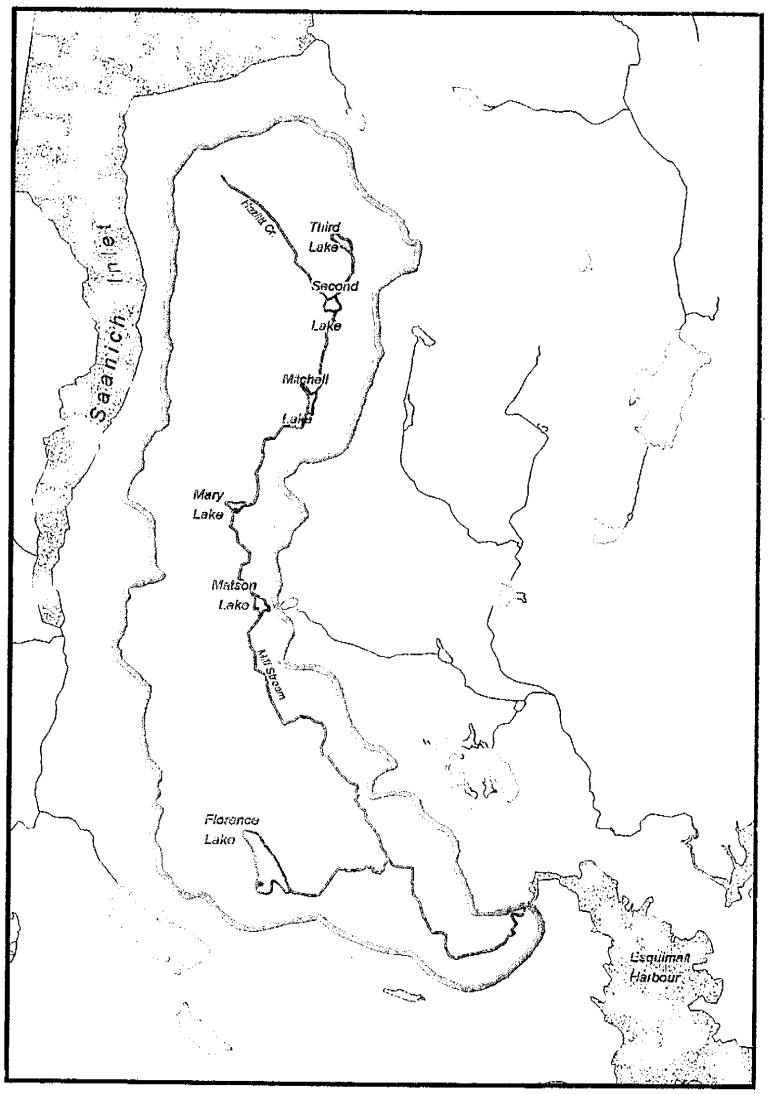
MILLSTREAM WATERSHED MANAGEMENT PLAN



Developed by

Millstream Watershed Management Forum

June 1999

SUMMARY

The Millstream Watershed is located in the Capital Regional District (CRD), extending from the Gowlland Range in the District of Highlands, south through the District of Langford and City of Colwood, to the shores of Esquimalt Harbour in the Town of View Royal. As part of a Watershed Management Strategy endorsed by the CRD Environment Committee, the Millstream Watershed Management Forum was created to develop the Millstream Watershed Management Plan. The Forum consisted of 24 members, including representatives from residents associations, the development community, environmental groups, landowners, the school district, municipal planning and engineering departments, the regional district, senior governments, and BC Hydro.

The Forum reviewed the findings of the Millstream Watershed Assessment (SHIP 1996), confirmed the key threats and challenges to maintaining a healthy watershed, and prepared the following Watershed Management Plan to address these issues. Good watershed management can result in fiscal, health, safety, recreational and ecological benefits. Actions in one part of the watershed may have impacts elsewhere, so the Forum emphasized the need for an integrated and coordinated approach.

The Forum developed the following vision for the Millstream Watershed:

"The Millstream Watershed sustains and enhances a healthy environment for plants, animals, and people"

The vision is supported by six goals for watershed management:

Goal 1: Landowners, residents, community groups, and businesses will understand and support stewardship of the watershed

Goal 2 Municipalities, the CRD, and provincial and federal governments will develop and use regulatory and management tools to improve the health of the watershed.

Goal 3: Water flows will be managed to optimize groundwater recharge and summer flows, and minimize flood damage, while maintaining the natural integrity of the watercourse.

Goal 4: Surface and ground water quality will be protected from human impacts

Goal 5: The Watershed will contain healthy aquatic ecosystems to support fish, wildlife and biodiversity.

Goal 6: Native flora and fauna will be protected and restored throughout the watershed, wherever feasible.

The Forum developed an Action Plan for meeting these goals, including 17 objectives and 65 specific actions. To facilitate implementation, the Plan identifies a lead agency and contact person, support agencies, resources needed to undertake each action, timeline of when the action should occur, and potential sources of funding and other resources. The Plan categorizes the actions into Existing Actions (7 actions), Program Amendments (21 actions), New Actions (35 actions), and Actions that Need a Lead Agency (2 actions). Actions that Need a Lead Agency are important for meeting the goals of the Plan, but lack an agency for implementing them. These actions could be implemented if a lead agency can be found. The Plan also includes a schedule and estimate of resources required for Plan implementation.

The Forum acknowledges that some actions are more crucial than others to attaining the Plan's vision. Through a priority-setting exercise, the Forum identified the following top twelve priority actions:

1 Prohibit building or filling in floodplains (2B7).
2 Incorporate environmental reviews into development permits (2B2).
3 Amend bylaws to protect wetlands (2B6).
4 Inventory and map ecological values (5A1).
5 Adopt open-stream policy (5A4).
6 Conduct landowner contact program[1] (1B1).
7 Establish riparian zones and sensitive natural habitats as development permit areas (2B1).
8 Compile inventory of mapping and data products (2A1).
9 Allocate water for fish in MELP water allocation plan (3B3).
10 Adopt stormwater management bylaws (2B9).
11 Identify and repair failing septic tank and field systems (4C2).
12 Ensure no net loss of fish habitat (5A3).

The Forum was established to develop the Plan. Having completed the Plan, the Forum is now dissolved. Implementation of Plan actions will be the responsibility of the lead agencies identified in the Plan. The Forum recommends that a Millstream Watershed Management Steering Committee be struck to replace the Forum and coordinate Plan implementation. The Steering Committee should include representatives from environmental groups, the school district, residents, the development community, each municipality, and the Ministry of Environment, Lands and Parks.

[1] This action should be proceeded by another action: "Prepare a display and pamphlets about the Millstream Watershed and its management..."

Millstream Watershed Management Plan

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ACKNOWLEDGEMENTS

This Plan was developed by the Millstream Watershed Management Forum. Robyn Wark of Westland Resource Group and Julia Roberts of Roberts Environmental Services facilitated the Millstream Watershed Management Planning process and prepared the Plan. The consultants would like to thank Rob Miller of CRD Environmental Services Group for his work in coordinating this project and promoting watershed management in the region, and SHIP Environmental Consultants Ltd. for preparing the initial Millstream Watershed Assessment (SHIP 1996).

We commend the efforts of the Millstream Watershed Management Forum for the time, energy, enthusiasm, and expertise that they contributed to creating this plan. The Forum members were:

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Marlene Caskey (Bill Hubbard, alternate)	MELP, Fish and Wildlife, Vancouver Island Region	Herman Rebneris	Cottage Grove Developments Ltd. Urban Development Institute
Michelle Choma	Belmont Senior Secondary School	John Roe	Veins of Life Watershed Society
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Susan Loney	Coalition of Langford Residents	Mike vander Linden	District of Langford, Engineering
Peter McCully	Department of Fisheries and Oceans, Goldstream Volunteer Salmonid Enhancement Association	Sonja Zupanec	Victoria Natural History Society

ABBREVIATIONS

BMPs	Best Management Practices
CC	Camosun College
CDC	Conservation Data Centre of Ministry of Environment, Lands and Parks
CHBA	Canadian Home Builders Association
CHR	Capital Health Region
CLR	Coalition of Langford Residents
Comm Assn	Community Associations
CRD ESG	Capital Regional District Environmental Services Group
CRD Parks	Capital Regional District Parks Department
CRD RPS	Capital Regional District Regional Planning Services
DFO	Department of Fisheries and Oceans
Env. Canada	Environment Canada
FFL	Friends of Fork Lake
GBEI	Georgia Basin Ecosystem Initiative
GVSEA	Goldstream Volunteer Salmonid Enhancement Association
HAT	Habitat Acquisition Trust
HCTF	Habitat Conservation Trust Fund
HDCA	Highland District Community Association
MELP	Ministry of Environment, Lands and Parks
MMA	Ministry of Municipal Affairs
MoTH	Ministry of Transportation and Highways
NGOs	Non-governmental organizations (e.g. community groups)
OCP	Official Community Plan
PACs	Parent Advisory Committees
PCC	Provincial Capital Commission
PEP	Provincial Emergency Program
PSF	Pacific Salmon Foundation
PSFed	Pacific Streamkeepers Federation
RNSP	Restoration of Natural Systems Program, University of Victoria
RRU	Royal Roads University
SD#62	School District # 62, Sooke
SEI	Sensitive Ecosystems Inventory
TLC	The Land Conservancy
UDI	Urban Development Institute
USHP	Urban Salmon Habitat Program
UVic	University of Victoria
VHS-NPG	Victoria Horticulture Society Native Plant Group
VNHS	Victoria Natural History Society
VOLWS	Veins of Life Watershed Society
VRNHAG	View Royal Natural Habitat Action Group
WSC	Water Survey Canada
WSF	Watership Foundation

GLOSSARY

Best Management Practices - measures, methods, or practices that humans can use to prevent water pollution from human activities

Floodplain - flat land bordering a river or stream over which flood waters will spread. The size of a floodplain depends on the volume of water and is usually described in terms of the flood size; e.g. a 50 year flood plain is the land covered by the largest flood that would occur once within a 50 year period, as estimated from historic stream flow records.

Nonpoint source pollution - pollution of water, air, or soil that originates from a widespread area rather than a single source; e.g. road runoff, runoff from farm fields, air pollution from motor vehicles.

Point source pollution - pollution of water, air or soil that originates from a discrete, identifiable source such as a pipe, tank or ditch.

Riparian zone - the land next to a stream, lake, pond, spring, or wetland where the soil is moist and the plants are specially adapted to wet conditions. The riparian zone has an affect on and is influenced by the adjacent aquatic ecosystem.

Sensitive ecosystem - a natural area that includes landforms, vegetation, or animal habitats that are unlikely to survive disturbance or that are rare in the region, province or country.

Sensitive natural habitat - largely undisturbed site or area that provides conditions in which native organisms (plants and/or animals) thrive. Disruptions to the site or area would reduce or eliminate its ability to support those organisms.

Stream channel - a discernable waterway that continuously or periodically contains moving water within a defined bed or banks.

Watercourse - all the stream channels of various sizes found within a watershed.

Water quality pond - a specially designed pond that captures runoff from a paved or urbanized area and allows sediment to settle out of the water before it is released to a stream.

Watershed - an area of land draining water, organic matter, dissolved nutrients, and sediments into a lake or stream.

1.0 INTRODUCTION

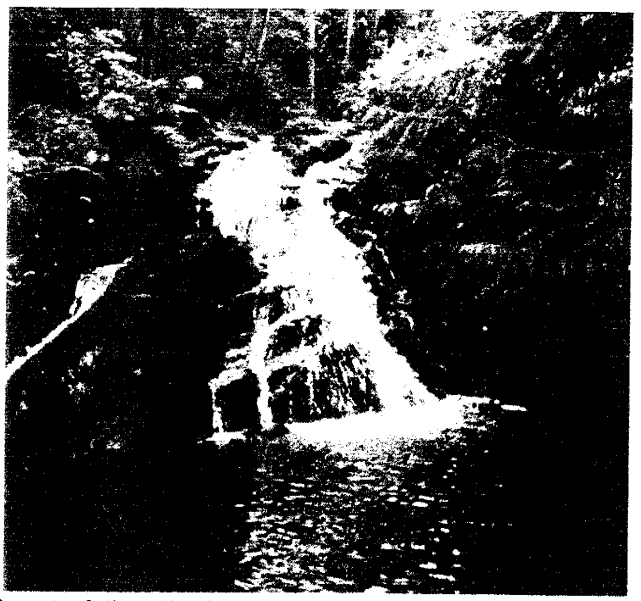
The Millstream Watershed Management Plan was developed in the spring of 1999, by a Forum of 24 representatives who live and work in the watershed, including residents, community groups, developers, and all levels of government. In developing the Plan, the Forum emphasized that good watershed management requires an integrated and coordinated approach. Actions in one part of the watershed will have impacts elsewhere.

As human activities continue and change within the watershed, management and planning practices must ensure that water quality in Millstream is maintained, property damage from flooding and erosion is avoided, and aquatic and terrestrial habitat is protected, rather than requiring expensive restoration efforts in the future.

The Forum was convened by the Capital Regional District, which also assembled and published this document presenting the Forum's work. Now that the watershed management plan has been prepared, the real challenges begin – obtaining the commitment, funding, and dedication of effort needed to implement the plan, and to achieve the Forum's vision of a watershed that can accommodate human uses while protecting its natural values.

1.1 Introduction to the Millstream Watershed

The Millstream Watershed is located near the centre of the Capital Regional District on southern Vancouver Island. The watershed drains an area of about 26 km^2 that extends from the scenic Gowlland Range to the shores of Esquimalt Harbour. The upper 60% of the watershed lies in the District of Highlands. Most of the lower 40% of the watershed is in the District of Langford. Small portions of the watershed near the mouth of Millstream Creek are in the City of Colwood and the Town of View Royal (Figure 1).



A waterfall on the lower reaches of Millstream Creek. The Colwood - Langford border runs along the stream channel.

The Millstream Watershed contains a varied landscape shaped by the retreat of the glaciers about 12,000 years ago, including rocky outcrops and hills, and lowland lakes and wetlands. The stream channels vary immensely and include two small canyons, at least eight cascades, and five waterfalls.

The upper watershed, within the District of Highlands, is mostly rural with scattered houses, home businesses, and hobby farms. The public can enjoy views of the forests and lakes of the watershed from hiking trails in Gowlland-Tod Provincial Park, Lone Tree Hill Regional Park and Mount Work Regional Park.

Lake Ida Ann. There are seven lakes (Ida Ann, Florence, Matson, Mary, First, Second, and Third) and at least 15 ponds in the watershed. Most lakes and ponds are located on private land.

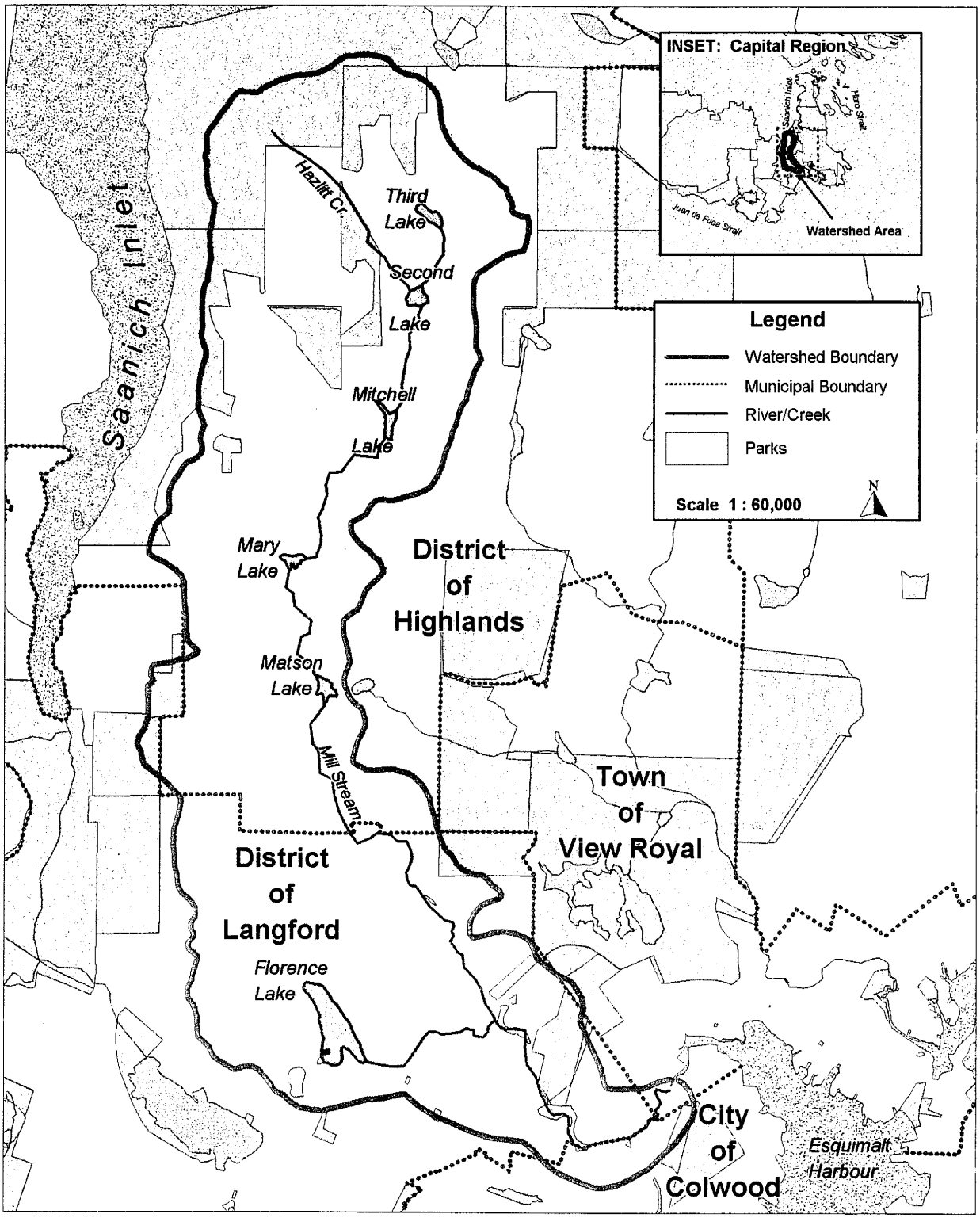
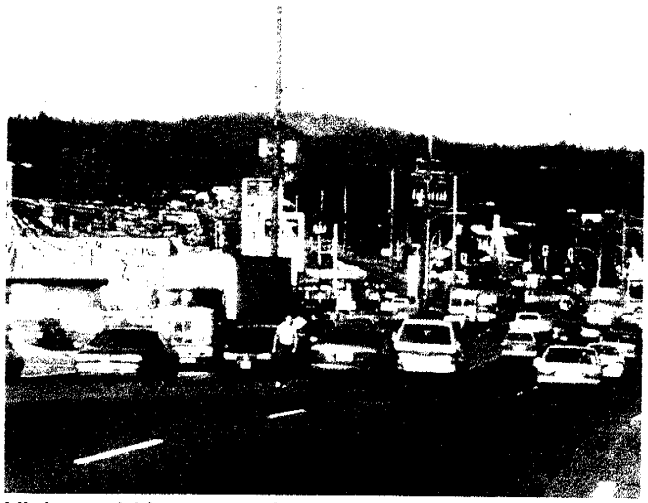


Figure 1: Jurisdictions in the Millstream Watershed



Highway 14A crosses the lower reaches of Millstream Watershed. Runoff from urban development and roads can impact stream water quality and flows.

The lower watershed in Langford, Colwood, and View Royal is mostly urbanized and includes residential, institutional, commercial, and light industrial land uses. The Trans Canada Highway, Highway 14A, and the Esquimalt and Nanaimo Railway pass through the lower watershed.

Small parcels of agricultural land remain on the north side of Millstream Creek near its mouth. Mill Hill Regional Park protects the southwest slope of Mill Hill. Municipal leave strips and pocket parks provide a green belt along the banks of Millstream Creek.

The Millstream Watershed includes a variety of ecosystems ranging from cedar-swordfern and skunk cabbage communities to dry rocky outcrops with Garry oak and arbutus. The Millstream Watershed provides habitat for birds, fish, and other wildlife. Bald eagles and turkey vultures circle the hill tops, while great blue herons stalk their prey in the shallows of ponds and slow moving streams.

Resident cutthroat trout live in Millstream Creek, and rainbow trout and small mouth bass are found in some of the upper lakes. In recent years coho salmon have been introduced to the lower reaches of Millstream Creek. Large mammals such as black bear, black-tail deer, cougar, otter, and racoon roam throughout the watershed.

Dry rocky outcrop with arbutus in Gowlland Tod Park in the upper reaches of the Watershed.

Rip-rap along Millstream Creek. Riparian vegetation along the Creek provides habitat, shade, and nutrition for fish and wildlife. In some parts of the Creek, however, engineers have placed rip-rap along the banks to prevent bank erosion, and protect property close to the bank. Future developments should be set well back from the top of the bank so that rip-rapping is unnecessary. Stormwater management should ensure that development does not increase peak stream flows, and culverts should be appropriately sized.

The health of waterways in the Millstream Watershed is strongly linked to activities on land. For example, clearing and paving land for subdivisions can increase runoff to the creeks causing erosion and flooding. Contaminated runoff from streets, parking lots, and farms as well as failures of septic tank and field systems can affect water quality in Millstream Creek and its tributaries. The human population throughout the watershed will increase as lands are developed in coming years.

Protecting the health of the Millstream Watershed requires good land and water use practices by all jurisdictions, residents, and landowners in the Watershed.

The Millstream Watershed Management Plan was developed by a 24-member Forum of residents, government agencies, and non-governmental organizations who live or work in the watershed. The Plan includes a vision, goals, and objectives for the watershed and a detailed work plan to protect and improve watershed health.

Future development should be planned and constructed in a sensitive manner to limit impacts on the watershed.

1.2 Watershed Management

A watershed is an area of land that drains precipitation into a common river system (Figure 2). Land in a watershed may be used for many different purposes (or functions), including homes, commercial and industrial development, recreational areas, road systems, and fish and wildlife habitat. Activities in one part of a watershed often affect other parts of the watershed. For example, filling a wetland in the upper watershed may increase the rate of runoff in the lower watershed.

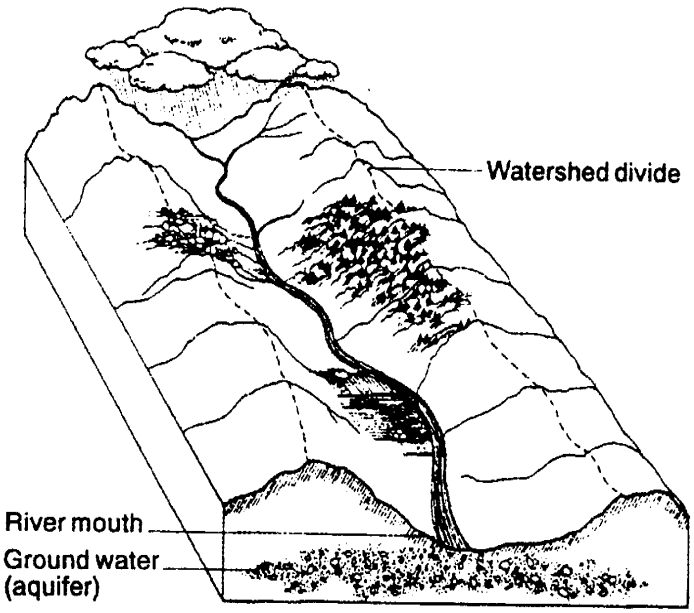


Figure 2. Diagrammatic representation of a watershed
Source: Terrene Institute. 1993.

Two **key principles** of watershed management are:

Functional Integration - managing one function of the watershed should not harm other functions of the watershed.

Spatial Integration - management in one part of the watershed should not harm other parts of the watershed.

The **benefits of good watershed management** include:

- protection of property from flooding and erosion,
- protection of water quality for drinking or swimming,
- financial savings by preventing water quality degradation and flood damage that are expensive to mitigate,
- protection of natural areas, green space, and habitats for fish and wildlife,
- preservation of aesthetic values that enhance property values, and
- improved recreational opportunities.

A watershed management approach to planning is especially valuable where several municipalities are managing land in a watershed. The watershed planning process provides a venue for coordinating management and ensuring that activities in one jurisdiction do not have negative impacts in another jurisdiction.

1.3 CRD Watershed Management Strategy

The CRD has been involved in stormwater quality management since 1983 and was identified as having a coordinating role for stormwater quality management in the 1992 Core Stage 2 Liquid Waste Management Plan (LWMP). Other components of the CRD stormwater quality program include stormwater discharge surveys, public involvement, and promotion of Best Management Practices (BMPs) to protect stormwater and water courses.

In November 1997, the CRD Environment Committee endorsed a Watershed Management Strategy consisting of the six steps outlined below. (The Millstream Watershed Management Plan is part of Step 3.)

Step 1. Prioritize watersheds in the CRD. Completed for the watersheds in the Core Liquid Waste Management Plan area (SHIP, June, 1997).

Step 2. Prepare watershed assessments. Completed for three watersheds, the Millstream Watershed (SHIP, 1996), the Craigflower Watershed (SHIP, 1997), and the Goldstream Watershed (SHIP, 1999).

The Millstream Watershed Assessment included mapping the aquatic features of the watershed, assessing the present condition of the watershed, identifying risks to the natural resources of the watershed, and presenting options for addressing those risks. The key concerns found during the study centred on stormwater management, water storage, low flows, water quality, and protection of sensitive natural habitats including riparian zones. The study recommended that the jurisdictions involved in the watershed jointly develop a "cooperative approach to zoning and the management of runoff". The authors of the study stated that "the result of inaction will be the slow but steady decline of the aquatic resources of the Millstream drainage".

Step 3. Compile options and develop watershed management plans. In 1998, the 26-member Craigflower Watershed Management Forum met four times over six months to prepare the Craigflower Watershed Management Plan. The Millstream Watershed Management Forum was convened in April, 1999 to develop a Watershed Management Plan for the Millstream Watershed.

Step 4. Obtain political approval of the plan. Municipalities and the CRD Environment Committee approved and endorsed the Craigflower Watershed Management Plan in May, 1999.

Step 5. Implement the watershed management plan. Implementation of the Craigflower Plan has begun under the guidance of the Craigflower Watershed Management Steering Committee. Some actions in the Millstream Watershed Management Plan are already being implemented by Millstream Forum members.

Step 6. Monitor and report on progress. To be completed.

1.4 Ongoing Work in the Watershed

Although formal watershed management planning is a fairly new activity for governments and NGOs working in the Millstream Watershed, several agencies and groups are already setting standards and completing projects that are beneficial to the watershed.

The Vancouver Island Highway Project (VIHP) completed in 1997 used innovative stormwater management techniques, including a water quality pond near the highway crossing of Millstream Creek to collect road runoff and allow sediments to settle out before water drains into the Creek. Catch basins filter sediment and oil from road runoff before it enters the Creek, and are cleaned regularly by maintenance staff from MoTH and the District of Langford.

Langford and View Royal both adopted Master Drainage or Stormwater Management Plans, with Langford developing a hydrologic model of the Millstream to help engineers design appropriate stormwater management techniques. All four municipalities have designated riparian areas as development permit areas, Langford has developed a formal Development Information Approval Process, and the Highlands Official Community Plan (OCP) includes a variety of policies specifically designed to protect aquatic systems, including:

- building and septic tank setbacks of 30 m from the high water mark of lakes and streams,
- no draining, dredging, infilling or dumping of materials in water features,
- no increase in peak surface runoff from development.

The CRD in conjunction with Colwood, Langford, and View Royal completed the Western Communities Trunk Sewer in 1997, to ensure adequate disposal of sewage from existing and proposed developments. For example, Langford connected the Phelps subdivision to the trunk sewer, thereby eliminating an aging sewage treatment plant that discharged inadequately treated sewage to Millstream Creek.

The Goldstream Volunteer Salmonid Enhancement Association (GVSEA) has been working for several years to introduce coho salmon to Millstream Creek. The creek has some excellent rearing habitat, but is not used by native salmon because a series of waterfalls near the mouth of the creek impede access from the sea. Coho reared in Millstream from fry planted by GVSEA have migrated to the ocean and returned to the creek mouth after four years. Volunteers with GVSEA have carried the returning fish over the falls to spawning grounds. In the summer of 1998, a fish ladder was constructed to allow the fish to bypass the falls.

BC Hydro uses "environmentally sensitive" weed control methods on their rights of way, to minimize impacts on aquatic systems. Many community groups throughout the watershed have participated in habitat inventory, parks and trails planning, and advisory environment committees for municipal planning.

Watershed management planning in the Millstream Watershed benefits from other studies and planning processes. The Sensitive Ecosystems Inventory (Environment Canada & MELP, 1997), the Regional Green/Blue Spaces Strategy (CRD Parks and PCC, 1996), and CRD Parks Plans have provided valuable information on natural habitats and strategies for protection. The ongoing Regional Growth Strategy in the CRD has confirmed that principles such as managing and balancing growth and environmental protection are core regional values, and is seeking a strategy to ensure that these principles are implemented in the CRD over the next 25 years.

These and other similar efforts all contribute to the health of the watershed. The purpose of watershed management planning is to coordinate and expand on these efforts to realize maximum benefit to the watershed.

2.0 MILLSTREAM WATERSHED MANAGEMENT PLANNING PROCESS

The Millstream Watershed Management Plan was developed by the 24-member, multi-stakeholder Millstream Watershed Management Forum over the course of three intensive workshops (see Acknowledgement section for Forum membership). During the workshops, participants:

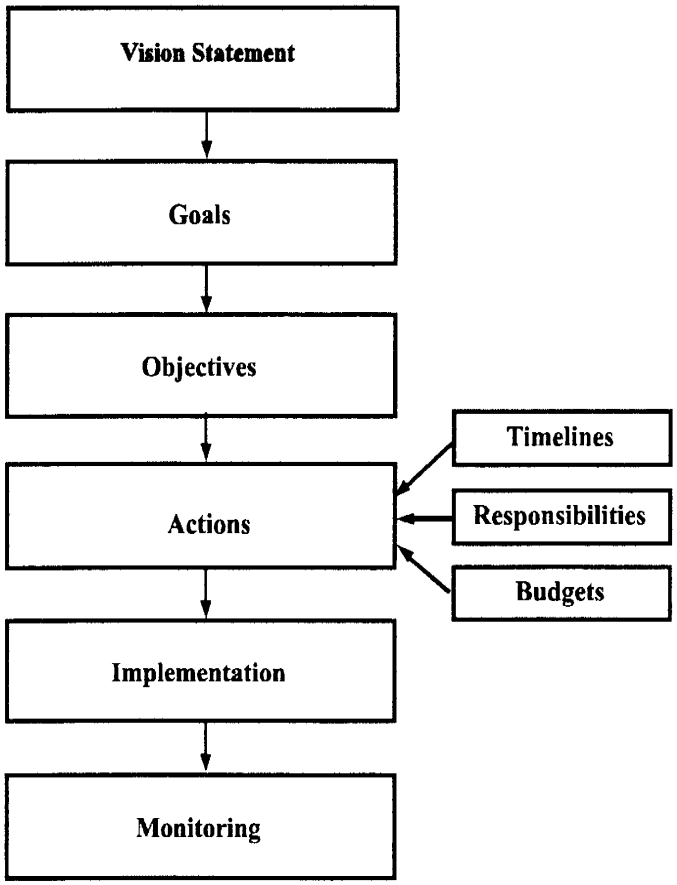
- identified key watershed management issues facing the Millstream Watershed (see Appendix A);
- toured the Watershed to review and confirm findings from the Millstream Watershed Assessment (SHIP 1996);
- developed a vision, goals, and objectives for improving the health of the watershed;
- used the Millstream Watershed Management Toolkit (Westland 1996), the Craigflower Watershed Management Plan (Westland 1998), and their own ideas to create a detailed action plan, with actions for meeting each objective;
- identified lead and support agencies for each action, plus a timeline, estimated budgetary and staff requirements, and suggested sources of funding;
- priorized actions in order of importance for implementation; and
- outlined processes for plan implementation and plan approval.

The Plan that resulted from these workshops is presented in the following section.

3.0 WATERSHED MANAGEMENT PLAN

The Millstream Watershed Management Plan contains six major elements as shown in Figure 3.

Figure 3. The Millstream Watershed Management Plan



- **Vision Statement** provides overall direction for developing the other sections of the plan.
- **Goals** state desired outcomes for six major topics of concern identified by the Forum.
- **Objectives** expand on the Goals by providing a number of desired outcomes that will contribute to achieving each goal.
- **Actions** are the means by which the Objectives will be met. Each Action within the plan is accompanied by a timeline, responsible organization and contact person, and estimate of resources required for implementation.

- **Implementation** of each action will occur through the many groups and agencies participating in the Forum. The lead agencies, identified in the plan, will coordinate implementation of each specific action.

- **Monitoring** is necessary to ensure that (a) the Plan is implemented and (b) the Forum learns whether the actions are achieving the plan's goals. Is water quality improving? Is Millstream supporting healthy fish stocks? Is native vegetation and wildlife habitat restored throughout the watershed? If we are not achieving plan goals, the agencies may need to adapt the plan, changing scheduling or altering or adding actions. Monitoring strategies are therefore built into the implementation section of the Plan.

3.1 Vision for the Millstream Watershed

The Millstream Watershed Management Forum developed the following vision statement for the watershed:

Vision for the Millstream Watershed

The Millstream Watershed sustains and enhances a healthy environment for plants, animals, and people.

3.2 Goals and Objectives

The Forum identified the following goals and objectives for watershed management.

Goal 1. **Landowners, residents, community groups and businesses will understand and support stewardship of the watershed.**

- **Objective 1A** Provide public education about the Millstream Watershed, and the value of responsible watershed management.
- **Objective 1B** Work co-operatively with landowners, residents, community groups and businesses to improve stewardship of the watershed.
- **Objective 1C** Develop and publicize current Best Management Practices for activities occurring in the watershed.

Goal 2. **Municipalities, the CRD, and provincial and federal governments will develop and use regulatory and management tools to improve the health of the watershed.**

- **Objective 2A** Assess watershed implications of existing plans and bylaws.
- **Objective 2B** Adopt and enforce regulatory tools to improve development patterns and management practices for protecting the watershed.
- **Objective 2C** Use non-regulatory tools including tax incentives, growth management tools, and best management practices to encourage watershed stewardship by landowners.

Goal 3. **Water flows will be managed to optimize groundwater recharge and summer flows, and minimize flood damage, while maintaining the natural integrity of the watercourse.**

Objective 3A Collect water quantity data for flow management.

Objective 3B Protect and improve the water storage capability of the watershed.

Objective 3C Promote stormwater management that emphasizes infiltration and detention and minimize impervious surfaces to ensure no increase in peak flows.

Objective 3D Set all new development back from the floodplain, watercourse, and waterbodies.

Goal 4. **Surface and ground water quality will be protected from human impacts.**

Objective 4A Integrate and expand water quality monitoring programs, and set water quality objectives.

Objective 4B Ensure that stormwater quality is maintained and improved in the watershed.

Objective 4C Minimize point and non-point sources of pollution.

Goal 5. **The Watershed will contain healthy aquatic ecosystems to support fish, wildlife and biodiversity.**

Objective 5A Maintain aquatic life and habitat, including riparian zones and wetlands, and enhance and restore them, wherever feasible.

Objective 5B Ensure adequate water flows to support native fish populations.

Goal 6. **Native flora and fauna will be protected and restored throughout the watershed, wherever feasible.**

Objective 6A Restore native vegetation in areas where it has been removed or degraded.

Objective 6B Identify and protect natural terrestrial ecosystems.

3.3 Action Plan

3.3.1 Top Twelve Priority Actions

The Forum recognizes that some actions are more crucial than others to attaining the Plan's vision and goals. As all actions cannot not be undertaken immediately, Forum members completed a priority-setting exercise to provide guidance in allocating resources during Plan implementation. The exercise and the resulting ranking of all the actions are shown in Appendix B.

The twelve most important items that emerged from the priority-setting exercise are listed below.

1 Prohibit building or filling in floodplains (2B7).
2 Incorporate environmental reviews into development permits (2B2).
3 Amend bylaws to protect wetlands (2B6).
4 Inventory and map ecological values (5A1).
5 Adopt open-stream policy (5A4).
6 Conduct landowner contact program[2] (1B1).
7 Establish riparian zones and sensitive natural habitats as development permit areas (2B1).
8 Compile inventory of mapping and data products (2A1).
9 Allocate water for fish in MELP water allocation plan (3B3).
10 Adopt stormwater management bylaws (2B9).
11 Identify and repair failing septic tank and field systems (4C2).
12 Ensure no net loss of fish habitat (5A3).

3.3.2 Detailed Work Plan

Each of the actions proposed by the Forum were designed to meet a specific goal and related objective. Effective watershed management has multiple benefits, so some actions contribute to more than one goal. For example, installing pollutant traps should improve water quality. A benefit of improved water quality will be better fish habitat and healthier fish populations. Hence, this single action could contribute to meeting goals 4 and 5. In general, each action in the detailed work plan is listed under the goal and objective for which it was originally proposed. When an action will contribute to meeting an additional goal and objective, it is also listed in the work plan as a "related action" under the additional goal and objective.

Each of the actions will be undertaken by a lead agency in cooperation with support agencies. A contact person has been designated for each lead agency. Once the Millstream Watershed

[2] This action should be proceeded by another action: "Prepare a display and pamphlets about the Millstream Watershed and its management..."

Management Plan has been approved by municipal councils and the CRD Environment Committee, the contact persons will initiate the actions in accordance with the timeline in Section 3.4. The support agencies will be approached to provide technical advice, access to relevant information, permission to enter private lands, or other assistance.

The Forum estimated resources required to implement each action. Financial resources are estimated at being "Low" (under $10,000), "Medium" ($10,000 to $50,000), or High (over $50,000). In some instances, staff or volunteer time are required rather than funds. Potential sources of staff time, volunteer time, or funding are suggested for each action. If funding is not available, some of the actions may be delayed.

In the list of actions that follows, the status of each action is indicated with one of the following labels:

Existing Action	An action that is already underway with coordination and funding arranged by a lead agency and contact person.
Program Amendment	An action that requires changes to an existing program. The lead agency already manages the program, and changes can occur during regular reviews of the program. Staff time rather than funding are usually required, but some program amendments will require funding for legal or consulting fees.
New Action	An action that requires new funding and has been assigned a lead agency and contact person.
Needs Lead	An action that requires new funding and lacks a lead agency and contact person.

Goal 1
Landowners, residents, community groups and businesses will understand and support stewardship of the watershed.

Objective 1A Provide public education about the Millstream Watershed and the value of responsible watershed management.

Action 1. Involve school children who live in the watershed in the storm drain marking program.

Program Amendment

Lead Agency:	Schools, youth groups, service clubs	**Support Agencies:**	Don Lowen, DFO Education Coordinator, Streamkeepers, HCTF, PSF
Contact:	Teachers, youth group leaders	**Timing:**	April - October, annually
Resources:	Staff time, volunteer time	**Potential Sources:**	WSF

Action 2. Hold Millstream Watershed Festival on Rivers Day, the last Sunday in September.

New Action

Lead Agency:	Stewart Bender	**Support Agencies:**	Comm Assn, CRD-ESG, SD#62, VOLWS, HCTF, PSF
Contact:	Stewart Bender	**Timing:**	June - September, annually
Resources:	Volunteer time	**Potential Sources:**	corporate sponsorship, media partnership

Action 3. Develop a Millstream Watershed Web-site with links to Streamkeepers, CRD, and MELP web-sites.

New Action

Lead Agency:	VOLWS	**Support Agencies:**	Colwood, Highlands, Langford, MELP, RRU, SD#62, View Royal
Contact:	John Roe	**Timing:**	March, 2000
Resources:	Volunteer time, Internet access	**Potential Sources:**	VOLWS

Action 4. Provide a Millstream component for existing DFO-sponsored school programs such as "Salmonids in the Classroom"and "Gently Down the Stream".

Program Amendment

Lead Agency:	DFO, SD #62	**Support Agencies:**	Don Loewen, Education Coordinator DFO, GVSEA, RRU, VOLWS
Contact:	Don Loewen, Ted Waring, Michelle Choma	**Timing:**	July - August, 2000
Resources:	Low	**Potential Sources:**	School PACs, PSF, WSF

Action 5. Develop an Environmental Education and Stream Ecology program for high school students.

Existing Action

Lead Agency:	SD#62	**Support Agencies:**	Don Lowen, Education Coordinator DFO, GVSEA, VOLWS, PSF, HCTF.
Contact:	Michelle Choma	**Timing:**	September - May, annually, starting 2000
Resources:	Low	**Potential Sources:**	School PACs

Action 6. Prepare a display and pamphlets about the Millstream Watershed and residential best management practices adapting existing materials as appropriate. Include topics such as:

New Action

- siting and maintenance of septic systems,
- maintaining riparian vegetation to stabilize banks and filter sediment from runoff,
- maintaining and restoring native vegetation and habitat for native animals.

Use the display and distribute pamphlets at Rivers Day, community events, schools, community centres, libraries, and local government offices.

Lead Agency:	Michael Bocking	**Support Agencies:**	Comm Assn, CRD, DFO, MELP, PCC, RRU, SD#62, SEI
Contact:	Michael Bocking	**Timing:**	September - December, 1999
Resources:	Low	**Potential Sources:**	BMP Compendium on MELP website, Pollution Probe - "Care and Feeding of Septic Tanks", corporate sponsorship, CanWest Mall, PCC, Canada Trust, Pacific Coast Savings, CRD

Objective 1B Work co-operatively with landowners, residents, community groups and businesses to improve stewardship of the watershed.

Action 1. Contact landowners directly to discuss stewardship of the watershed.

New Action

Lead Agency:	VOLWS & GVSEA	**Support Agencies:**	Comm Assn, HAT, RRU, SD#62 work exp. Project.
Contact:	John Roe	**Timing:**	May - July, 2000
Resources:	Low	**Potential Sources:**	

Action 2. Provide articles or inserts to community newspapers, organization newsletters and trade journals on techniques for improving watershed management. Topics could include:

New Action

- Minimizing impervious surfaces,
- Maintaining riparian vegetation,
- Proper waste disposal practices,
- Fish restoration efforts in Millstream,
- Sensitive natural habitat protection,
- Native vegetation,
- Land trusts and covenants as tools for ecosystem protection.

Lead Agency:	VOLWS	**Support Agencies:**	MELP, CLR, HDCA, VRNHAG, CRD, RRU, SD#62, Comm Assn.
Contact:	John Roe	**Timing:**	Monthly from March, 2000
Resources:	Low	**Potential Sources:**	

Action 3. Create Streamkeepers and Wetland Keepers groups in Millstream Watershed. Groups can help protect aquatic areas by collecting data about habitats, insects, and fish, checking water quality, and planting native trees and shrubs.

New Action

Lead Agency:	SD#62, VOLWS	**Support Agencies:**	DFO, Comm Assn, Esq. Anglers, GVSEA, RRU, local businesses, youth groups, schools.
Contact:	Michelle, Choma, John Roe	**Timing:**	June, 2000, then ongoing
Resources:	Low	**Potential Sources:**	Jennifer Sutherst teaches Streamkeepers locally Wetland Keepers available through Langara College

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Action 4. Hold community field days to remove garbage from streams and re-plant stream banks.

New Action

Lead Agency:	HDCA, VRNHAG	**Support Agencies:**	Comm Assn, RRU, SD#62, SIASS, VOLWS, FFL, Schools
Contact:	Marcie McLean, Andria Tetlow	**Timing:**	July 15 - September 15, annually
Resources:	volunteer time	**Potential Sources:**	Corporate sponsorship; e.g. Costco, Home Depot

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Action 5. Educate the public and local government staff to alert the Provincial Emergency Program to major incidents affecting water quality and fish stocks (e.g. spills, increased sedimentation).

New Action

Lead Agency:	VOLWS	**Support Agencies:**	Comm Assn, Streamkeepers, MELP, Municipalities
Contact:	John Roe	**Timing:**	Ongoing
Resources:	Low, volunteer time	**Potential Sources:**	

Action 6. Develop a database for government and non-government agencies, identifying resources and responsibilities regarding watershed management.

New Action

Lead Agency:	PCC	**Support Agencies:**	MELP, CRD, VOLWS
Contact:	Dave Morris	**Timing:**	May - August, 2000
Resources:	Staff & volunteer time computer hardware & software	**Potential Sources:**	

Action 7. Improve communications between regulators and landowners, business, and developers, including a program to recognize green businesses.

New Action

Lead Agency:	UDI, CHBA, Chamber of Commerce	**Support Agencies:**	Colwood, CRD, Highlands, Langford, View Royal, Comm Assns, VOLWS, REB.
Contact:	Herman Rebneris	**Timing:**	January - June, 2000, then ongoing
Resources:	Low	**Potential Sources:**	

Objective 1C Develop and publicize current Best Management Practices for activities occurring in the watershed.

Action 1. Collect existing Best Management Practices (BMPs) for agriculture; construction; logging; water use; stream side parks management; and industrial, commercial, and institutional land uses. Adapt the BMPs as needed to suit the Millstream Watershed

New Action

Lead Agency:	VOLWS	**Support Agencies:**	CRD-ESG, MELP Water Quality, Municipalities, CRD Parks
Contact:	John Roe	**Timing:**	September - December, 2000
Resources:	Low, staff time, volunteer time	**Potential Sources:**	BMP Compendium on MELP Website

Action 2. Distribute BMP materials from Actions 1A6 and 1C1 to watershed landowners, residents, and business operators, and discuss implementation. Municipalities with in-house engineering expertise should discuss site-specific implementation of stormwater best management practices, including on-site infiltration of runoff (e.g., roof runoff to lawn), and vegetated swales (e.g., roadside ditches) for drainage.

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	VOLWS, CRD Parks, News Group, Times Colonist
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden, Barbara Avery	**Timing:**	January - March, 2001, then ongoing
Resources:	Staff time	**Potential Sources:**	

Action 3. Modify government and utility company public works policies for road and utility design, to avoid sensitive natural habitats, to minimize impacts of stream crossings, and to avoid impacts on leave areas.

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal, BC Hydro	**Support Agencies:**	MELP
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden, Tony Queen	**Timing:**	May - August, 2000
Resources:	Staff time	**Potential Sources:**	Municipal budgets

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Action 4. Provide training programs for developers and consultants about *Land Development Guidelines for the Protection of Aquatic Habitat*, and stormwater management and design.

New Action

Lead Agency:	UDI , CHBA	**Support Agencies:**	MELP, PCC, CRD, DFO, Colwood, Highlands, Langford, View Royal, VOLWS
Contact:	Herman Rebneris	**Timing:**	January - March, 2000
Resources:	Medium	**Potential Sources:**	

Goal 2

Municipalities, the CRD, and provincial and federal governments will develop and use regulatory and management tools to improve the health of the watershed.

Objective 2A Assess watershed implications of existing plans and bylaws.

Action 1. Compile and circulate an inventory of mapping and data products available for the watershed.

New Action

Lead Agency:	VOLWS	**Support Agencies:**	Colwood, DFO, Highlands, Langford, MELP, View Royal
Contact:	John Roe	**Timing:**	September - December, 1999
Resources:	Low, staff & volunteer time	**Potential Sources:**	DFO, E-Team

Action 2. Review Official Community Plans and other bylaws to ensure consistency with the Millstream Watershed Management Plan.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	Comm. Assns., MELP, Millstream Steering Comm.
Contact:	Simon Lawrence, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	January - March, 2000
Resources:	Low, Staff time	**Potential Sources:**	

Objective 2B Adopt and enforce regulatory tools to improve development patterns and management practices for protecting the watershed.

Action 1. Establish all lands adjacent to riparian zones, wetlands, waterbodies, and sensitive natural habitats as development permit areas for environmental protection.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MELP
Contact:	Simon Lawrence, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	July - December, 2000
Resources:	Low, Staff time	**Potential Sources:**	

Action 2. Incorporate environmental reviews into development permit processes and require pre-construction and follow-up site visits to discuss and monitor BMPs and land development practices. Use financial incentives to ensure compliance with environmental protection measures.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	DFO, MELP
Contact:	Jon Munn, Helen Lockhart, Kevin Key, Rob Buchan, Michael vander Linden, Barbara Avery	**Timing:**	July - December, 2000, then ongoing
Resources:	Medium	**Potential Sources:**	

Action 3. Review forthcoming provincial streamside directives and incorporate into community plans and bylaws.

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MMA, MELP
Contact:	Jon Munn, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	July, 2000 - June, 2001
Resources:	Low, Staff time	**Potential Sources:**	

Action 4. Adopt or amend tree-cutting bylaws or equivalent development permit designations to prevent tree-cutting and other vegetation removal in riparian zones.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	DFO, MELP, MMA
Contact:	Simon Lawrence, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	July - December, 2000
Resources:	Low	**Potential Sources:**	

Action 5. Establish an OCP policy to retain, enhance, or restore native vegetation coverage, to protect habitat, reduce water use, and reduce use of pesticides and fertilizers in the watershed.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	DFO, MELP, MMA, VOLWS
Contact:	Simon Lawrence, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	July - December, 2000
Resources:	Low	**Potential Sources:**	

Action 6. Enact or amend bylaws to protect wetlands from clearing, filling, draining, and development.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MELP
Contact:	Helen Lockhart, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	January - June, 2000
Resources:	Low, Staff time	**Potential Sources:**	

Action 7. Enact and enforce bylaws that prohibit any building or filling on the 200 year floodplains, except where it can be proved with certainty that such actions would not adversely impact water quality or flow. Require floors of all new habitable structures to be above defined flood elevation.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MELP
Contact:	Helen Lockhart, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	October - December, 2000
Resources:	Low	**Potential Sources:**	

Action 8. Incorporate applicable portions of the *Stewardship Series* and *Land Development Guidelines for the Protection of Aquatic Habitat* in OCPs, zoning and other bylaws.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	DFO, MELP
Contact:	Jon Munn, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	September - December, 2000
Resources:	Medium	**Potential Sources:**	

Action 9. Adopt, enhance, and enforce Stormwater Management Bylaws so that they are consistent with the CRD's model bylaw and incorporate appropriate sections of the new fish protection legislation to:

Program Amendment

- prohibit increases in runoff from new developments,
- prohibit pollution and obstruction of flow in watercourses and set penalties for offences.

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	CRD-ESG
Contact:	Helen Lockhart, Kevin Key, Michael vander Linden, Tony Queen.	**Timing:**	June - December, 2001
Resources:	Medium	**Potential Sources:**	

Action 10. Review environmental powers available to local governments through 1997 revisions to the Municipal Act. In consultation with residents and businesses, adopt appropriate measures into regulations to ensure sensitive development forms and practices, including:

Program Amendment

- development approval areas where a developer is required to provide environmental impact information [Section 920.1 (1)],
- dedication of natural water courses and construction of works to preserve, protect, restore or enhance natural water courses or other specified natural features [Section 920 (7) (c) and (d)],
- security deposits with development permits for protection of the natural environment [Section 925(2)],
- landscaping requirements for the preservation or restoration of the natural environment [Section 920 (7) (b) and (e)].

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	CRD, MELP, MMA
Contact:	Simon Lawrence, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	June - December, 2000
Resources:	Low	**Potential Sources:**	

Action 11. Inform municipal councils and Boards of Variance that under the new fish protection legislation in the Municipal Act a board cannot issue a variance if the board is of the opinion that the variance would adversely impact the natural environment [Section 901(2)(c)].

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MMA
Contact:	Simon Lawrence, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	September, 1999
Resources:	Low	**Potential Sources:**	

Objective 2C Use non-regulatory tools including tax incentives, growth management tools, and best management practices to encourage watershed stewardship by landowners.

Action 1. Encourage development forms that maximize natural greenspace and protect sensitive natural habitats by using tools such as clustering, density transfers, and amenity zoning.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MELP
Contact:	Jon Munn, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	March - June, 2000
Resources:	Medium	**Potential Sources:**	

Action 2. Distribute information to landowners and developers about federal tax benefits of donating lands, certified as ecologically sensitive, to municipalities or authorized conservation organizations.

New Action

Lead Agency:	HAT, TLC	**Support Agencies:**	Colwood, Highlands, Langford, Nature Conservancy of Canada, View Royal
Contact:	Land Stewardship Office (Ph. 995-2428)	**Timing:**	Fall, 1999, then ongoing
Resources:	Low	**Potential Sources:**	

Action 3. Seek conservation covenants on sensitive natural habitats and explore granting limited property tax exemptions on land that is undevelopable because it includes riparian zones, wetlands, or floodplains.

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	Land trusts, MELP, MMA
Contact:	Jon Munn, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	January, 2001, then ongoing
Resources:	Low	**Potential Sources:**	

Action 4. Investigate and promote innovative ways of funding sensitive natural habitat acquisition, including green bonds, tax credits, and development cost charges. Provide recommendations to local governments.

New Action

Lead Agency:	UDI, CHBA	**Support Agencies:**	Real Estate Board, UDI, HAT, Land Conservancy, Nature Conservancy of Canada, Municipalities
Contact:	Herman Rebneris	**Timing:**	July - December, 2001
Resources:	Low	**Potential Sources:**	

Goal 3

Water flows will be managed to optimize groundwater recharge and summer flows; and minimize flood damage, while maintaining the natural integrity of the watercourse.

Objective 3A Collect water flow data for flow management.

Action 1. Collect all historical data from stream gauges and water licenses in the watershed.

Existing Action

Lead Agency:	MELP	**Support Agencies:**	WSC
Contact:	Walter Van Bruggen	**Timing:**	Fall, 1999
Resources:	Low, staff time	**Potential Sources:**	

Action 2. Install and operate two stream gauges on Millstream Creek, at sites chosen in consultation with Water Survey of Canada and MELP Water Management.

New Action

Lead Agency:	Colwood, Highlands, Langford	**Support Agencies:**	MELP Water Mgmt, RRU, UVic, VOLWS, WSC
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden	**Timing:**	January, 2001 to December, 2002
Resources:	$10K annually	**Potential Sources:**	DFO, provincial grant applications, municipalities

Action 3 Ground truth existing hydrologic models with actual stream flow data and adapt flow management practices based on results from the model.

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MELP, UVic, RRU
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden	**Timing:**	July - December, 2003
Resources:	Low	**Potential Sources:**	Municipalities

Action 4. Inventory dams in the watershed, including size, elevation, flow control devices (if any), ownership, condition, seismic safety, and maintenance. Conduct site inspections with landowners and disseminate resulting information to the Forum.

New Action

Lead Agency:	MELP Water Mgmt	**Support Agencies:**	Landowners
Contact:	Bruno Blecic	**Timing:**	January - June, 2001
Resources:	Low	**Potential Sources:**	

Action 5. Collect data about groundwater wells in the watershed and map the well locations. Obtain aquifer mapping, if any, from MELP. Determine threats to groundwater recharge, if any.

New Action

Lead Agency:	Highlands	**Support Agencies:**	MELP Groundwater Section, UVic, RRU, SIASS, VOLWS
Contact:	Kevin Key	**Timing:**	January - June, 2001
Resources:	Low	**Potential Sources:**	

Objective 3B Protect and improve the water storage capability of the watershed.

Action 1. Identify 200 year floodplain and model the Millstream flow regime.

New Action

Lead Agency:	Colwood, Highlands, Langford	**Support Agencies:**	MELP Water Mgmt
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden	**Timing:**	July - December, 2003
Resources:	Medium	**Potential Sources:**	

Action 2. Assess and develop strategies for managing Millstream Watershed flow regime, including managing peak and low flows. Recommendations could include:

Needs Lead

- stormwater detention;
- rationalizing the sizes and elevations of culverts, especially downstream of Highway 1;
- developing flow "rule curve" with input from landowners, fisheries staff, and other stakeholders;
- developing dam maintenance protocols.

Lead Agency:		**Support Agencies:**	Municipal Engineering Staff, Landowners, MELP Water Management
Contact:		**Timing:**	July - December, 2003
Resources:	High	**Potential Sources:**	Taxation, grants to province

Action 3. Update the Millstream portion of MELP's *Saanich-Victoria Water Allocation Plan* to allocate water for fish. If there are changes in water availability in the watershed due to the eventual completion of Actions 3B.1 and 3B.2, the plan should be modified to reflect those changes.

Program Amendment

Lead Agency:	MELP Water Mgmt	**Support Agencies:**	None
Contact:	Bruno Blecic	**Timing:**	July - December, 2002
Resources:	Staff time	**Potential Sources:**	MELP Water Mgmt Budget

Objective 3C Promote stormwater management that emphasizes infiltration and detention and minimize impervious surfaces to ensure no increases in peak flows.

Action 1. Adopt engineering sign-off sheets to vouch that development will lead to zero increases in peak runoff, rates of erosion, or reductions in base flows.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	DFO, MELP
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden, Tony Queen	**Timing:**	April - June, 2000, then ongoing
Resources:	Low	**Potential Sources:**	

Action 2. Install appropriate[3] stormwater management infrastructure (e.g., pollutant traps, sand filters, detention ponds) in new developments and retrofit existing developments to reduce peak runoff and improve water quality.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, MoTH, View Royal	**Support Agencies:**	CRD, DFO, MELP
Contact:	Approving officers, Engineering staff	**Timing:**	May, 2000 - December, 2003
Resources:	High, staff time	**Potential Sources:**	Development cost charges, municipal budgets

[3] Appropriate means as determined by professional engineers, registered professional biologists, and other environmental professionals.

Action 3. Adopt a subdivision or development services bylaw and OCP policy to encourage drainage techniques that use infiltration, (e.g., ditch drainage, exfiltration drains).

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MMA
Contact:	Jon Munn, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	January - June, 2001
Resources:	Low, Staff time	**Potential Sources:**	Municipalities

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Action 4. Investigate opportunities for establishing a stormwater utility in the CRD.

New Action

Lead Agency:	VOLWS	**Support Agencies:**	MELP, RRU, UVic
Contact:	John Roe	**Timing:**	January - June, 2001
Resources:	Low	**Potential Sources:**	

Objective 3D Set all new development back from the floodplain, watercourses, and waterbodies.

Related Actions. Actions under Objective 2B are regulations that accomplish this objective.

Goal 4
Surface and ground water quality will be protected from human impacts.

Objective 4A Integrate and expand water quality monitoring programs, and set water quality objectives.

Action 1. Expand CRD's existing surface water quality monitoring and reporting in Millstream Creek. Monitoring will seek to track ambient conditions and identify points of contamination. Report findings to municipalities for follow-up.

Program Amendment

Lead Agency:	CRD-ESG	**Support Agencies:**	Municipalities, CHR, DFO, MELP, MoTH
Contact:	Rob Miller	**Timing:**	Ongoing
Resources:	Low	**Potential Sources:**	CRD-ESG

Action 2. Collect groundwater monitoring data and determine threats to groundwater quality. Make recommendations to municipalities on ways to eliminate or minimize threats to groundwater quality.

New Action

Lead Agency:	Highlands	**Support Agencies:**	MELP Groundwater Section, RRU, UVic, SIASS, VOLWS
Contact:	Kevin Key	**Timing:**	January - June, 2001, then ongoing
Resources:	Low	**Potential Sources:**	

Action 3. Follow-up water quality monitoring reports to identify and resolve sources of contamination.

Existing Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	CRD-ESG
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden, Tony Queen	**Timing:**	Ongoing
Resources:	Low, staff time	**Potential Sources:**	Municipal budgets

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Action 4 Develop and adopt water quality objectives for watercourses and waterbodies in the Millstream Watershed

New Action

Lead Agency:	Steering Committee/MELP	**Support Agencies:**	MELP, Colwood, CRD-ESG, DFO, Highlands, Langford, View Royal, VOLWS
Contact:	Ben Kangasniemi	**Timing:**	April, 2000 - March, 2001
Resources:	Low	**Potential Sources:**	Lead & support agencies

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Related Actions.

Streamkeepers (Action 1B.3) could also assist with water quality monitoring.

Information about water quality objectives and monitoring can be included in the educational materials prepared in Action 1A.2.

Objective 4B Ensure that stormwater quality is maintained and improved in the watershed.

Action 1. Monitor and maintain the effectiveness of the water quality pond near the Vancouver Island Highway crossing of Millstream Creek. Regularly clean highway catch basins that drain to Millstream Creek.

Existing Action

Lead Agency:	MoTH	**Support Agencies:**	Langford
Contact:	Dan Saari	**Timing:**	Ongoing
Resources:	Medium	**Potential Sources:**	MoTH budgets

Action 2. Ensure that municipalities implement regular maintenance programs for their stormwater infrastructure, e.g., dredge stormwater detention and retention ponds to maintain their original volumes, clean out pollutant traps. Develop and implement handling and disposal plans for solids.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	CRD-ESG, MELP
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden, Tony Queen	**Timing:**	January - June, 2000, then ongoing
Resources:	Low	**Potential Sources:**	Municipal budgets

Action 3. Monitor the effectiveness of stormwater management techniques used on specific sites for maintaining water quality and quantity. Apply findings to improving future techniques.

New Action

Lead Agency:	Colwood, Highlands, Langford	**Support Agencies:**	CRD-ESG, CC, DFO, MELP, MoTH, RRU, UVic
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden	**Timing:**	Ongoing
Resources:	Low, staff time	**Potential Sources:**	Municipal budgets

Related Actions.

Education of developers in the use of techniques from *Land Development Guidelines for Protection of Aquatic Habitat* (Actions 1C.4) and installation of appropriate stormwater management infrastructure in Action 3C.2 will improve water quality in Millstream Creek.

BMPs prepared and distributed in Actions 1C.1 and 1C.2 will educate the public about controlling sources of contamination from homes, businesses, and farms.

Objective 4C Minimize point and non-point sources of pollution.

Action 1. Conduct dye-testing to identify and correct sewer cross-connections.

New Action

Lead Agency:	VOLWS	**Support Agencies:**	Municipalities, CRD-ESG
Contact:	John Roe	**Timing:**	2000
Resources:	Low	**Potential Sources:**	

Action 2. Identify and require repair of faulty septic tank and field systems.

Existing Action

Lead Agency:	CHR	**Support Agencies:**	VOLWS, Landowners
Contact:	Environmental Health Officers	**Timing:**	Ongoing
Resources:	Staff time	**Potential Sources:**	CHR

Action 3. Encourage developers to build "maintenance reminders" into developments; e.g. if a drainage system is not cleaned regularly it will overflow onto the owner's parking lot before it impacts public property.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, MoTH, View Royal	**Support Agencies:**	None
Contact:	Helen Lockhart, Kevin Key, Mike vander Linden	**Timing:**	Ongoing
Resources:	Low, staff time	**Potential Sources:**	Municipalities

Action 4. As a condition of subdivision, rezoning, development permit, or building permit, require that all owners of private storm sewer systems register covenants ensuring that their systems will be maintained. Each covenant must include a maintenance schedule.

New Action

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	
Contact:	Simon Lawrence, Kevin Key, Rob Buchan, Barb Avery	**Timing:**	July - December, 2000, then ongoing
Resources:	Low, staff time	**Potential Sources:**	Municipal budgets

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Related Actions.

Collecting and distributing BMPs (actions 1C1 and 1C2) and adopting and maintaining stormwater quality infrastructure (action 3C.2) will help prevent non-point sources of pollution.

Goal 5
The Watershed will contain healthy aquatic ecosystems to support fish, wildlife and biodiversity.

Objective 5A — Maintain aquatic life and habitat, including riparian zones and wetlands, and enhance and restore them wherever feasible.

Action 1. Inventory and map ecological values, sensitive ecosystems, rare and endangered species within the watershed.

New Action

Lead Agency:	VNHS	**Support Agencies:**	CRD Parks, CDC, municipalities, MELP, VRNHAG, VOLWS,
Contact:	Sonia Zupanec	**Timing:**	April - September, 2000
Resources:	Medium	**Potential Sources:**	BC Hydro, EcoAction 2000, GBEI, Friends of the Environment Fund

Action 2. Enhance and restore aquatic habitat, including:

- improving access for salmon at the mouth of Millstream Creek,
- rebuilding problem culverts to allow fish passage,
- restoring riparian zones.

Existing Action

Lead Agency:	GVSEA	**Support Agencies:**	Colwood, DFO, Highlands, Langford, MELP, Comm. Assns, Streamkeepers, VNHS, VOLWS
Contact:	Peter McCully	**Timing:**	Ongoing
Resources:	Medium, volunteer time	**Potential Sources:**	

Action 3. Ensure no net loss of fish habitat during the development process.

Existing Action

Lead Agency:	DFO, Colwood, Highlands, Langford, View Royal	**Support Agencies:**	Comm Assn., Env. Advisory Comm., MELP, Landowners, VOLWS.
Contact:	Cindy Harlow, Jon Munn, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	Ongoing
Resources:	Low, Staff time	**Potential Sources:**	Lead agency budgets

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Action 4. Adopt an OCP policy that watercourses will be left open and natural, to protect habitat, and limit piping and land filling.

Program Amendment

Lead Agency:	Colwood, Highlands, Langford, View Royal	**Support Agencies:**	MELP, MoTH
Contact:	Jon Munn, Kevin Key, Rob Buchan, Barbara Avery	**Timing:**	January - June, 2000
Resources:	Low, Staff time	**Potential Sources:**	

Related Actions.

Wetland Keepers groups created under Action 1B.3 will help to protect and possibly restore wetlands.

Regulatory and management actions under Objective 2B should ensure that existing wetlands are not drained for development and remain as wildlife habitat.

Objective 5B Ensure adequate water flows to support native fish populations.

Related Actions.

Development and implementation of a flow management plan (Action 3B.2) and minimizing the impacts of development on peak flows (Actions 3C.1, 3C.2, 3C.3, and 3C.4) will all contribute to providing adequate water flows for fish.

Action 3B.3, updating of MELP's *Saanich Victoria Water Allocation Plan,* can include allocating water to maintain flows for fish.

Goal 6
Native flora and fauna will be protected and restored throughout the watershed, wherever feasible.

Objective 6A Restore native vegetation in areas where it has been removed or degraded.

Action 1. Identify areas where native vegetation has been removed or is in decline. Use SEI mapping, the *Millstream Watershed Prototype Study*, and ground truthing to provide background information for this action.

New Action

Lead Agency:	VNHS	**Support Agencies:**	CC, Colwood, Highlands, Langford, MELP-CDC, RRU, SD#62, UVic, View Royal, VOLWS, VRNHAG
Contact:	Sonja Zupanec	**Timing:**	May - October, 2000
Resources:	Low	**Potential Sources:**	BC Hydro, EcoAction 2000

Action 2. Develop and implement a restoration and replanting program on private and public property using suitable native species.

New Action

Lead Agency:	VOLWS	**Support Agencies:**	CC, CDC, RRU, SD#62, RNSP, VHS-NPG, VOLWS, VRNHAG
Contact:	John Roe	**Timing:**	January - May, 2001, then ongoing
Resources:	Medium	**Potential Sources:**	BC Hydro, EcoAction 2000

Objective 6B Identify and protect natural terrestrial ecosystems.

Action 1. Develop a management strategy for rare and endangered species (plants and wildlife) and sensitive ecosystems.

Needs Lead

Lead Agency:		**Support Agencies:**	VNHS, MELP, CRD Parks
Contact:		**Timing:**	October, 2000 - March, 2001
Resources:	Low, information from MELP about management tool	**Potential Sources:**	

Action 2 Plan parks, trails, watershed greenways, and linear parks along watercourses, choosing locations that minimize impacts to ecologically sensitive areas. Coordinate greenway and trail planning between municipalities, CRD, BC Parks and PCC.

Program Amendment

Lead Agency	Colwood, CRD Parks, Highlands, Langford, PCC, View Royal, BC Parks	**Support Agencies:**	Comm Assn, HDCA, MELP, VOLWS, VNHS, VRNHAG
Contact:	Simon Lawrence, Joel Ussery, Kevin Key, Rob Buchan, Dave Morris, Barbara Avery, Chris Kissinger	**Timing**	October, 1999 - December, 2003
Resources:	Low, staff time	**Potential Sources:**	

Related Actions.

Action 1B.2 should provide public education about protecting natural terrestrial ecosystems.

Actions 2B.1 and 2B.4 are designed to protect sensitive natural habitats during the development process.

Actions 2C.1, 2C.2, 2C.3, and 2C.4 encourage protection of sensitive natural areas through the use of growth management tools such as clustering, density transfers, conservation covenants, and tax breaks.

3.4 Timeline

The proposed timeline for all the actions in the Plan is presented in Table 1. The actions are grouped by goal. Actions are scheduled to be completed over a five year period from 1999 to the end of 2003. Existing actions are shown as continuing from the present to the end of 2003.

Table 1: Timeline for Implementation of the Millstream Watershed Management Plan

Activity Name	Start Date	Finish Date
Goal 1: Landowners, residents, community groups and businesses will understand and support stewardship of the watershed.		
1.A.1 Storm drain marking program	7/1/99	10/31/99
	4/1/00	10/31/00
	4/1/01	10/31/01
	4/1/02	10/31/02
	4/1/03	10/31/03
1.A.2 Watershed festival on Rivers Day	6/1/99	9/30/99
	6/1/00	9/30/00
	6/1/01	9/30/01
	6/1/02	9/30/02
	6/1/03	9/30/03
1.A.3 Millstream Web-site	3/1/00	3/31/00
1.A.4 DFO-sponsored school programs	7/1/00	12/31/03
1.A.5 Stream ecology school program	9/1/00	12/31/03
1.A.6 Millstream display and pamphlets	9/1/99	12/31/99
1.B.1 Landowner contact	5/1/00	7/31/00
1.B.2 Newspaper articles and inserts	3/1/00	12/31/03
1.B.3 Create Streamkeepers and Wetland Keepers groups	6/1/00	12/31/03
1.B.4 Community field days	7/15/00	9/15/00
	7/15/01	9/15/01
	7/15/02	9/15/02
	7/15/03	9/15/03
1.B.5 Educate about Provincial Emergency Program	7/1/99	1/29/03
1.B.6 Database on Watershed Management resources and responsibilities	5/1/00	8/31/00
1.B.7 Improve communications between regulators, landowners and businesses	1/1/00	12/31/03
1.C.1 Collect Best Management Practices	9/1/00	12/31/00
1.C.2 Distribute BMPs	1/1/01	12/31/03
1.C.3 Modify governmnet and utility public works policies	5/1/00	8/31/00
1.C.4 Training programs for developers	1/1/00	3/31/00

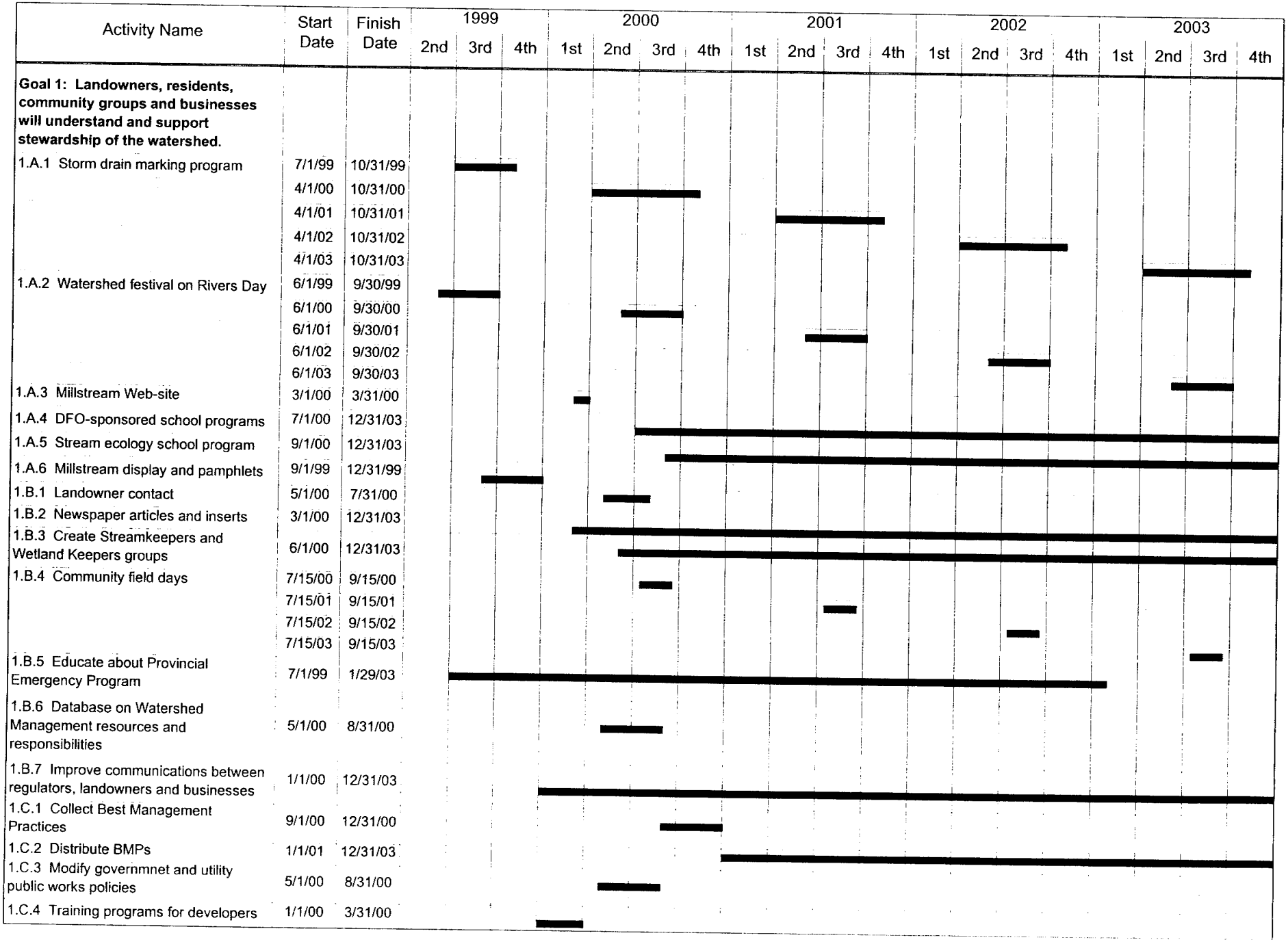

Table 1: Timeline for Implementation of the Millstream Watershed Management Plan

Activity Name	Start Date	Finish Date
Goal 2: Municipalities, the CRD, and provincial and federal governments will develop and use regulatory and management tools to improve the health of the watershed.		
2.A.1 Compile inventory of mapping and data products	9/1/99	12/31/99
2.A.2 Review Official Community Plans and other bylaws	1/1/00	3/31/00
2.B.1 Establish development permit areas	7/1/00	12/31/00
2.B.2 Incorporate environmental reviews into development permits	7/1/00	12/31/03
2.B.3 Review provincial streamside directives	7/1/00	6/30/01
2.B.4 Tree-cutting restrictions	7/1/00	12/31/00
2.B.5 OCP policy to enhance or restore native vegetation	7/1/00	12/31/00
2.B.6 Protect wetlands	1/1/00	6/30/00
2.B.7 Prohibit building or filling in floodplains	10/1/00	12/31/00
2.B.8 Land development guidelines	9/1/00	12/31/00
2.B.9 Stormwater management bylaws	6/1/01	12/31/01
2.B.10 Review environmental powers	6/1/00	12/31/00
2.B.11 Inform Board of Variance about Municipal Act amendments	9/1/99	9/30/99
2.C.1 Encourage appropriate development forms	3/1/00	12/31/03
2.C.2 Distribute information on Federal tax benefits	9/1/99	12/31/03
2.C.3 Seek conservation covenants	1/1/01	12/31/03
2.C.4 Investigate innovative funding	7/1/00	12/31/00

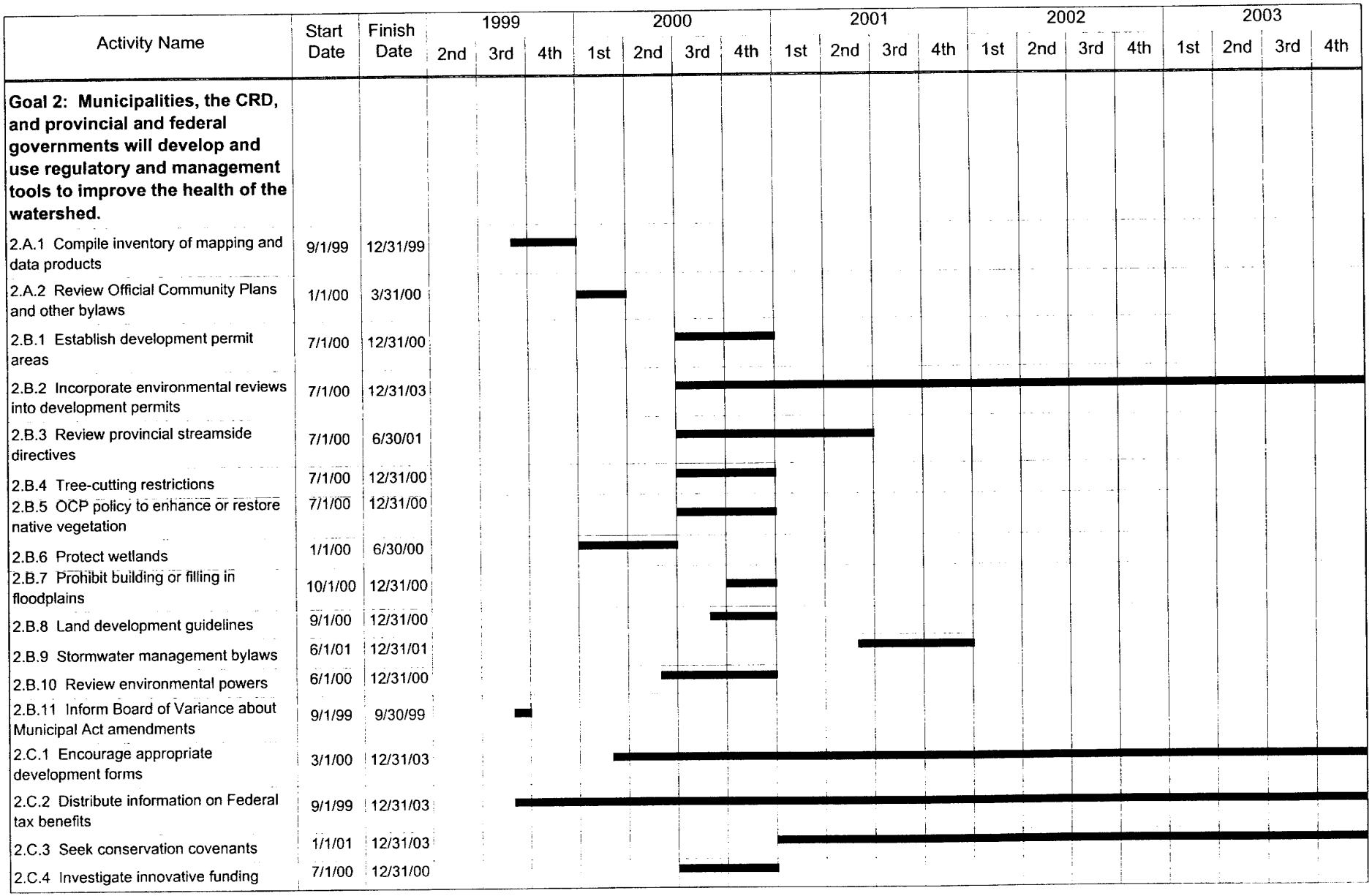

Table 1: Timeline for Implementation of the Millstream Watershed Management Plan

Activity Name	Start Date	Finish Date	1999			2000				2001				2002				2003			
			2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Goal 3: Water flows will be managed to optimize groundwate recharge and summer flows; and minimize flood damage, while maintaining the natural integrity o the watercourse.																					
3.A.1 Collect historic flow data	9/1/99	10/31/99																			
3.A.2 Install stream gauges	1/1/01	12/31/02																			
3.A.3 Ground-truth hydrologic models	7/1/03	12/31/03																			
3.A.4 Inventory and inspect dams	1/1/01	6/30/01																			
3.A.5 Groundwater data collection	1/1/01	6/30/01																			
3.B.1 Identify 200 year floodplain	7/1/03	12/31/03																			
3.B.2 Develop flow management strategies	7/1/03	12/31/03																			
3.B.3 Allocate water for fish	7/1/02	12/31/02																			
3.C.1 Adopt engineering sign-off sheets	4/1/00	12/31/03																			
3.C.2 Install stormwater management infrastructure	5/1/00	12/31/03																			
3.C.3 Encourage drainage techniques that use infiltration	1/1/01	6/30/01																			
3.C.4 Investigate options for stormwater utility	1/1/01	6/30/01																			

Table 1: Timeline for Implementation of the Millstream Watershed Management Plan

Activity Name	Start Date	Finish Date	1999			2000				2001				2002				2003			
			2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Goal 4: Surface and ground water quality will be protected from human impacts.																					
4.A.1 Surface water quality monitoring	5/1/99	12/31/03																			
4.A.2 Groundwater quality monitoring	1/1/01	12/31/03																			
4.A.3 Follow up water quality reports	4/1/99	12/31/03																			
4.A.4 Set water quality objectives	4/1/00	3/31/01																			
4.B.1 Maintain water quality pond on Highway	4/1/99	12/31/03																			
4.B.2 Maintain municipal stormwater infrastructure	1/1/00	12/31/03																			
4.B.3 Monitor effectiveness of stormwater management techniques	1/1/00	12/31/03																			
4.C.1 Conduct dye-testing	1/1/00	12/31/00																			
4.C.2 Identify and repair septic tank and field system	4/1/99	12/31/03																			
4.C.3 Build maintenance reminders into developments	8/1/99	12/31/03																			
4.C.4 Require maintenance of private storm sewers	7/1/00	12/31/03																			

Table 1: Timeline for Implementation of the Millstream Watershed Management Plan

Activity Name	Start Date	Finish Date	1999			2000				2001				2002				2003			
			2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Goal 5: Maintain aquatic life and habitat, including riparian zones and wetlands, and enhance and restore them wherever feasible.																					
5.A.1 Inventory and map ecological values	4/1/00	9/30/00																			
5.A.2 Enhance and restore aquataic habitat	4/1/99	12/31/03																			
5.A.3 Ensure no net loss of fish habitat	4/1/99	12/31/03																			
5.A.4 Adopt open-stream policy	1/1/00	6/30/00																			
Goal 6: Native flora and fauna wil be protected and restored throughout the watershed, wherever feasible.																					
6.A.1 Identify key areas of native vegetation removal	5/1/00	10/31/00																			
6.A.2 Replanting and restoration program	1/1/01	12/31/03																			
6.B.1 Management strategy for rare and endangered species	10/1/00	3/31/01																			
6.B.2 Plan parks, trails and greenways	10/1/99	12/31/03																			

3.5 Estimate of Resources Required

Table 2 provides an estimate of the new resources required to implement the Millstream Watershed Management Plan over five years. Some annual costs will continue beyond the five year planning horizon used for the estimate.

A total of 56 new actions and program amendments that require new funding are included in this estimate. The seven existing actions are already funded by ongoing programs of government or NGOs. The two actions that lack a lead agency (3B.2 and 6B.1) also lack sources of funding. However, there is time to find lead agencies and raise funds for these actions before the dates scheduled for their implementation.

Forum members estimated the approximate cost for each action, and categorized the action under one of the following three headings:

Low	less than $10,000
Medium	$10,000 to $50,000
High	more than $50,000.

Some estimates were subsequently refined through discussions with other government and agency staff.

Table 2. Estimate of Resources for the Millstream Watershed Plan

Actions		1999		2000		2001		2002		2003	
		One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual
Goal 1											
1.A.1	Storm drain marking program		L		L		L		L		L
1.A.2	Watershed festival on Rivers Day		L		L		L		L		L
1.A.3	Millstream Web-site				L		L		L		L
1.A.4	DFO-sponsored school programs				L		L		L		L
1.A.5	Stream ecology course for schools				L		L		L		L
1.A.6	Millstream display and pamphlets	L									
1.B.1	Landowner contact			L							
1.B.2	Newspaper articles and inserts				L		L		L		L
1.B.3	Create Streamkeepers and Wetland Keepers groups				L		L		L		L
1.B.4	Community field days		L		L		L		L		L
1.B.5	Educate about Provincial Emergency Program		L		L		L		L		L
1.B.6	Database on Watershed Management resources and responsibilities			L							
1.B.7	Improve communications between regulators, landowners and businesses				L		L		L		L
1.C.1	Collect Best Management Practices			L							
1.C.2	Distribute BMPs						L		L		L
1.C.3	Modify government public works policies			L							
1.C.4	Training programs for developers			L							

L - less than $10,000 M - $10,000 to $50,000 H - more than $50,000

Table 2. Estimate of Resources for the Millstream Watershed Plan

Actions		1999		2000		2001		2002		2003	
		One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual
Goal 2											
2.A.1	Compile inventory of mapping and data products	L									
2.A.2	Review Official Community Plans and other bylaws			L							
2.B.1	Establish development permit areas			L							
2.B.2	Incorporate environmental reviews into development permits.				L		L		L		L
2.B.3	Review provincial streamside directives			L		L					
2.B.4	Tree-cutting restrictions			L							
2.B.5	OCP policy to enhance or restore native vegetation			L							
2.B.6	Protect wetlands			L							
2.B.7	Prohibit building or filling in floodplains			L							
2.B.8	Land development guidelines			M							
2.B.9	Stormwater management bylaws					M					
2.B.10	Review environmental powers			L							
2.B.11	Inform Board of Variance about Municipal Act amendments	L									
2.C.1	Encourage appropriate development forms			M							
2.C.2	Distribute information on federal tax benefits		L		L		L		L		L
2.C.3	Seek conservation covenants						L		L		L
2.C.4	Investigate innovative funding					L					

L - less than $10,000 M - $10,000 to $50,000 H - more than $50,000

Table 2. Estimate of Resources for the Millstream Watershed Plan

Actions		1999		2000		2001		2002		2003	
		One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual
Goal 3											
3.A.1	Collect historical flow data	L									
3.A.2	Install stream gauges						M		M		
3.A.3	Ground-truth hydrologic models									L	
3.A.4	Inventory and inspect dams					L					
3.A.5	Groundwater data collection					L					
3.B.1	Identify 200 year floodplain									M	
3.B.2	Develop flow management strategy									H	
3.B.3	Allocate water for fish							L			
3.C.1	Adopt engineering sign-off sheets				L		L		L		L
3.C.2	Install stormwater management infrastructure				H		H		H		H
3.C.3	Encourage drainage techniques that use infiltration					L					
3.C.4	Investigate options for stormwater utility					L					
Goal 4											
4.A.1	Surface water quality monitoring		L		L		L		L		L
4.A.2	Groundwater quality monitoring						L		L		L
4.A.3	Follow-up water quality reports		L		L		L		L		L
4.A.4	Set water quality objectives				L		L				
4.B.1	Maintain water quality pond on highway		M		M		M		M		M
4.B.2	Maintain municipal stormwater infrastructure				L		L		L		L
4.B.3	Monitor effectiveness of stormwater management techniques				L		L		L		L
4.C.1	Conduct dye-testing			L							
4.C.2	Identify and repair faulty septic systems		M		M		M		M		M

L - less than $10,000 M - $10,000 to $50,000 H - more than $50,000

Table 2. Estimate of Resources for the Millstream Watershed Plan

Actions		1999		2000		2001		2002		2003	
		One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual	One Time	Annual
4.C.3	Build maintenance reminders into developments		L		L		L		L		L
4.C.4	Maintenance covenants for private storm sewers			L							
Goal 5											
5.A.1	Inventory and map ecological values			M							
5.A.2	Enhance and restore aquatic habitat		M		M		M		M		M
5.A.3	Ensure no net loss of fish habitat		L		L		L		L		L
5.A.4	Adopt open-stream policy			L							
Goal 6											
6.A.1	Identify key areas of native vegetation removal			L							
6.A.2	Replanting and restoration program						M		M		M
6.B.1	Management strategy for rare and endangered species			L		L					
6.B.2	Plan parks, trails and greenways		L		L		L		L		L

L - less than $10,000 M - $10,000 to $50,000 H - more than $50,000

3.6 Implementation

The Millstream Watershed Forum was established to develop the Millstream Watershed Management Plan. Having completed the Plan, the Forum is now dissolved, so implementation of the Plan will be the responsibility of the lead agencies identified for each action. Several organizations may be involved in the action, but the lead agency will be responsible for initiating and coordinating implementation.

The Forum recommends that a Millstream Watershed Management Steering Committee be struck to replace the Forum and coordinate Plan implementation. The roles of the Steering Committee will be to:

a. Coordinate applications for funding to support actions identified in the Plan;
b. Provide a venue for participants to collaborate on scheduling and work programs;
c. Track whether actions are implemented and whether the timeline set out in the Plan is being met;
d. Monitor whether actions are meeting the Plan vision and goals, and improving the health of the Millstream Watershed; and
e. Seek lead agencies for leaderless actions.

Monitoring should include both whether actions have been implemented, and whether the actions have led to attainment of plan vision and goals. The Steering Committee can monitor whether actions are being implemented by circulating the Status Report Sheet in Appendix C to all lead agencies. Lead agencies should complete the form, identifying the status of each action. The Steering Committee should then compile a brief Annual Status Report on Plan Implementation for circulation to Forum members.

Evaluating whether we are attaining the plan vision and goals, requires monitoring of on-the-ground conditions. Every 3 to 5 years, the Steering Committee should compile a "Health of the Watershed Summary Report" to evaluate whether the health of the watershed is improving, remaining constant, or degrading. Appendix D proposes indicators that could be used as performance measures in such a monitoring report. Indicators should be directly relevant to each goal, with reliable, ongoing, cost-effective, available data.

The Steering Committee will meet at least four times a year. The Forum recommends that the Steering Committee consist of:

- representatives from non-governmental organizations active in the watershed, including environmental groups, the school district, residents, and the development community,
- representatives from each municipality, and
- a representative from Ministry of Environment.

Although the Forum is dissolved, all members who have participated in the creation of the Millstream Watershed Management Plan will be kept up-to-date, by receiving Steering Committee reports summarizing the progress of Plan implementation.

4.0 REFERENCES

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APPENDIX A

ISSUES IN THE MILLSTREAM WATERSHED

Forum members identified the following watershed management issues in the Millstream Watershed, based on the Watershed Assessment and their own experiences working and living in the watershed.

A. Flow-related

- Increases in peak flows from future development
- Slope destablization from peak flows (property risk)
- Coordination of dam operation (14 dams)
- No future flow diversions
- Legal issues if private dams fail
- Water conservation for areas on wells - use of grey water for non-potable uses
- Potentially conflicting flow objectives (e.g., measures to meet fish objectives may conflict with wetland preservation objectives)
- Land-extensive suburban development.
- Results of building the Victoria Approaches project (runoff, loss of vegetation, blasting of hills).
- How to remediate areas with current poor stewardship practices.

B. Water Quality

- Non-point sources of pollution - e.g. run-off from roads and parking lots.
- Loss of vegetation through development reduces natural filtering and increases sedimentation.
- Erosion and sedimentation from building too close to banks.
- Protecting groundwater drinking water quality
- Different water uses have different water quality requirements (e.g., fish, drinking water, recreation)
- Historic "put-it-in-a-pipe" stormwater management.
- Potential contamination from industrial and commercial uses in Langford and low-level industry in the Highlands.

C. Fish, Wildlife, and Natural Habitat Protection

- Loss of existing fish and wildlife habitat (e.g., wetlands)
- Low flows limit fish populations
- Opportunities to enhance protect and restore biodiversity, including fish

D. Development: type, form and location

- Accommodating growth without degrading aquatic system
- Using optimum setbacks to protect naturally-functioning stream and fisheries habitat, and accommodate greenways trails.
- Ensuring no increases in peak flows
- Minimizing impervious surfaces
- Understanding anticipated levels and distribution of growth
- Using a "limits to acceptable change" approach to growth, rather than trying to set carrying capacities (i.e., identify features and values that should be protected)
- Recognizing that natural systems are dynamic.
- Identifying location of greenways and recreation opportunities
- Making more efficient use of land (no more suburban sprawl) through clustering, rezoning, and incentives.
- Adopting rules and regulations that are practical and explicitly explained at beginning of development process.
- Incorporating natural designs if stream channel is changed

E. Jurisdictional

- How can watershed management best be managed and coordinated? What organization can take responsibility for stewardship in the watershed (coordinate and ensure accountability).
- Need for comparable regulations throughout the watershed (including provincial projects)
- Many dams are unlicensed and controlled by individuals. How coordinate?
- How to enforce municipal regulatory powers (e.g. monitoring conservation covenants, dumping, or stream alterations)
- Private ownership of creek-bed and flows.
- How to deal with cumulative impacts on the watershed.

F. Public Understanding and Support

- How to increase and sustain support for watershed management
- Who should take responsibility for public education?
- How to coordinate community-based activities
- How to obtain political support for watershed management
- How to educate Councils, developers, large land owners, BCAL, MoTH and others whose decisions affect the watershed regarding improved development forms and methods of protecting stream biology and hydrology.

Studies or recent projects that could assist Millstream watershed management

- Past Watershed Management Plans (Craigflower, Bilston)
- Millstream Watershed Management Toolkit
- Municipal drainage plans (Colwood, Langford, View Royal)
- Post construction studies by Vancouver Island Highways Project
- Archival research (e.g., CRD Parks historic and archaeology studies, 1:5,000 aerial photos from early in century (Veins of Life))
- Engineering assessment and design studies (Riverside Ridge, Atkins Road – ENN line, CP Rail, West Millstream-Earsman development, Hatcher Swamp development)
- Greenways studies (CRD, VNHS)
- Sensitive Ecosystem Inventory
- Floodplain mapping (MELP)
- Streamkeepers Guide
- Land Development Guidelines
- Fish Protection Act
- School stewardship program
- DFO New Directions program
- Habitat Conservation Trust Fund
- Non-Point Source Pollution Action Plan (MELP)
- Academic studies (e.g., Royal Roads University)
- E-Team work
- Official Community Plans
- Conservation covenants
- Naturescape speakers
- BC Hydro ongoing work

APPENDIX B

PRIORITY-SETTING EXERCISE

Forum members completed a priority-setting exercise in conjunction with their review of Draft 2 of the Plan. The purpose of the exercise was to identify which of the actions in the Plan were most important to meeting the vision for the Millstream Watershed, as funding all the actions immediately would be unrealistic.

Forum members were provided with a list of all the proposed actions and asked to rate each action on its role in meeting the Plan vision and goals. Actions were rated as:

- Crucial,
- Important,
- Not Useful, or
- Don't Know

Responses were received from 13 of the 24 Forum members. The responses were evaluated by assigning points to each response as follows:

Rating	Points
Crucial	5
Important	3
Not Useful	1
Don't Know	0

The total points for each action was calculated and normalized using the formula:

Total Points = © x 5 + I x 3 + NU) / © + I + NU)

where: C was the number of members who considered the action crucial,
I was the number of members who considered the action important,
NU was the number of members who considered the action not useful.

The actions were then sorted from highest to lowest total points. The action with the highest total points was ranked 1(most important) the action with the second highest total points was ranked 2, and so on. The action with the lowest total points was considered least important. The results of the priority-setting exercise are shown in Table B1.

After this priority-setting exercise was completed, further discussions in Workshop 3 lead to some actions being dropped, combined, or split. The revised actions were then renumbered. The revised numbers are used throughout the Plan. Column one of Table B1 shows the revised numbers and provides a cross-reference between the numbers used in the priority-setting exercise and the numbers used elsewhere in the Plan.

Table B1 Results of priority-setting exercise - June 21, 1999

Action No.	Action	Ratings and Points				Total Points	Ranking
		Crucial	Important	Not Useful	Don't Know		
		5	3	1	0		
2.B.7	Prohibit building or filling in floodplains	10	3	0	0	4.54	1
2.B.2	Incorporate environmental reviews into development permits.	9	3	0	0	4.5	2
2.B.6	Amend bylaws and protect wetlands	9	4	0	0	4.38	3
5.A.1	Inventory and map ecological values	8	5	0	0	4.23	4
5.A.4	Adopt open-stream policy	6	4	0	2	4.2	5
1.B.1	Conduct landowner contact program	7	5	0	0	4.17	6
2.B.1	Establish development permit areas	7	6	0	0	4.08	7
2.A.1	Compile inventory of mapping and data products	6	6	0	1	4	8
3.B.3	Allocate water for fish	6	6	0	1	4	9
2.B.9	Stormwater management bylaws	6	7	0	0	3.92	10
4.C.2	Identify and repair septic tank and field system	6	7	0	0	3.92	11
5.A.3	Ensure no net loss of fish habitat	6	7	0	0	3.92	12
2.C.1	Encourage appropriate development forms	3	4	0	5	3.86	13
4.A.3	Follow up water quality reports	5	7	0	1	3.83	14
6.A.1	Identify key areas of native vegetation removal	5	7	0	0	3.83	15
3.C.2	Install stormwater management infrastructure	4	6	0	2	3.8	16
1.B.3	Create Streamkeepers and Wetland Keepers groups	5	8	0	0	3.77	17
1.B.7	Improve communications between regulators, landowners and businesses	5	8	0	0	3.77	18
2.B.8	Land development guidelines	5	8	0	0	3.77	19
2.B.8	Newspaper articles and inserts	4	8	0	0	3.67	20
4.A.1	Surface water quality monitoring	4	8	0	1	3.67	21
6.B.2	Plan parks, trails and greenways	4	8	0	1	3.67	22
3.B.1	Identify 200 year floodplain	4	9	0	0	3.62	23
2.B.10	Review environmental powers	3	7	0	3	3.6	24
4.B.2	Maintain municipal stormwater infrastructure	3	7	0	2	3.6	25

Action No.	Action	Ratings and Points				Total Points	Ranking
		Crucial	Important	Not Useful	Don't Know		
		5	3	1	0		
1.A.3	Millstream Web-site	3	8	0	2	3.55	26
1.B.4	Community field days	3	8	0	2	3.55	27
1.C.3	Modify government public works policies	3	9	0	1	3.5	28
1.C.4	Training programs for developers	3	9	0	0	3.5	29
2.A.2	Review Official Community Plans and other bylaws	3	9	0	0	3.5	30
3.A.1	Collect historic flow data	2	6	0	4	3.5	31
3.B.2	Develop flow management strategies	4	7	1	0	3.5	32
4.B.3	Monitor effectiveness of stormwater management techniques	3	9	0	0	3.5	33
5.A.2	Enhance and restore aquatic habitat	3	9	0	0	3.5	34
6.A.2	Replanting and restoration program	4	7	1	0	3.5	35
1.B.6	Database on Watershed Management resources and responsibilities	3	10	0	0	3.46	36
1.C.2	Distribute BMPs	3	10	0	0	3.46	37
3.C.3	Encourage drainage techniques that use infiltration	3	10	0	0	3.46	38
6.B.1	Management strategy for rare and endangered species	4	8	1	0	3.46	39
3.A.3	Ground-truth hydrologic models	2	7	0	4	3.44	40
3.C.1	Adopt engineering sign-off sheets	2	7	0	3	3.44	41
1.B.5	Educate about Provincial Emergency Program	3	6	1	2	3.4	42
2.C.4	Investigate innovative funding	3	6	1	3	3.4	43
1.A.6	Millstream display and pamphlets	3	7	1	1	3.36	44
3.A.4	Inventory and inspect dams	2	9	0	2	3.36	45
4.C.3	Build maintenance reminders into developments	2	9	0	2	3.36	46
4.A.1	Water quality monitoring at municipal boundaries	3	8	1	1	3.33	47
1.A.6	Collect and adapt residential BMPs	2	11	0	0	3.31	48
1.A.1	Storm drain marking program	1	9	0	3	3.2	49
2.B.11	Inform Board of Variance about Municipal Act amendments	1	9	0	2	3.2	50
4.C.1	Conduct dye-testing	1	9	0	3	3.2	51
3.A.2	Install stream gauges	1	10	0	2	3.18	52
1.A.4	DFO-sponsored school programs	1	11	0	1	3.17	53

Action No.	Action	Ratings and Points				Total Points	Ranking
		Crucial	Important	Not Useful	Don't Know		
		5	3	1	0		
1.A.5	Stream ecology school program	1	11	0	1	3.17	54
4.A.4	Set water quality objectives	2	9	1	1	3.17	55
1.C.1	Collect Best Management Practices	1	12	0	0	3.15	56
4.B.1	Maintain water quality pond on Highway	2	10	1	0	3.15	57
1.A.2	Watershed festival on Rivers Day	1	8	1	3	3	58
2.B.4	Tree-cutting restrictions	1	9	1	2	3	60
2.C.2	Distribute information on Federal tax benefits	1	5	1	6	3	61
2.C.3	Seek conservation covenants	0	13	0	0	3	62
3.A.5	Groundwater data collection	0	9	0	4	3	
3.C.4	Investigate options for stormwater utility	0	8	1	4	2.78	65
2.B.3	Review provincial streamside directives		6	1	4	2.71	66

APPENDIX C

STATUS REPORT SHEET

This Appendix contains a Status Report Sheet for tracking actions that have been implemented. Once the Plan has been approved, the Steering Committee will circulate the sheet annually to lead agencies to identify which actions have been implemented and which actions are outstanding. The Steering Committee will then compile a Status Report on Plan Implementation for circulation to Forum members and to participating governments (CRD Board, municipal councils, provincial and federal ministers).

Status Report for the Millstream Watershed Management Plan.

Action		Lead Agency Contact	Date Completed	If not completed, comment on status
1.A.1	Storm drain marking program			
1.A.2	Watershed festival on Rivers Day			
1.A.3	Millstream Web-site			
1.A.4	DFO-sponsored school programs			
1.A.5	Stream ecology school program			
1.A.6	Millstream display and pamphlets			
1.B.1	Landowner contact			
1.B.2	Newspaper articles and inserts			
1.B.3	Create Streamkeepers and Wetland Keepers groups			
1.B.4	Community field days			
1.B.5	Educate about Provincial Emergency Program			
1.B.6	Database on Watershed Management resources and responsibilities			
1.B.7	Improve communications between regulators, landowners and businesses			
1.C.1	Collect Best Management Practices			
1.C.2	Distribute BMPs			
1.C.3	Modify government public works policies			
1.C.4	Training programs for developers			
2.A.1	Compile inventory of mapping and data products			
2.A.2	Review Official Community Plans and other bylaws			
2.B.1	Establish development permit areas			

Action		Lead Agency Contact	Date Completed	If not completed, comment on status
2.B.2	Incorporate environmental reviews into development permits.			
2.B.3	Review provincial streamside directives			
2.B.4	Tree-cutting restrictions			
2.B.5	OCP policy to retain maximum vegetation			
2.B.6	Protect wetlands			
2.B.7	Prohibit building or filling in floodplains			
2.B.8	Land development guidelines			
2.B.9	Stormwater management bylaws			
2.B.10	Review environmental powers			
2.B.11	Inform Board of Variance about Municipal Act amendments			
2.C.1	Encourage appropriate development forms			
2.C.2	Distribute information on Federal tax benefits			
2.C.3	Seek conservation covenants			
2.C.4	Investigate innovative funding			
3.A.1	Collect historic flow data			
3.A.2	Install stream gauges			
3.A.3	Ground-truth hydrologic models			
3.A.4	Inventory and inspect dams			
3.A.5	Groundwater data collection			
3.B.1	Identify 200 year floodplain			
3.B.2	Develop flow management strategies			
3.B.3	Allocate water for fish			
3.C.1	Adopt engineering sign-off sheets			
3.C.2	Install stormwater management infrastructure			
3.C.3	Encourage drainage techniques that use infiltration			
3.C.4	Investigate options for stormwater utility			
4.A.1	Surface water quality monitoring			
4.A.2	Groundwater quality monitoring			
4.A.3	Follow up water quality reports			
4.A.4	Set water quality objectives			
4.B.1	Maintain water quality pond on Highway			
4.B.2	Maintain municipal stormwater infrastructure			

Action		Lead Agency Contact	Date Completed	If not completed, comment on status
4.B.3	Monitor effectiveness of stormwater management technique			
4.C.1	Conduct dye-testing			
4.C.2	Identify and repair septic tank and field system			
4.C.3	Build maintenance reminders into developments			
4.C.4	Require private storm sewer maintenance			
5.A.1	Inventory and map ecological values			
5.A.2	Enhance and restore aquatic habitat			
5.A.3	Ensure no net loss of fish habitat			
5.A.4	Adopt open-stream policy			
6.A.1	Identify key areas of native vegetation removal			
6.A.2	Replanting and restoration program			
6.B.1	Management strategy for rare and endangered species			
6.B.2	Plan parks, trails and greenways			

APPENDIX D

SUGGESTED INDICATORS FOR USE IN PREPARING HEALTH OF THE WATERSHED SUMMARY REPORTS

The Millstream Watershed Management Steering Committee should monitor the success of the Watershed Management Plan through compilation of a "Health of the Watershed Summary Report" every 3-5 years. This report should use measurable indicators to evaluate whether the health of the watershed is improving, remaining constant or degrading. Is Plan implementation resulting in a watershed that meets the vision and goals of the Millstream Watershed Forum? The table below lists some potential indicators for each goal of the Millstream Watershed Management Plan. The indicators should be directly relevant to each goal, with reliable data available on an ongoing basis.

Goal	Potential Indicators	Data Source
1. Landowners, residents community groups, and businesses will understand and support stewardship of the watershed.	▸ Percent of landowners, residents, and business operators surveyed who understand key principles of watershed management	Would require new survey
	▸ Percent of landowners, residents, and business operators surveyed who practice key principles of watershed management	
2. Municipalities, the CRD, and provincial and federal governments will develop and use regulatory and management tools to improve the health of the watershed.	▸ Number of actions proposed in the Millstream Plan that have been implemented.	Annual Millstream Watershed Management Plan Status Report
3. Water flows will be managed to optimize groundwater recharge and summer flows, and minimize flood damage, while maintaining the natural integrity of the watercourse.	▸ Groundwater recharge levels at selected wells	Action 3A.5
	▸ Low summer flows at Millstream stream gauges.	Would require installation of gauges (Action 3A.2)
	▸ Number of times that houses built outside of the 200 year floodplain have been flooded.	Municipal records

Goal	Potential Indicators	Data Source
4. Surface and ground water quality will be protected from human impacts	▸ Fecal coliform levels and chemical contaminants at stations in Millstream Creek	CRD Engineering
	▸ Fecal coliforms and other water quality parameters in groundwater wells	Action 4A.2
	▸ Water quality parameters for Millstream compared to water quality objectives	CRD Engineering & objectives from Action 4A.4
5. The Watershed will contain healthy aquatic ecosystems to support fish, wildlife, and biodiversity.	▸ Percent of stream length and waterbody perimeter with intact adjacent native vegetation (by habitat type).	CRD Roundtable on the Environment
	▸ Index of biotic integrity (stream invertebrates; food for fish)	DFO, Streamkeepers (Action 1B.3)
	▸ Annual salmon returns to Millstream Creek and fish counts by species in selected lakes and streams in the watershed.	GVSEA, Streamkeepers (Action 1B.3)
6. Native flora and fauna will be protected and restored throughout the watershed, wherever feasible	▸ Area of intact native vegetation in Millstream Watershed.	VNHS (Action 6A.1)
	▸ Percent of watershed in protected status (including parks, ecological reserves and conservation covenants).	CRD Parks and municipalities