HRSEP: 00-FRB(L)-HR-025

FISS: DFO 336

HRSEP 2000/2001 FINAL REPORT

Habitat Restoration Contract : #00 – FRB(L) – HR – 025

Project Reference: # F1528 – FO01 – 0079

Project Title: Langley Watershed Restoration Projects

PROPONENT INFORMATION

Organization Name: Langley Environmental Partners Society

Contact Name, Title: Lonnie Prouse, Executive Director

Mailing Address: 4914-221 Street, Langley, BC, Canada, V3A 3Z8

Phone: 604-533-6136 Fax : 604-533-6098

Alt Phone: 604-533-6054 Alt Fax:

Email: Lprouse@tol.bc.ca lepsgen@tol.bc.ca

Web Page: http://www.leps.bc.ca

Township of Langley (ToL): financial support, provision of office and equipment, technical support, project planning
Greater Vancouver Regional District (GVRD): technical support and assistance with stream restoration on Little Campbell River (Campbell Valley Regional Park)
School District #35: volunteer labour for stream restoration through the Career Preparation Program (CPP)
Ministry of Environment, Lands and Parks (MoELP): financial support for stream restoration materials, technical support and assistance with project planning and execution
Bertrand Creek Enhancement Society (BCES): financial support for stream restoration materials, landowner contact, assistance with project planning, volunteer labour for enhancement projects (for projects on Bertrand Creek)
Salmon River Watershed Management Partnership (SRWMP): assistance and promotion of projects on Salmon R.
ttle Campbell Watershed Society (LCWS): financial support for stream restoration materials, ıdowner contact, assistance with project planning, volunteer labour for enhancement projects (for ɔjects on Little Campbell River)
ɔrkson Watershed Stewardship Committee (YWSC): landowner contact, assistance with project ıanning, volunteer labour for enhancement projects (for projects on Yorkson Creek)

Human Resources Development Canada (HRDC): financial support (summer students to assist with stream restoration and inventory projects)
Ministry of Agriculture and Food (MAF): support and assistance with agricultural stewardship projects; promotion of watershed stewardship projects within the agricultural community
Streamside landowners: financial support (partial cost of materials), volunteer labour and equipment
University of British Columbia (UBC): stream restoration project planning (Forest Conservation class)

PROJECT INFORMATION

PROJECT PREPARATION

Project Rationale (**Why** was this project important?)

1) Salmon habitat degradation
Until recently, Langley's streams and rivers have supported large numbers of salmon, particularly coho, steelhead and cutthroat trout. Fish habitat in Langley streams has suffered severe impacts from agricultural, urban and industrial development, leading to declining salmon populations.

Rapid development and lack of public awareness of salmon habitat considerations has lead to much habitat destruction and degradation in Langley streams. Eroding streambanks caused by livestock access and removal of streamside vegetation are causing large amounts of sedimentation of spawning gravels, and jeopardizing young salmon. Reduced riparian vegetation has caused not only bank erosion, but elevated water temperatures and increased water pollution. High nitrate levels have been noted in both ground and surface waters near agricultural lands. Widespread residential and industrial development has created problems such as flash flooding, pollution, lack of habitat complexity and barriers to fish migration.

2) Lack of complete stream habitat information
Lack of complete information on stream locations and habitat conditions means developments are not planned with salmon habitat in mind, and valuable habitat is being lost. Having complete stream location and habitat data available to municipal planners would assist with protecting sensitive salmon habitat in the face of strong development pressure. Government agencies and community groups also benefit from having available a complete inventory of habitat conditions, problems and potential enhancement sites.

Over the past 5 years, LEPS has mapped and collected habitat data for approximately 90% of Langley's stream network, including updating the creek maps in the municipal Geographic Information System (GIS). However, the database is not as effective as it could be. Further information on stream locations, habitat conditions, water flow and fish species will create a more complete database for municipal planners and community groups to make informed decisions about development near salmon bearing streams.

Was a feasibility study or pre-assessment done for this project? Yes No ✓

If yes, please describe when and by whom.

Did you receive DFO input on this project? Yes ✓ No ☐

Name, Title, and Location of DFO Contacts that helped you with this project:	Matt Foy, Habitat Restoration Biologist Brad Mason, Habitat Inventory Coordinator Joe Kambietz, Community Advisor Christina Engel, Habitat Auxiliary

PROJECT OBJECTIVES (FROM "APPENDIX A" OF YOUR CONTRACT)

Objective # 1 : To restore over 5 km of degraded and/ or inaccessible salmon spawning and rearing habitat.

Was it achieved?: Yes ✓ No ☐

Details:

LEPS achieved objective #1 by:

- erecting livestock exclusion fencing,
- planting native riparian vegetation,
- stabilizing eroding stream banks,
- enhancing access at barriers to fish passage (improperly sized and blocked culverts and other identified barriers to rearing and spawning habitat),
- constructing weirs,
- building structures to recruit spawning gravel.

Objective # 2 : To collect information on stream locations, habitat conditions, water flow and fish species in selected streams around Langley Township (streams in areas under severe development pressure), and use this information to update the municipal database.

Was it achieved?: Yes ✓ No ☐

Details:

LEPS achieved objective 2 by mapping 70 kilometres of West Creek and 24 kilometres of Little Campbell. Approximately 40 fish traps were set for fish sampling over the duration of the project. Some data has been made available to local government planners, community stewardship groups and regional staff of senior government agencies.

Objective # 3 : To increase public awareness of salmon streams and habitat concerns, and to increase community participation in local stream stewardship initiatives.

Was it achieved?: Yes ✓ No ☐

Details:

- Over 15 presentations to school classrooms
- 10 teachers trained in streamkeepers
- 30 volunteers trained in streamkeepers
- over 1 000 community members participating in BC Rivers Day
- over 80 Surrey residents received information on stormdrains in urban areas during the Salmon homecoming event
- Township employees, mayor, councilors and agency staff received info on LEPS projects and local streams and watersheds @LEPS open house
- over 25 teachers utilized the Streams, fish and Aquatic Habitats module of the Ecokit
- 2 environmental clubs set up at secondary schools

Objective # 4 : To provide valuable training and work experience to students and retraining fishing workers that will allow them to plan and conduct habitat inventory and restoration projects in communities around the province.

Was it achieved?: Yes ✓ No ☐

Details:

The crew received training in salmon habitat restoration (riparian planting, weir construction, livestock fencing, erosion control, and other in-stream habitat complexing), habitat assessment and inventory techniques (water quality testing, stream flow, stream inventory/mapping,SHIM and fish sampling), and project planning (budgeting, scheduling, staff and volunteer coordination, permitting, and fundraising).

PROJECT SUMMARY

LEPS hired a five person crew composed of students and retraining fisheries workers, and trained them in watershed assessment, inventory and fish habitat restoration techniques. The crew restored spawning and rearing habitat in local streams, and inventoried, mapped and assessed salmon habitat in areas targeted for development around Langley Township.

Crew training
The crew received training in salmon habitat restoration (riparian planting, weir construction, livestock fencing, erosion control, and other in-stream habitat complexing), habitat assessment and inventory techniques (water quality testing, stream flow, stream inventory/mapping and fish sampling), and project planning (budgeting, scheduling, staff and volunteer coordination, permitting, and fundraising).

Salmon habitat restoration
The LEPS crew conducted a series of projects aimed at restoring and enhancing salmon habitat in local streams. Specific salmon habitat restoration projects include:

- weir construction and access improvement for spawning salmon (Bertrand Ck.)
- placement of structures to recruit spawning gravel (L. Campbell River, Nicomekl R.)
- constructing livestock exclusion fencing (Salmon R., West Ck., Bertrand Ck., L. Campbell R.)
- extensive riparian planting (Bertrand, Salmon R., L. Campbell R., Nicomekl R., Yorkson, West Creek)
- streambank stabilization (Nicomekl River, Bertrand Creek, L. Campbell River)
- enlargement of pool below fishway for improved access (Cave Creek- Bertrand Creek)
- placement of large wood, rock and other habitat structures (L. Campbell R., Bertrand Creek)

The above projects were reviewed by staff from DFO and MoELP. These staff were available to assist LEPS with planning and completion of restoration projects. All projects were conducted to DFO and MoELP standards for work near fish bearing streams, and all in- stream work took place in the summer fisheries window.

The LEPS crew and community volunteers significantly restored degraded stream habitat for spawning and rearing salmon. Sedimentation decreased as cattle were excluded from streambanks and banks were stabilized (with native vegetation, wattles or riprap). Rearing habitat increased with the addition of riparian vegetation, wood and rocks. Both spawning and rearing habitats will improve as livestock are excluded from sensitive stream habitats and habitat structures such as rocks, weirs and spawning gravel recruitment structures are placed in the streams. Removing barriers to fish migration, large areas of spawning and rearing habitat were made accessible to salmonids.

Please see attachment

Stream assessment and inventory
In partnership with Langley Township, DFO and MoELP, LEPS has mapped and inventoried watercourses and sensitive habitats within Langley. SHIM was recently developed by federal and provincial agencies in order to provide a standardized method for mapping and assessing sensitive stream habitat. It takes an ecosystem- based approach, focusing on aquatic systems and their riparian areas, and provides current, spatially accurate data required for land use planning by local and senior governments. The method is being widely used in municipalities in the Lower Fraser Valley.
LEPS collected additional information to fill in existing gaps in Langley's SHIM database. The crew inventoried, mapped and assessed salmon habitat in selected rivers around Langley. Information on stream locations, habitat conditions, water flow and fish species was collected. This data was downloaded into Excel spreadsheets and municipal GIS, and is available to government agencies and community groups. One challenge we encountered is that mapping took more time than was expected due to equipment problems, and ddry weather this winter. For example, low flows are not ideal for mapping ephemeral streams.

Community involvement and public education
LEPS staff and volunteers from local stewardship groups contacted streamside landowners as part of this project, and provided information on salmon habitat issues and local stewardship initiatives. LEPS erected educational signs at publicly accessible locations where enhancement work has been completed, in order to increase public awareness of salmon streams and recognize the efforts of individual landowners working in partnership to protect stream resources. The society hosted field tours of completed restoration sites for streamside landowners who are considering salmon habitat restoration work on their own properties. These demonstration projects increased community awareness of fisheries habitat issues and local stewardship initiatives.

Project outcomes
Through this project, over 5 kilometres of degraded stream habitat was restored for spawning and rearing salmon by excluding livestock, planting riparian vegetation, improving access, decreasing erosion and sedimentation and increasing stream complexity. Other indicators of project success are less tangible, and include the education, training and work experience provided to students, retraining fisheries workers and community volunteers, evidenced by their ability to use these skills beyond the duration of the project. There is also a high value to increased community awareness of salmonid habitat, particularly within the agricultural community where there is a widespread perception that the interests of fisheries and farming cannot co-exist.

This project created cooperative partnerships between farmers, fishers, environmental groups and government, which will allow fish habitat to be protected and restored into the future. The increasing numbers of members working with LEPS and our partner stewardship groups, and the increasing numbers of landowners agreeing to participate in stewardship projects indicated a higher level of community participation in stream restoration initiatives.

PROJECT STATUS AND FOLLOW-UP

Please describe the current status of the project. Please comment on the following:

- Whether the project is complete
- Has the problem being addressed been solved? (see "Project Rationale" on page 3)
- Recommendations for future work

The Langley Watershed Restoration Project is complete. LEPS deemed this project important due to the salmon habitat degradation within the watersheds of the Township of Langley, and the lack of complete stream habitat information. The identified "problem" is not easily solved. LEPS, in conjunction with a number of community partners, were able to continue addressing this multi-layered problem. This project successfully worked towards restoring salmon habitat by streamside fencing, completing in-stream restoration activities, bank stabilization activities and re-planting riparian zones. In addition, LEPS supplemented the existing stream habitat information by filling in existing gaps in Langley's SHIM and stream survey database. This data will greatly assist government agencies to plan development without causing further degradation of salmon habitat.

Community involvement and public education played a large role in the success of this project. Throughout the duration of this project we contacted over 1,000 community members. Without involved community members, actively participating in the project LEPS could not have successfully launched the Langley Watershed Restoration Project.

A challenge we encountered is how landowners do not regard fish violations as a serious issue. Our goal is to inform landowners of the degradation that will result from particular actions. We want to be pro-active as oppose to re-active. At the same time, while working, we constantly witness degradation of habitat. There is the feeling among some landowners that LEPS acts as an informant to DFO. Thus if a landowner works with LEPS, then a fine is right around the corner and if a landowner does not work with LEPS, then a fish violation is not going to occur. We believe that stronger ties with DFO are necessary to effectively deal with this issue. Landowners need to be keep abreast of new legislations, the reasons for these legislations, who is there to help them comply with these legislations, and the consequences if they do not comply.

A future recommendation from LEPS is to amalgamate several database versions of stream surveys and fish sampling. This information would be invaluable to the Township of Langley.

PROJECT SUMMARY STATISTICS

The statistics you will provide below help us to determine the specific and overall achievements of the Habitat Restoration and Salmon Enhancement Program. A summary report will be completed in the winter of 2001/2002, and distributed to all previously funded proponents. This report will be available to all interested individuals and organizations.

PERSONNEL

Total # of persons trained (staff and volunteers): 132

STAFF		VOLUNTEERS	
Number of persons employed:	12	Number of volunteers involved:	120
Person-days of employment created:	424	Total number of volunteer hours:	360

ACTIVITY TYPE

Species Addressed (check all that apply):

Coho	✓	Chinook	✓
Pink		Sockeye	☐
Chum	✓	Steelhead	☐
Other (Specify):	✓	Rainbow & Cutthroat	

Activity type (check all that apply):

Inventory & Mapping (See #2 below)	✓	Stock Assessment (See #1 below)	☐
Public Awareness (See #3 below)	✓	Habitat Restoration (See #4 below)	✓
Stock Enhancement (See #1 below)	☐	Stewardship/Community Planning (See #3)	✓
Other (Specify):	☐		

QUANTIFIABLE RESULTS

1. For Stock Assessment and Enhancement Projects:

Number of Juvenile Salmon Enumerated:

Number of Adult Salmon Enumerated:

Number of Salmon marked/tagged or released:

Other (specify):

2. For Mapping & Inventory Projects:

Was your data collected in accordance with the DFO-HEB Info. Management guidelines or Sensitive Habitat Inventory Mapping (SHIM) guidelines? Yes ✓ No ☐

If yes, was it submitted in digital format? Yes ☐ No ✓

Linear or square metres of area mapped or inventoried: 94 m ✓ m^2 ☐

3. For Stewardship/Community Planning and Public Awareness Projects:

Number of Public Presentations/Media Releases: 30

Number of Landowners Contacted: 1002

Other (specify):

4. For Habitat Restoration Projects:

Habitat Addressed (Check as many as apply):

In-channel	✓	Lake	☐
Off-channel	☐	Estuarine/Marine	☐
Riparian	✓		
Other (Specify):	☐		

Fencing:	Stream length protected	2000 metres
	Stream area protected (fence-to-bank width x length along stream):	31 750 Square metres
Riparian replanting:	Area replanted	16 500 Square metres
	Number of trees/shrubs planted	8 161
In-channel habitat:	Stream area restored	N/A Square metres
Off-channel habitat:	Stream area created/restored	N/A Square metres
Estuarine habitat:	Area created/restored	N/A Square metres
Lake habitat:	Area created/restored	N/A Square metres
Fish Access:	Length of stream made available	1 000 metres
Total area of habitat made available (square metres):		20 000 Square metres

Other (specify):	Stream Inventory	100.5km

PROJECT LOCATION

This information will help us to enter your project into the "Fisheries Project Registry", a joint Federal-Provincial database that summarizes fisheries projects in British Columbia and the Yukon Territory.

	Name(s) or Code from the "BC Watershed Atlas"
Creek(s), stream(s), or river(s) where project took place:	Watercourses throughout Langley Township. Salmon habitat restoration is proposed on the Salmon River, Bertrand Creek, Nicomekl River, Little Campbell River, West Creek and Yorkson Creek.
Name of local watershed:	Salmon River, West Creek, Yorkson Creek: Fraser River Basin; Bertrand Creek: Nooksack River; Little Campbell River, Nicomekl River: Boundary Bay
Major Drainage (check one):	✓Fraser River ☐Mackenzie River ☐Columbia River ☐Skeena River ☐Nass River ☐Stikine River ☐Taku River ☐Yukon River ☐Other/Marine
Marine Statistical Area or Sub-Area:	
Nearest Community:	Stream restoration and inventory work is proposed near the communities of Langley City, Aldergrove, Murrayville, and Walnut Grove.
Other geographic information to help us locate your project:	**Watershed codes** Salmon River: 100-038-800 Nicomekl River: 900-004-300 Yorkson Creek: 100-033-300 Bertrand Creek: 970-046-800-252 Little Campbell River: 90-0080 West Creek: 100-041-600

Latitude: 49 00 to 49 40 Longitude: 122 27' to 122 40"

UTM Coordinates: Grid Zone: 10 Easting: 524000 E to 540000 E Northing: 5428000 N to 5448000 N

SUPPORTING DOCUMENTATION

Documentation Attached (Check as many as applicable)

Maps	✓ ✓	Brochure	☐
Photos	✓ ✓ photocopies	News clippings	✓ ✓
Data report	☐	Other	☐

FINANCIAL SUMMARY

HRSEP FUNDING SUMMARY

Since the HRSEP funding was announced in June, 2000, you have provided interim financial statements and project updates with your invoices to receive installments of your funding. One final financial statement that summarizes all spending of HRSEP money is required for your final payment. Please enclose your financial statement and final invoice with this summary report.

Total received from HRSEP to date:	$86 1132.00
Date:	March 26, 2001
Total HRSEP money spent and reported on financial statement form (please attach statement):	$9 560.00
Total received from HRSEP after final invoice is paid (if not already paid):	$95 692.00 ✓

HRSEP FUNDING DETAILS

Please enclose a copy of your HRSEP standard financial statement. These standard forms are available by mail or e-mail upon request from Elizabeth Leboe at (604) 666-8515.

It is not necessary to forward copies of individual receipts and invoices. As per the terms of your Habitat Restoration Contract, please retain these in your files for a minimum period of three years, as DFO reserves the right to audit all HRSEP projects.

OTHER CONTRIBUTORS

Contributions to the total budget may have been from other agencies or in-kind contributions from your own organization; please provide basic details below. Please add an extra page if necessary:

Funding Source Details	Amount of funding (please note if funding is 'in-kind')
Township of Langley: office, classroom space, maps. phone, fax, computers, software, office supplies	$6 000 inkind
LEPS: stream monitoring and restoration equipment, GPS, training for crew	$19 000 inkind
ToL: coordination and administration	$10 000
Streamside landowners: volunteer labour and services, materials and equipment	$14 600 inkind

CPP high school students: volunteer labour for enhancement projects and inventory	$5 000 inkind
UBC Forestry Conservation students: project planning- volunteer labour	$4 000 inkind
ToL, GVRD, MAF, DFO, MoELP: professional assistance, support and advice, project planning, equipment use	$8 000 inkind
MoELP: plants, fencing materials, signs	$17,350
BCES/ LCWS/ YWSC/ SRWMP: stream restoration materials and supplies, plants; landowner contact, assistance with site selection and project planning, project promotion and stream restoration activities	$20,000
HRDC: summer students to assist crew with instream enhancement projects)	$18,000

121,950 TOTAL.

Appendix A: Photos

Appendix B: Media Coverage

Appendix C: Map of Restoration Sites (Fencing + Planting)

Photos - Appendix A

Burke's 296-248th "Cave Creek"

Burke's 296-248th "Cave Creek"

Burke's 296-248th "Cave Creek"

Fould's, 264th Ave and 67th St "West Creek"

Grindrod's 22130-64th Ave "Orchard Creek"

McMillan's-Brookswood cubs and scouts, 2000

McMillan's / Lawrence's - Brookswood Scouts, 2000

Lawrence's 2000

Mackie's - "Nicomekl River"

McMillan's 271-248th "Cave Creek"

McMillan's 271-248th "Cave Creek"

McMillan's 271-248th "Cave Creek"

Stewardship set for three watersheds

The future of three watersheds in northeast Langley Township will be the subject of a community meeting Oct. 18.

The watersheds include Nathan, West and Palmateer Creeks, and the focus of the meeting will be on their importance, from an ecological, social and agricultural perspective.

The meeting is being hosted by the Langley Environmental Partners Society (LEPS), and the aim is to establish a community watershed stewardship group.

It will be held at County Line Elementary School, 26345 62 Ave., at 7 p.m. Leanne Leith, a spokesperson for LEPS, said that both West and Nathan Creeks have recently been designated as sensitive, under the B.C. Fish Protection Act. They are two of just 15 watersheds in B.C. to be rated sensitive.

Leith said that creeks in the eastern part of the township have some of the best habitat for fish, but unlike other township watersheds, have no stewardship committees.

Leith said decisions are currently being made that affect the future of the creeks, and residents should get involved. The stewardship groups will be open to all residents, and can include farmers, business owners, First Nations, naturalists, teachers, parents or any interested resident.

The watersheds are located in an area extending from Armstrong Road and 264 on the west, east into Abbotsford, from the Fraser River to Highway 1 and, in the eastern part of the township, south of the freeway.

At the meeting, community members will be invited to express their concerns about matters ranging from erosion and flooding to land use planning, and will hear about current activities in the area. They will be asked to get involved in formulating ideas for future action.

The committee would be made up of both Langley and Abbotsford residents.

Those who are unable to attend or want more information can call LEPS at 533-6054.

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WALNUT GROVE & FO

Celebration of rivers extended

Every year in September, a day has been set aside to celebrate the recreational, environmental, economic and aesthetic importance of B.C. Rivers.

This year the celebration, known as Rivers Day, is being extended to embrace a whole week, September 18 to 24. Its main focus will be to enhance students' and teachers' understanding of the importance of local waterways, and to give members of the public the opportunity to learn more about and experience our river heritage in an entertaining and informal atmosphere.

Rivers Week is sponsored jointly by the municipality and Langley Environmental Partners Society (LEPS), and supported by schools and community groups.

One of the highlights of the event will be the Rivers Day Festival which will be held at Williams Park. There, people can take part in nature walks, see stream enhancement projects, native plants and invasive plant species. Trinity Western University will have a display, and there will be music, entertainment and cardboard boat races.

Appendix B

Ald. Star June 8/02

Sea cadets help environment

LANGLEY - On Saturday, June 10, a troop of #47 Royal Canadian Sea Cadet Corps Captain Vancouver cadets from Stanley Park will be pulling into the Township of Langley to assist Langley Environmental Partners Society with a number of projects to celebrate Environment Week, June 4 to 10. The troop will be split into five smaller groups and sent to various sites, such as Williams Park and Yorkson Creek, to assist with projects such as invasive species control and litter removal.

Invasive species, such as Himalayan balsam and blackberry are non-native species that have become established in areas where they are not historically found. Many exotic species were introduced unintentionally by residents growing them in their yards and gardens. These species find the mild climate of B.C. and the absence of natural competitors favorable. Those factors, coupled with a high reproductive potential, increase populations dramatically. Exotic species can have extremely harmful, far-reaching effects for native ecological communities. Some exotics become so abundant that they reduce numbers and variety of native species, having a detrimental effect on biodiversity in an area. Removal of these species is very beneficial to our native ecosystems, but is only a small step towards the solution.

As litter adds to community degradation, creates pollution and endangers wildlife, litter control is a simple and effective project to enhance the beauty and cleanliness of our neighbourhoods. Garbage breeds more garbage and can lead to poor water quality and the loss of fish and wildlife habitat. The act of litter control halts the cycle of deterioration in the community and sets an example that can be maintained for years to come.

"We are pleased that the cadet troop will be able to assist with these very worthwhile projets, and we are happy to be able to raise awareness of important environmental issues for Environment Week," said Nichole Marples, LEPS volunteer coordinator.

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Langley Times, Nov 26/00

Making themselves at home

Busy beavers can be dam hard to live with

Those same creatures hat grace our Canadian ickel are headaches from ome streamside landown- rs.

Beavers create their omes by building dams sually along a stream. The lams slow the flow. creat- ng a clam pond upstream vhere the beavers live in heir protected lodge.

During the fall season, beavers are busy preparing or winter by stocking up n wood branches and toring them in the ponds or their winter food sup- ly.

Landowners and beavers don't always get along. In residential areas, he flooding created by beaver dams may en- croach on private land or back up water on roads and downed trees may topple over onto Hydro wires or homes.

For all the nuisance, beavers actually provide benefits which may not be as obvious.

Beavers dams hold back a great deal of water that could be flooding agricultural land downstream during high flows.

During the summer months, dams help streams that may otherwise dry up.

The large pond and woody debris creates vital habitat for juvenile coho salmon.

During the higher flows, which coincide with the return of adult salmon, the dams can break, allowing the spawners to pass.

COURTESY OF ENCYCLOPEDIA OF B.C.

There are some proven solutions to the unhappy relationship between landowners and beavers.

✓ Where protection of trees is critical, a simple one metre high wire mesh cage staked to the ground around the tree trunk may suffice.

✓ Plugged up culvert may be prevented with the use of "beaver deceivers", contraptions which confuse the beaver in its attempts to block the water flow.

✓ Flooded ponds can be reduced in depth by fitting the dam with a pond leveler essentially a pipe placed through the dam at a critical level.

It must be stressed that the removal of a beaver or the destruction of a dam is not always the best method of dealing with the problem.

Beavers live in families. Removing one beaver won't prevent the rest of the family members from continuing the work.

Even if the entire family is removed, it wouldn't take long for another family to move into the area. Removing a female during the spring leaves her dependent kids to starve in the lodge.

If a dam is broken up during the Autumn, the beaver will simply try to repair the dam by cutting down more trees. If a dam is destroyed beyond repair, the beaver will simply move onto another area, again taking more trees.

If a dam is broken just before the onset of winter, the beaver family won't be leaving their lodge to get any more food and will die a long, slow death from starvation.

Understanding the beaver is the first towards dealing with the problems they cause.

Please take the time to gather information before acting out against the beaver. This will ensure that we can all enjoy the wildlife we have right in our backyard for many years to come.

For more information on living with beavers, call Langley Environmental Partners Society at 533-6199.

Appendix B

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nting help wanted at Salmon

EY - Environmental Society is searching nteers to assist with vegetation on the iver.

g streamside trees and many benefits. Plant lize banks to prevent ilter runoff and hold which prevents rapid ns in water levels. shade to keep water res low enough for salmon species, and shrubs provide habitat and food for fish, birds and wildlife. Plants are generously being supplied through the Tree Canada Foundation and Trans Mountain Pipeline.

The tree planting will take place on agricultural property. Park at the Salmon River fish counting fence at the corner of Glover Road and Rawlison Crescent. LEPS staff will meet planters there and lead them to the site. Planting will take place on Saturday, April 8, between 10 am and 2 pm.

In order to assess the number of volunteers attending and equipment needed, contact Nichole Marples, LEPS volunteer coordinator, 533-6054 before Friday, April 7, if you are interested in participating. Girl Guide and Boy Scout groups welcome.

- SUBMITTED PHOTO

The Shortreed Community School's EcoTiger environment club prepare to clean up their

nment

seeking volunteers

premier environmental looking for help.

Environmental Partners ing for volunteers to help s and shrubs along the

n will protect the stream keep water temperatures birds and wildlife.

e asked to meet at the sh counting fence at the Rd. and Rawlison Cres. day, April 8.

uld take four hours. Call at 533-6054 if you want to help.

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Yorkson work

Walnut Grove residents are invited to an informal information session Tuesday, April 11, to learn more about the Yorkson Creek watershed.

Listeners will hear from the Yorkson Watershed Stewardship Committee about the state of the Yorkson and ways residents can help the creek.

The meeting starts at 7:30 p.m. on April 11 at Walnut Grove Secondary School. Call Lisa Burgess-Parker at 533-6199 for more information.

April 4,00 Advance News

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Shortreed Eco Tigers clean up

ALDERGROVE - The Shortreed Community Elementary School's EcoTigers Environment Club was formed in September 1999, to involve students in developing an understanding of the ecological interdependence of plants, animals, water and humans.

The noon-hour club, a partnership between the Bertrand Creek Enhancement Society, Shortreed Community Elementary School and Langley Environmental Partners Society has seen the students accomplish a number of activities.

In April, students planted over 80 native trees and shrubs at the newly constructed Creekside Nature Trail on 28 Avenue, beside Bertrand Creek. In May, students removed three large garbage bags of trash from their schoolyard, in conjunction with Pitch-In Canada's annual litter control week.

"It is important to involve youth in activities that raise their awareness of our dependence on the natural environment," said coordinator Nichole Marples. "Living in an urban area we begin to feel separated from nature, often leading to a lack of appreciation of the biodiversity of our community. The EcoTigers is a perfect way to teach students about their natural world."

Appendix B

Rivers Day on Sunday

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Sept. 24 will mark the 20th Annual BC Rivers Day. On the last Sunday in September, a series of locally-planned events take place across the province.

This year, the Township of Langley and Langley Environmental Partners Society (LEPS) are working together to expand the local Rivers Day celebrations into a week-long educational adventure. Township and LEPS staff will visit a number of local schools to give presentations. Some of the topics that will be covered include water science, conservation, and ecology.

The week of activities began Monday and culminates in the Township of Langley Rivers Day Festival which will be held at Williams Park (238 Street, south of 68 Avenue) on Sept. 24 between 11 a.m. and 4 p.m.

Educational displays, activities, entertainment, and prizes will be offered. It's on rain or shine.

Help rid Langley of 'dangerous alien'

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Editor: Thank you very much for the timely and educational article about the invasion of aliens in the Langley area: namely, the American bullfrog (The Times, August 6). The situation is dire, and we are impressed by the care and attention given to the issue by your paper.

Langley Environmental Partners Society (LEPS) is compiling a database of locations throughout the Township of Langley where these bullfrogs have been sighted. If members of the public have observed bullfrogs in Langley, we urge them to note the location or address and then contact us at lepsgen@tol.bc.ca or call 533-6054 to pass along the information.

Your reward will be the satisfaction of contributing to efforts to rid Langley of this dangerous alien!

Leanne Leith
wildlife coordinato
LEP

TIMES AUGUST 16/00

Interest overwhelming

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Editor: Langley Environmental Partners Society (LEPS) would like to thank the many residents who have called us to report sightings of the invasive American bullfrog. The response to our recent letter was so overwhelming that we haven't even finished returning all of the calls yet!

The number and nature of the phone calls we received made it apparent that local landowners want and need more information about identifying bullfrogs and about the options available to them for controlling bullfrogs on their properties. Over the next months, we will continue to compile this information and send it to interested residents.

Anyone who would like to receive this information is welcome to contact us at 533-6054 to add their name to the mailing list. LEPS will keep all recipients apprised of developments relating to bullfrogs within the region and [illegible] tunities to become directly involved in control efforts.

Given the extent and range of bullfrog sightings in the Township of Langley, LEPS would encourage the development of a municipal-wide control strategy. If you are concerned about the continued proliferation of this invasive species, please contact your local politicians.

Leanne Leith,
wildlife coordinator,
Langley Environmental
tners Society

Appendix B

■ Environment

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Dirty work needs help

LEPS wants you!

Langley Environmental Partners Society is seeking volunteers to assist them with in-stream habitat restoration projects on the Little Campbell River, Bertrand Creek, Cave Creek, and Orchard Creek, within Langley Township.

The projects will be done between mid-August 15 and mid-September.

This year's projects include:

— bank erosion repair and spawning habitat restoration (culvert replacement, riffle installation) on Orchard Creek

— spawning channel restoration on a tributary of the Little Campbell River

— construction of a fishway holding pool (increasing size/depth of holding pool) on Cave Creek

— riffle installation and bank erosion repair on Bertrand Creek

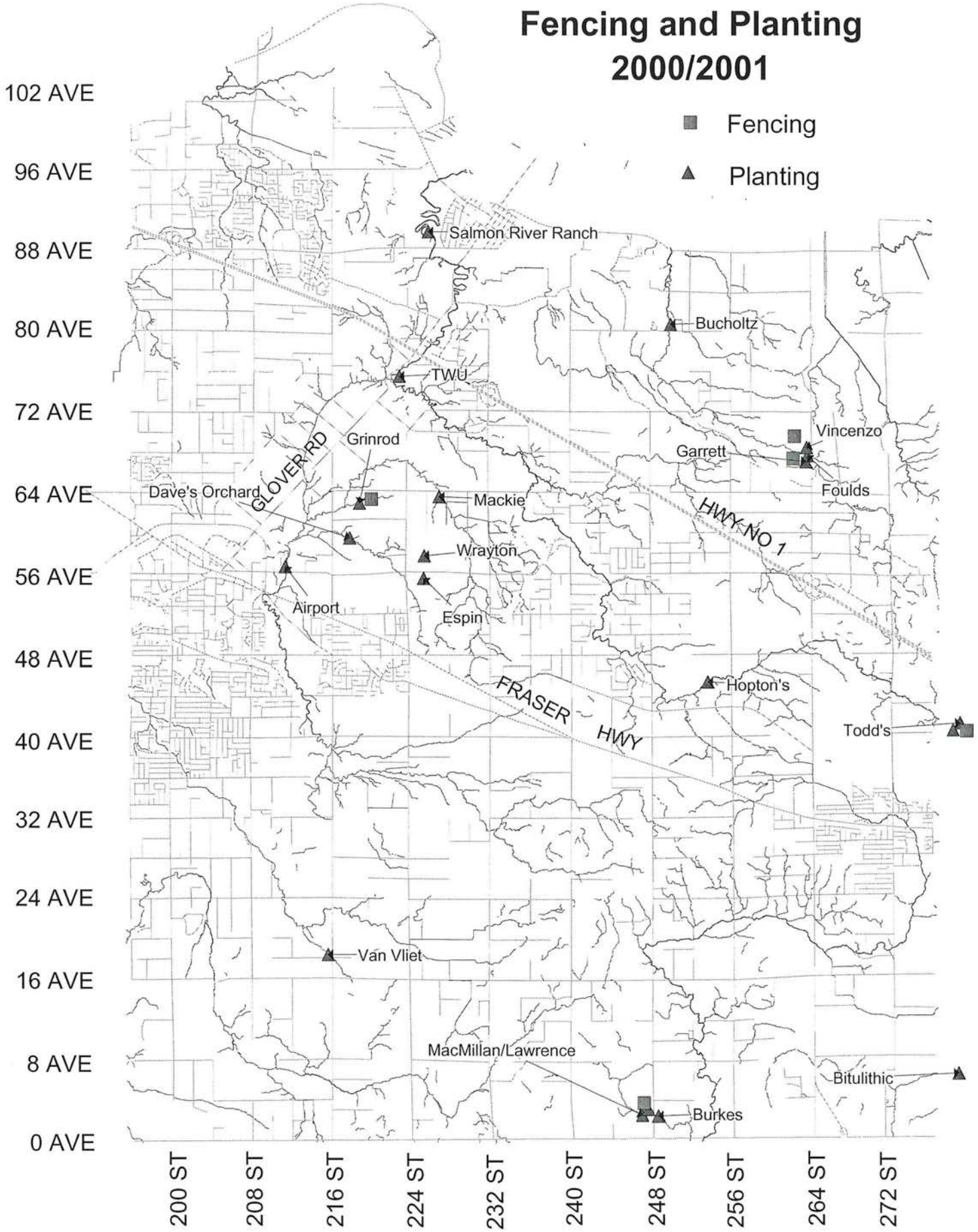
> *Be comfortable getting really dirty and wet.*

Opportunities for volunteering are available Monday through Friday, 8 a.m. to 4:30 p.m.

"Good candidates will have their own gumboots, hip waders and raingear, experience working in the outdoors, possible fisheries experience or a keen desire to learn, strong interest in the environment, a good attitude, and also must be comfortable getting really dirty and wet!" said LEPS Volunteer Coordinator Nichole Marples.

To [illegible] Marples at 533-6054 or at

Appendix C


Fencing and Planting
2000/2001
Fencing
Planting
102 AVE
96 AVE
88 AVE
80 AVE
72 AVE
64 AVE
56 AVE
48 AVE
40 AVE
32 AVE
24 AVE
16 AVE
8 AVE
0 AVE
200 ST
208 ST
216 ST
224 ST
232 ST
240 ST
248 ST
256 ST
264 ST
272 ST
Salmon River Ranch
Bucholtz
TWU
Grinrod
GLOVER RD
Vincenzo
Garrett
Foulds
Dave's Orchard
Mackie
HWY NO 1
Wrayton
Airport
Espin
Hopton's
FRASER HWY
Todd's
Van Vliet
MacMillan/Lawrence
Bitulithic
Burkes

Langley Watershed Restoration Projects
Project Status as of August 31, 2000

Instream Restoration - several potential habitat restoration sites were identified, landowner contact conducted, the sites were prioritized, site plans drawn up and permit applications sent in. Construction commenced during the fisheries window with the restoration crew, supervisor, project manager and environmental monitor.

Bertrand Creek Restoration Projects Financials Rec'd.

Cave Creek Site 1 (Burke property)
Constructed a rock (rip rap) weir at the outlet of a large culvert (~3.0 m diameter) crossing. The primary purpose of this action was to ease access through the culvert for upstream migrating coho during peak floods by raising the level of the plunge pool at the culvert outlet. The secondary purpose of this action was to increase the size and depth of the pool below the culvert for the over-summer rearing period for juvenile coho salmon. Sections of this creek are typically dry during the summer, with flows restricted to underground between pools. The pool level was raised a minimum of 0.6 m.

Cave Creek Site 2 (MacMillan property)
A holding pool was excavated below last year's fishway project, to give upstream migrating coho salmon a staging area before passing through the fishway. The pool size was increased in size from 2 X 3 X 0.6 m to 8 X 12 X 1.2 m and vegetative cover was enhanced. Secondary actions of this project included removing old seine net, deposited circa. 1950 as fill to create an agricultural dam, and covering exposed portions of the remaining net with synthetic geotextile to ensure juveniles going over the spillway do not get caught in the netting. Banks were rebuilt with material excavated from the pool and stabilized using a combination of rip rap and vegetative methods (willow staking). MELP staff (John Summers) joined us on site during work.

Orchard Creek Bank Erosion Repair and Spawning Habitat Restoration New proposal rec'd.
Plans for this site were drawn up and approved, but not implemented, due to legal issues that arose between the landowner and the Township of Langley. Plans included removal of a culvert impeding fish passage and replacement with a fish friendly design, bank and bed stabilization, and livestock exclusion fencing and revegetation.

Note: Alternative sites, also high priority for fish and riparian habitat restoration, have been identified. Verbal approval has been obtained from HRSEP, pending submission of a revised budget. See Nicomekl Fencing/Riparian Restoration project description.

LCR Tributary Spawning Channel Restoration (Campbell Valley Regional Park) Financials Rec'd
A series of log deflectors, boulder clusters and wing deflectors were constructed in this straight, uniform channel. At its confluence with the mainstem, two root wads were anchored to the bank. The primary purpose of this series of actions was to increase pool depths, re-sort bed materials, and generally add diversity to the channel. The channel is used by coho salmon for spawning and rearing. Educational values are high at this site as the area adjacent to the park

is lightly populated (semi-rural), and the households in the area have expressed interest in the welfare of this small stream running alongside the Campbell Valley Regional Park.

Fencing/Planting – Work is scheduled to commence after the fisheries window. Planting will occur during the fall and winter. Financial Rec'd.

Stream Inventory – Stream surveys (SHIM) were conducted along the upper portions of the Financial Rec'd
Little Campbell River mainstem during the summer months. The headwater tributaries will be surveyed once the fall rains begin so as to ensure that no tributaries are missed in the inventory.

Community Involvement – This summer LEPS revived the membership of the Yorkson Financial Rec'd
Watershed Stewardship Committee, a local volunteer group that formed to tackle some of the urban stream issues in their watershed and to promote stewardship and public awareness. The active membership increased from approximately 8 to 35 members who are getting involved in stream clean-ups, water quality testing, tree-planting, signage and other projects.
Similarily, this fall LEPS will hold a carefully planned public meeting in the watersheds area of West, East and Nathan Creeks of Northeast Langley. Brochures will be sent out to all watershed residents, and treeplanting events have been planned. The local elementary will host the meeting at their school.
LEPS has also conducted tours with farmers who are seeking more information about our Fisheries/Agricultural Stewardship Program. The tours give them a realistic view of what our fencing or instream restoration projects entail and are very successful for gaining support.
LEPS is also planning to host a series of stewardship meetings regarding the future of development and how the volunteer stewardship groups can get involved.

Nicomekl Fencing/Riparian Restoration project

The sites are as follows:

Orchard Creek (Nicomekl) – The following sites have have excellent rearing habitat for coho, but suffer from poor water quality and denuded riparian area:

- 5994 216th St. – 820m of stream length and 5m wide riparian buffer area will be restored with native plant species.
- 22605 56th Ave. (250m length, 12m riparian buffer width).

Nicomekl mainstem - 21936 64th Ave.

- This site also has issues of poor water quality and lack of riparian vegetation. 580m will be fenced off from livestock, and a 5-12m riparian buffer width will be restored with native plant species. This section of the Nicomekl has excellent rearing habitat for coho as well as potential for spawning

Budget is as follows:

Wages Project Manager @ 21/hr + MERC's	$ 4,044
Project Supervisor @ 17/hr + MERC's	1,361
Crew (3) @ 13/hr +MERC's	4,100
Plants, protection, materials	8,472
Fence supplies	6,243
Transportation ($.36/km)	200
Administration/overhead (5%)	1,221
Total	**$ 25,641**

Same as original orchard creek restoration.

Langley Watershed Restoration Projects
Project Status as of November 30, 2000

Instream Restoration – Final reports as well as the environmental monitor's reports have been completed and sent in to the DFO and MELP. We have been monitoring the stability and functioning of the work conducted in the summer. All projects seem to have been successful. The water flows in the Little Campbell spawning channel were still too low last month (due to low base flows this fall), but we will continue to monitor all sites into the future.

Note: $3445 still remains from the Bertrand Creek restoration budget, due to more inkind donations than we had anticipated. LEPS would like to propose that this surplus be spent on rock, construction supplies and tools for maintenance of past projects.

Fencing/Planting – Fencing and planting work was completed on the following properties:

- 5994 – 216 St. 820m of stream length, 5m wide riparian buffer planted.
- 22605 – 56 Ave. 250m stream length, 12m wide riparian buffer planted.
- 21936 – 64 Ave. 580m of stream length fenced off from livestock access, 5-12m wide riparian buffer planted.

These sites were restored with full cooperation from landowners on agricultural land who have willingly participated in our landowner stewardship program. As well, many volunteers assisted in the planting, including Myert Corp from Abbotsford, boy scouts, and students. HRSEP funds also helped us to complete 2 fencing and riparian planting projects on West Creek mainstem where it crosses 256th Ave., protecting and restoring 1.6km of sensitive salmon habitat that had been seriously degraded by cattle access.

Stream Inventory – With the onset of rains in November, the stream survey crew conducted SHIM surveys of the headwater tributaries of the Little Campbell River. Due to low precipitation levels this fall, the surveys have not yet been completed. To date, the crew has surveyed approximately 20km of the Little Campbell with this year's HRSEP funds. In addition, SHIM surveys of West Creek have been partially funded with HRSEP funds.

Community Involvement – The local community stewardship groups continue to plan events with the support from LEPS staff. Numerous treeplanting sessions and public education projects have involved the public. LEPS also hosted a stewardship meeting regarding the future of development in the Langley area, attended by approximately 35 people.
The public meeting held in the Northeast area of Langley was very successful, resulting in the formation of a new community stewardship group. They have held their third meeting, have already drawn up a work plan and are excited to work with LEPS to restore and protect the streams in their area.

Langley Watershed Restoration Projects
Project Status as of March 31, 2001

Instream Restoration – The majority of instream work was completed by November 30, 2000 with only minor adjustment occurring after that date. The sites were monitored monthly to note any changes related to water level fluctuations. Some of the riprap was rearranged at Cave Creek Site 2 (MacMillan property) to allow easier fish passage. This project was successful as mature salmon were spotted upstream of the project site. The water level at the Little Campbell spawning channel rose to allow spawning in December/January. Several pairs of coho salmon used this channel, which functioned exceptionally well during higher flows. Overall, the instream projects were very successful and will be maintained and monitored to ensure long term stability.

Fencing/Planting – Fencing and planting work was completed on the following properties, which is in addition to our HRSEP agreement:

- 3987 LeFeuvre. 300m of stream length fenced off from livestock access, 4-6m wide riparian buffer planted.
- 6823 264th. 40m of stream length, 3m wide riparian buffer planted; 150m of stream length fenced off from livestock access.
- 21515 18th ave. 190m of stream length, 3 – 5 m wide riparian buffer planted.
- 7600 Glover Road. 100m of stream length, 10 m wide riparian buffer planted

The restoration of the above sites involved a number of volunteers to help assist with planting and fencing. These volunteers included boy scouts, guides, college students, CCP students and others. The landowners participated in our landowner stewardship program and some were actively involved with the restoration itself. A total of ~3000 plants were planted in restoration sites since November of 2000, totaling close to 9000 plants for the entire 2000/1 season.

Stream Inventory- Due to the dry weather this winter the head water surveys of the Little Campbell River were delayed until there was sufficient water flow in the creeks. Since the last reporting period (Dec. 1) 10.5km of the head waters have been surveyed. This year the crew has surveyed a total of 30.5km of the Little Campbell River with the HRSEP funds. In addition, the 70km of SHIM surveys conducted on West Creek have been partially funded with HRSEP funds.

Community Involvement- The stewardship coordinators continued to assist volunteer groups in Yorkson, Bertrand, Salmon, Little Campbell, West Creeks, and Nathan. Streamkeepers workshops were offered for school groups in Abbortsford, Langley, and Surrey. The website was completed and will act as a resource for community groups. LEPS began signage for wetland and riparian zones for the Langley trails. Furthermore, LEPS had an open house, involving a tour and presentation for agency and Township staff.