TITLE: Schoolyard Wildlife Sanctuary Project

MISSION STATEMENT/GOAL: Fifth grade students and their teacher(s) at a Bellevue, WA elementary school research, plan, secure funding for, supervise the building of, then study and steward a schoolyard wetland sanctuary.

SPECIAL EDUCATIONAL OUTCOMES: Students will demonstrate abili[illegible]earch and plan a schoolyard wetland. They will learn to gather baseline data on the si[illegible]s a[illegible]s they will apply for funding for the project. They will supervise installa[illegible]on, seedi[illegible]ngs etc. They will then monitor the wetlands' functioning using current A[illegible]y techni[illegible]ssing wetlands. They will learn about and create effectiv[illegible] s[illegible]e. Th[illegible]y [illegible] celebrate the opening of the wetland site and teach other st[illegible]nts [illegible]the[illegible]un[illegible]munity to treat it well.

SITE: Ardmore Elemen[illegible] Scho[illegible] W[illegible]
A stream currently runs [illegible]e th[illegible]oo[illegible]yground. Children and neighboring residents throw litter [illegible]y ba[illegible] it[illegible]ss[illegible]lly do not understand nor steward it for its functions, play in th[illegible]atershed an[illegible] as habitat.

PROJECT [illegible]S: Teacher Dean Drugge has provided the leadership and direction for his Ardmore [illegible]t's environmental activism. His students have produced the Ancient Forest Puppet Theater, a mime and sign language performance on the importance of forest habitat, and have rescued a snag from the District's maintenance crew. Dean has taken his students to Olympia and Washington, D.C. to perform, and has won awards for this work, such as the Seattle Audubon Society's Educator of the Year Award. I proposed a schoolyard wildlife sanctuary to him and he appeared excited at the prospect. He and colleagues have purchased land in the Okanagan forest and deeded it in perpetuity to remain wilderness. He hopes to take his class to this land, to observe wildlife in real wilderness. The idea I encouraged is to take his students there, then return to school to apply what they observed in building an urban wildlife sanctuary.

EXPECTED PARTNER(S): Seattle Audubon Society, Washington Wetlands Network, Washington State Office of Environmental Education (Tony Angell), EPA (providing grants for model programs that integrate environmental education into the standard curriculum), Washington State Department of Fisheries and Wildlife (Steve Penland, as well as Russell Link, who is in charge of Backyard Wildlife Sanctuaries), Adopt-a-Stream Program, DOE Wetlands Education Division, Coastal Studies and Technology Center, Washington GAP Analysis Program, KCTS-TV (PBS affiliate) to create a film about the project so other schools can follow this example, WA State Representative Ken Jacobsen.

EXPECTED AUDIENCE: Dean Drugge's class for the '93-'94 school year.

YOUR EXPECTED ROLE: Volunteer consultant, grant writer and p[illegible] director. I will write either an article or a manual on how to do what Dean's class does, [illegible] can facilitate their students' creating wildlife sanctuaries and interpretive [illegible]ers on K-[illegible]m.

EXPECTED STEPS IN MEETING PR[illegible]EC[illegible]O[illegible]AND [illegible]JECTIVES:

JULY 1993: meet with Dean [illegible] fo[illegible]on and materials students will need to meet education objectives speci[illegible]

AUGUST 1993: prep[illegible]p[illegible]al t[illegible]et with and invite cooperation of partners listed above.

SEPTE[illegible] t[illegible]students to study Okanagan wilderness site and begin baseline monitoring of sch[illegible]val a site including GAP Analysis data gathering.

FALL QUARTER 1993: student trips to stream sites with interpretive centers or signage attached, continued GAP data gathering, study of stream/watershed hydrology, vegetation. Also students apply for funding of the schoolyard sanctuary project and write away for applications and information. They also keep journals on the project.

WINTER QUARTER 1993-1994: student observations and monitoring of seasonal changes in wildlife near and in stream. Finalization of drawings and plans for sanctuary.

SPRING QUARTER 1994: installations, seeding, plantings by students. Research and creation of interpretive signage by students. Planning of opening festivities for sanctuary.

SUMMER: 1994 Lynn works with Russell Link (Backyard Wildlife Sanctuary Program, WA Department of Fish and Wildlife) to publish manual on students creating and studying in a schoolyard wildlife sanctuary.

FOLLOWING YEARS: Students peer tutor younger students and their teachers in how to use the sanctuary site for study. Publication of student reports based on data collected at the site. Establishment of relationships/partnerships with relevant agencies so students can work for these agencies' monitoring off-campus wetlands.

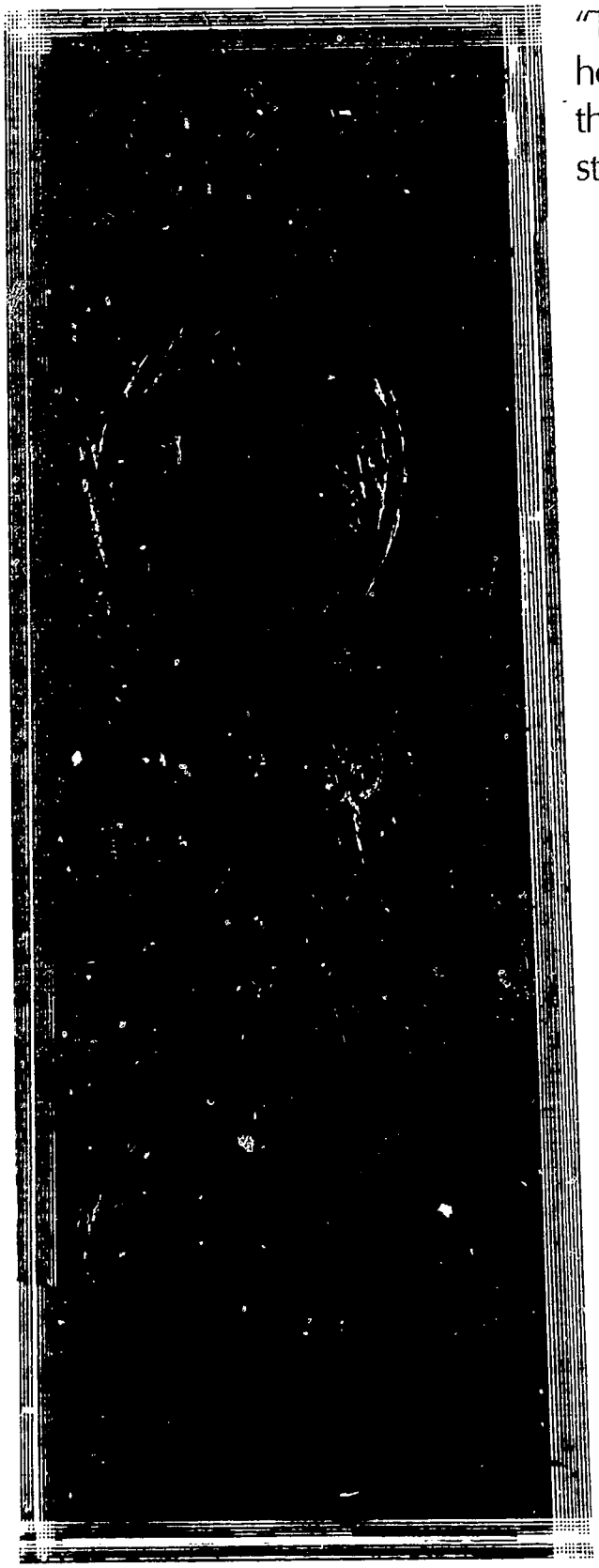
IDENTIFIED BARRIERS: School District grounds regulations; need to work with maintenance crews so sanctuary is not destroyed or disturbed in the name of grounds cleanup.

SPECIFIC NEEDS: Equipment for GAP Analysis monitoring and data gathering, wetland study and monitoring equipment, tools and supplies to building and plant on[illegible] with native plants in sanctuary area, signage materials, resource books/films/videos/[illegible]on[illegible]ands for school's instructional materials center.

EXPECTED OUTCOMES: These are listed in the SPE[illegible]CATIONAL OUTCOMES SECTION on page 1 of this proposal.

PLAN FOR PROTECTING THE WETL[illegible]RE[illegible]CE: It is currently unprotected. The project will make sure it is protec[illegible]l and [illegible]red [illegible]stewarded.

TIMELINE FOR EXPECTED OU[illegible]: See EXPECTED STEPS section above.



"The greatest challenge of the day is: how to bring about a revolution of the heart, a revolution which has to start with each one of us."

Dorothy Day

Part 3:
PROGRAM STRATEGIES

You have the proposal, you have support, there is building enthusiasm for the project...what do you do next? Part 3 will offer ideas about how to generate and sustain interest in the program as it develops.

Create an Identity

Your students and others involved in the project will feel much more ownership if the site you have chosen has a name or an identity. It is probably more powerful to have the students highly involved in the process of creating an image for the site rather than having an image imposed on them. You will want to guide them in coming up with an attractive logo that can be used on your future newsletters, correspondences, signs and t-shirts. You may want to consider letting people know what your purpose is in the construction of the name. Are you a resource center, a study center, a technology center, or something else? Is there some special plant, animal or geographic feature at your site that would make a good symbol?

Increase Community Contact

Support for your program will grow if people know about what you are doing. Cultivate a relationship with your local newspaper reporters. Let them know when your students will be out in the field, when you are putting up a sign to identify your site or have special activities planned. Your students can write and publish a simple, informative newsletter to be distributed to the community about their work and goals. Invite partners and potential partners or other influential persons in your community to observe what your students are doing. People often like to jump on the bandwagon of an interesting project and partnerships can develop from public knowledge of the program.

Create a Student Leadership Component in Planning

You can plan yourself silly, but if the project doesn't have student ownership and support your plans will soon sink with apathy or resistance. Students need to feel like it is their program. They need to be active citizens in the process right from the beginning. Having student representation at the planning level will lend legitimacy to tasks proposed for students to accomplish. It can be a powerful growth experience for the students involved.

Spend Some Time on Aesthetics

If you think back to your own interest in the natural world it is usually linked very closely with a love of place. Allow your students time in their special environment to observe the natural world in a holistic way. Love of the natural world doesn't come from performing pH tests. It comes from watching spiders build their webs or resting in the sun in tall grasses and listening to a killdeer sing. Set up intentional aesthetic activities for your students early on in the program. You'll end up with strong advocates for the site. Emotional responses to the environment are not irrational responses; and emotional ties to place are often the best motivations to action!

Approaching Resource People

Depending on your circumstances you may want to use resource people as special advisors or you may want to form partnerships with one or more of them that includes actually working on projects that they are involved with. Resource people as guest speakers in the classroom probably has limited value. If you can arrange for your students and staff members to work directly with resource people it can lead to much larger rewards for everyone. Linkage to the community is an important aspect of exemplary programs and the outer connection of the school to the community is integral to the maintenance and continued growth of programs such as these. Because most resource people have many duties in their job descriptions, they are busy people. If you can approach them with detailed specific needs and directions about how they might help you with their expertise, their time will be used much more effectively.

Remember when approaching resource people:

1. Have clear project goals.
2. Be open minded; put away preconceived notions.
3. Be an effective communicator.
4. Progress at a pace that accommodates everyone.
5. Be realistic about what can be accomplished with limited resources.
6. Give credit where credit is due.
7. Maintain your sense of humor.

from Defenders of Wildlife's NATURE WATCH 1992

Funding Ideas

Money always seems to be a limiting factor in program development, but don't let a lack of funds discourage you. Many activities can be done without much money. Exploring and getting to know the site, doing plant and animal inventories, making maps, observations of seasonal changes or planning an awareness celebration for the school or community can all be accomplished with a minimum of funds.

Keeping the community and the media aware of your plans and goals can lead to opportunities for donations from businesses such as volunteers, money, equipment or supplies. Parent/Teacher organizations can be a source of funding as well as a source of volunteer helpers. Motivated students can also be excellent fund raisers using all those time proven school fund raising techniques. You and your students may also be able to come up with a product associated with your site such as t-shirts with the logo, wildlife art or photography from the site, or some other product or service. Cities may be able to donate time or materials. Agencies also sometimes have funding for plantings or restoration work. Cities and agencies may be able to provide tools and advice from staff people.

There is always the potential for grant writing as a source for funds. This approach to raising money is often available but comes with the fears of how to get started, who to ask, what to say and, of course, finding the time to write the grant. Another factor to consider is the fear of getting the grant. Most granting organizations require you to do what you promised in the grant! This is where your program plan becomes a valuable resource. A good plan is the first step in approaching a funding source. As for who to ask for funding, the list of possibilities can be overwhelming. Start with a few inquiries with local agencies and ask others who have written grants. Most people are very supportive and helpful. If you stay with a reasonable plan, your program will blossom with the assistance of a grant and not degrade into unfulfilled dreams.

Field Techniques

Many teachers feel uncomfortable taking their students outdoors. It is a much less structured setting and chaos can quickly ensue. A bad field experience can leave a leader longing for those wonderful rows of desks back in the building! Field study does require some special skills and planning, but the harvest you and your students reap is rich!

There are some risks being in the natural world, from twisted ankles to bee stings; but the possible rewards far outweigh the risks. Safety is an important concern in the field. Make sure you have a first aid kit with you and know what to do in an emergency. You may want to check on your school's insurance policies for field settings. Many risk factors can be greatly reduced by explaining clearly to your students what your expectations are for behaviors in the field.

Setting the same kind of clear behavior expectations for the field as you have in your regular classroom is essential. Let students know that you have boundaries that they must respect, being sure to be clear about what areas are off limits and why. Have set work areas for each group. It is often easier to explain tasks and rules inside the normal classroom setting before you set off into the outdoors to do your field work.

Spending a bit of time on field ethics is a valuable thing. Students don't automatically know that they need to be quiet, to not disturb plants and animals unnecessarily, or that horseplay is not acceptable. Most of the time when we allow students to be in the out-of-doors it is for unstructured play. It takes some training to get the message across that outdoors doesn't always mean recess.

Group size is another important factor in the success of field work. Small groups function much better than large groups!! Have a job for everyone. Having tasks that keep the students focused brings the potential for misbehavior down. If you are the only leader, use a "hub" approach. Have a central location from which you disperse and gather your student work groups. It is also important to realize that not all students need to do everything. Often it is better to have students become the "experts" at a certain job or subject area and to share their findings and knowledge with the others.

Minimize Your Impact/Earth Ethics and Etiquette

One of your most important roles in the program is as a role model for student behavior. Your actions speak much louder than your words and children will treat the environment much the same way that you do. This can be an enormous opportunity to teach land ethics without ever saying a word. Your decisions about collecting, the way you treat plants and animals in the environment, and what your expectations are for your student's interaction with the site are all powerful messages about how to treat the planet. Children should be engaged in decisions about when, why and how to collect samples. Is it appropriate? Is it necessary? What valuable thing will we learn from the experience? Examine ways in which your visits impact the natural world. Are there ways that we can reduce those impacts and still learn the things we want to? How long lasting are our disturbances? Bringing these kinds of questions into the consciousness of your students will help them to form and examine their own beliefs on these issues.

Project Ideas

The following is a list of possible project ideas for you and your students.

- organize community or school celebrations of your site
- improve or build trails
- create and install interpretive signs
- build boardwalks, viewing platforms or docks to reduce impacts
- build wildlife viewing blinds
- monitor water quality
- monitor human impacts
- track down sources of pollution
- map drainages/water system paths
- map the site
- collect biotic data/do inventories
- create a slide show about your site
- create a video
- do wildlife enhancement
- build and install bird and bat houses
- do erosion control
- plant native vegetation
- remove exotic species
- do stream enhancement
- write a newsletter
- give tours
- write a field guide for the site
- do photography (art or documentation)
- help with an on-going research project
- develop research projects of your own
- clean up litter
- repair vandalism
- give wildlife art exhibits
- become public speakers for community groups on your site
- undertake restoration projects
- create an ecosystem on your school grounds
- get involved with local land use planning
- design a display about your site
- attend local planning meetings
- create a logo
- name your site
- design and make name tags for your staff (students)

"Protecting something as wide as this planet is still an abstraction for many. Yet I see the day in our own lifetimes that reverence for the natural systems— the oceans, the rain forests, the soil, the grasslands and all the other living beings— will be so strong that no narrow ideology based upon politics or economics will overcome it."

Jerry Brown

Part 4:
MODELS

The following pages include four different models of programming based on a nearby natural resource area. Two of the models are elementary schools and two are high schools. They are all currently active and ongoing. Please feel free to contact any of them for advice and support. There are programs such as these budding all over the region. They exist in rural, urban and inner city settings. Keep your ears and eyes open and you will hear about people who you can seek out for advice and inspiration.

Montclair Wetlands Study Center
Montclair Elementary School
7250 SW Vermont
Portland, Oregon 97223
(503) 591-4548

Program Coordinators:
Don Hunt- Principal
Luann Soderstrom- 5th grade teacher
Marietta Kuykendall- 6th grade teacher

Site Description:
Montclair Elementary School is lucky to have a small marsh right next to their school grounds. Fanno Creek runs through the marsh. Both the marsh and the stream are degraded and in a developed urban area. The site is in private ownership and the owners have an operating radio tower on the site. Permission to use the site was procured by teachers and students with the provision that they stay clear of the tower and don't do any major digging. The City of Portland's Bureau of Environmental Services is highly involved with the site as well, because they have plans to do some restoration work there. They plan to use the restored marsh as a filtration system to help improve the water quality of Fanno Creek. The site has a fair amount of wildlife activity, including beavers, raccoons, waterfowl, red-tailed hawks and song birds. There is moderate diversity in wetland and upland plants.

What Kinds of Things Did They Do? Who Helped?

The teachers and students involved wrote to the current private owners of the site to seek permission to use the marsh as a study center. Contacts were made with the Bureau of Environmental Services (BES) and an education specialist from that organization became involved in the project. Leadership and support were provided by Jackson Bottom Wetlands Preserve through a grant from The Governor's Watershed Enhancement Board (GWEB). The education specialist at Jackson Bottom made weekly visits to the classrooms to lead field studies and other activities and to act as a facilitator. A logo and name for the marsh were developed with assistance from a graphic artist from BES. BES was interested in collecting

some baseline information before they began their restoration project. The students worked to collect information on water quality, standing water levels and did Streamwalks, an Environmental Protection Agency program, on Fanno Creek. Plant and animal inventories were taken with a formal herbarium being produced. Along with these activities students learned about animal tracking, built and installed bird and bat houses and took field trips to other wetland types including coastal estuaries. A wetlands celebration assembly was held at the school in the spring for the other students and the community. The celebration included presenting the school with a mounted red-tailed hawk the students found dead at the site and raised money to have mounted; performance of a special wetlands theme song produced by the students with the help of their visiting artist in residence; a presentation by a falconer who had a trained red-tailed hawk the students met while at their outdoor school; and an announcement to the public that the school had voted to change their school team name from the Vikings to the Red-tails!

Future Plans:

Montclair Wetlands Study Center has expanded from two classrooms to five classrooms this year. They have a great deal of support from their administrator and Parent/Teacher Organization. With help from Jackson Bottom and BES the group submitted a grant to Metro Greenspaces for funding for equipment and teacher relief time. Each involved teacher has selected a focus area of study for their group. BES and Jackson Bottom Wetlands Preserve plan to continue their supportive roles at the study center.

Nancy Ryles Watershed Study Center
Nancy Ryles Elementary School
10250 SW Cormorant
Beaverton, Oregon 97007
(503) 591-4580

Program Coordinators:

Shelly King- Principal
Jeanne Bradley-5th grade teacher
Neil Brown- 5th grade teacher

Site Description:

Nancy Ryles is a school just completed as students were ready to begin school in the fall of 1992. The building is next to a "natural resource corridor" left in place by the developers of the new housing complex where the school is located. The site consists of a small intermittent stream in a narrow canyon. The stream feeds into a larger year round stream that eventually empties into a wetland mitigation pond system near a shopping mall at the base of the hill. The students took trails to study the whole small watershed several times during the year but most activities took place in the natural resource corridor next to the school. Control of the corridor is through the City of Beaverton and the local homeowner's association. The site continues to have homes built all around its edges and to have trees removed for construction. It is only 25 to 50 feet wide on average. The site currently has a healthy assortment of native uplands plants, small mammals and songbirds.

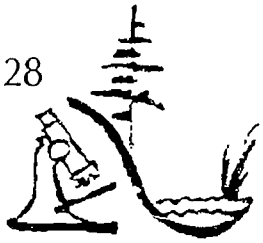
What Kinds of Things Did They Do? Who Helped?

Teachers and students tried to get the City of Beaverton and the homeowner's association involved in the program but didn't get much response. Jackson Bottom Wetlands Preserve through the GWEB grant provided leadership and support. Jackson Bottom education staff made weekly visits to the classrooms to lead activities and to act as facilitators. This study center had strong administrative support and remarkable parent involvement. The teachers and parents were very active in organizing guest speakers and materials for activities and there were parents who were year-long volunteers. These parents lead groups and brought in resources from the larger community. There was an interesting opportunity when the first fall rains occured at Nancy Ryles. The brand new building was constructed on steep slopes and the landscaping and some of the slopes began to erode and slide down into the "natural resource corridor". These problems became the first learning opportunities. The planners and contractors were invited to the classroom and the students explored solutions to the stumping problems. We studied soils, sediment fences, stabilization plantings and how water behaves on slopes. Students were doing Environmental Protection Agency Streamwalk data collections on their stream, did plant and animal inventories, built and installed bird and bat houses and labeled storm drains in many of the newly constructed neighborhoods. Informational door hangers were distributed when we did the labeling. Watershed newsletters were produced and distributed and the watershed was a main theme for the spring open house. Students created displays, a contour map of the canyon, and put together a environmental song and dance performance. Students went on field trips to visit other wetland types including coastal estuaries and took a trip to the Bonneville Dam. The students also had a year long relationship with the primary grades and took their "buddies" on tours of the watershed and wetlands below and also did some outdoor activities with them.

Future Plans:

Nancy Ryles Watershed Study Center has expanded this year from two classrooms to all of their 5th and 6th grade classes. They hope to submit a grant to Metro Greenspaces to do some trail design and construction to make the watershed a part of the trail system in the development. Jackson Bottom Wetlands Preserve staff will continue to offer support to the study center.

Hood Canal Institute for Ecological Studies
North Mason High School
P.O. Box 167
Belfair, Washington 98528
(206) 275-2811



Program Coordinator:
Karen Lippy-high school science teacher

North Mason School District is in its fourth year developing programs around the Theler Wetlands, which they own. I have been working on projects with my students and currently am at the point of developing what we are calling the Hood Canal Institute for Ecological Studies. It is being organized on the Coastal Studies and Technology Center model set at Seaside High School in Oregon.

The Institute allows students the opportunity to act as scientists and active citizens in projects that affect their local community. As their manager, I arrange projects with local community groups and public agencies. I also help them organize projects that they initiate based on their interests. Currently, the Institute primarily "employs" students in a class called the Aquatic World, however students from other courses are beginning to become involved also. In the future, we plan to have a separate class devoted to the Institute, and still have students from other classes involved in some projects.

Institute staff (students) fill out applications to work on various jobs and keep logs of their work hours. They are expected to perform quality work and all projects have quality control strategies built in.

Some of the projects we have undertaken include stream revegetation with the help of a citizen group, posting of Department of Ecology salmon creek signs and writing articles for the local newspaper on each salmon stream posted for the WSU Cooperative Extensions Water Quality Team, and monitoring activities on the Theler Wetlands. Data being collected is being placed in data bases for easy management and future reference. Staff has been collecting data on birds for the Washington Dept. of Wildlife's GAP Analysis Project and training younger students to collect this valuable information. Two small local streams that have been damaged by human activities are being monitored and proposals will be developed for their restoration. Many students are starting monitoring projects of local water bodies near their homes. In the spring, more large revegetation projects will be completed on the Union River. Two students are testing for heavy metal contamination of the Union River using a daphnia mortality technique. We have assessed five miles of Union River using the EPA Streamwalk.

The goals of this project are to allow students to do real science, to interact with the environment and others directly and dynamically, and to develop marketable skills for their future. We hope students who complete work in this program will be better citizens, more understanding of the nature of science, and have established a bond with their environment and community.

Written by Karen Lippy

Coastal Studies and Technology Center
Seaside High School
1901 N. Holladay Drive
Seaside, Oregon 97138
(503) 738-5586

Program Coordinator:
Mike Brown-high school biology teacher

Coastal Studies and Technology Center

An exciting approach to science education is being piloted in School District # 10 at Seaside High School in Seaside, Oregon. This program uses a new model in which student/citizens work with community members, university researchers and scientist mentors across curricular areas to investigate everything from local issues to global problems. It is a model based on integration and cooperation.

The model has led to the establishment of the Coastal Studies and Technology Center (CSTC) at Seaside High School. The center was founded with the goal of empowering students, staff and citizens from the local community with opportunities to work together to investigate problems and issues which affect all of us as citizens living on the North Oregon Coast. The center has worked to provide technology for use by all groups who use the center. We have established educational partnerships with many groups to provide opportunities for our students. We are currently working with scientists from Portland State University and with the National Marine Fisheries Service. Our students work with these scientists on research projects which are of interest to the scientist's organizations. The scientists act as mentors for the students, provide equipment for the students to use while they collect and analyze data and forward it with their reports to the scientists. Students and scientists respond to each others' analysis and make plans for the next set of observations. The Coastal Studies and Technology Center believes that original scientific research is a very important and powerful way to examine science concepts and to increase student interest.

The Coastal Studies and Technology Center has been very interested in school restructuring. In the CSTC there are no students or teachers; there are student/staff members and there is a director. Students participate at many levels in the center. There are small research groups where students work on small group projects like weather monitoring with our Solus Weather computer as members of PSU's MetNet; or they may be working to set up a conference/information talk night by noted Oregon anthropologists to speak on the coastal Indian midden mounds located in Seaside. The CSTC is the only Oregon school participating in the Global Laboratory Project, which is run as a National Science Foundation grant through the Technology Education Research Center in Cambridge, Massachusetts. Global Laboratory is a project that connects 75 schools around the world through telecommunications (Eco-Net). Students communicate on social, scientific and cultural issues. Students work together on global change monitoring, share data and work with mentor scientists to learn

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science concepts and processes while cataloging global environmental change. Student/staff members also have staff training where they learn information, have discussions and make plans about how to explore the science concepts they are studying in the projects they are involved with. Students have been involved in many local, national and international projects. We have been very involved in wetlands monitoring and wetlands mitigation monitoring, water quality and mapping. We have worked with our local city administration on projects involving wetlands monitoring and mapping of river channel islands. We have examined some of the effects of change on our local community including evaluating a speed limit change with the local police department on a segment of the Pacific Coast Highway 101. We have also done an in-depth study of how our local community has been affected by tourists during spring vacation and looked at options to improve negative situations that come from that.

The CSTC has four IBM compatible computers at its disposal along with a very sophisticated lower atmosphere ozone analyzer. We also have a remote monitoring weather station, a full computerized weather station, satellite picture receiving station and survey/mapping equipment. The center is connected to a telecommunications network via modem to Eco-Net and PSI-Net. All of this equipment has been obtained through partnerships with organizations and donations from corporations and citizens. The total budget for this year, including the center and my regular science classes was $1000.00. It has been a major difficulty for us to find the financing to continue and to develop our own restructuring opportunities.

I feel that our students have had opportunities this year that have never been available before because of the Coastal Studies and Technology Center. Students need to be empowered to become part of the resource management process. I believe our model in Seaside is a powerful way for students to participate by working with scientists and community members to address problems we all face. Students don't need to use school as a place to practice for the future. They can be involved and help lead the decision making today. My students are now being asked to attend city planning commission meetings and to attend conferences to share their work. This takes learning for all involved to new levels and helps to bring more information and a greater chance for consensus to Oregonians as we try to plan for the changes of tomorrow.

Written by Mike Brown

Part 5:
CLOSING THOUGHTS

Change will only come to our systems through the efforts of individuals. Though change is difficult and frightening, it is also empowering and growth producing. It is up to you to try things out, to experiment with ideas and to not be afraid of failure or of success. BE ALERT! This approach to student/citizen involvement can become a self perpetuating system...a machine that may be difficult to stop once engaged!! Don't be surprised when you become the center of excited interest emanating from your students, their parents, your colleagues and administrators! We owe it to our students and the earth to try!

Part 6:
APPENDIX

A Wealth of Partners (from Defenders of Wildlife's Nature Watch 1992)

Listed here are just a few of the types of partners you might consider when soliciting support for your site's development.

Federal Agencies	**Private/Nonprofit**
U.S. Fish and Wildlife Service	Conservation Organizations
USDA Forest Service	Audubon Groups
Bureau of Land Management	National Wildlife Federation
National Park Service	Defenders of Wildlife
U.S. Corps of Engineers	Sierra Club
Bureau of Indian Affairs	Garden Clubs
Federal Highway Administration	The Wildlife Society
Environmental Protection Agency	American Fisheries Society
Soil Conservation Service	Environmental Ed. Groups
U.S. Dept. of the Navy	Naturalist Organizations
U.S. Dept. of the Air Force	League of Women Voters
U.S. Dept. of the Army	American Asso. of Retired Persons
Bureau of Reclamation	Native American Tribes
	Private Landowners

State Agencies

Fish and Wildlife
Tourism
Parks and Recreation
Transportation
State Lands
Ecology/DNR
Land Use Planning
Forestry
Environmental Quality
Agriculture
Commerce
Water Resources
Education
Marine

Local Agencies

City/County
Parks/Planners
Schools
Visitor's Bureaus
Soil and Water Conservation Districts

Political

Governor
State Legislature
Congress
Local Officials

Industry

Tourism
Travel Agencies
Chambers of Commerce
Airlines
Car Rental
Charter Tour Groups
Guides
Hotels/Motels
Restaurants
Real Estate
Oil Companies
Timber
Livestock
Photo Binocular, and
Recreational Equipment

Educational Institutions

Extension Service
Colleges/Universities
School Districts
Nature Centers