

































**CURRENT STATUS OF COWICHAN BASIN WATER MANAGEMENT PLAN AND RECOMMENDED ACTIONS 2010**







| <b>Cowichan Basin Water Management Plan Recommended Actions</b>  | <b>Primary (P) &amp; Secondary (S) Responsibility</b><br><b>Progress</b><br><b>Pink=No/ Little</b><br><b>Tan= Slow</b><br><b>Yellow = On Track</b><br><b>Green = Done</b> | <b>Cowichan Watershed Board 2010 Recommendations</b><br>Short Term = 1-2 yr. <br>Medium Term= 3-5 yr. <br>Long Term= 5+ yr.  | <b>Comments</b>  |
|--|---|---|--|
| <b>GOAL 1. MAXIMIZE EFFICIENCY OF WATER USE.</b>   |   |   |  |
| <b>Objective 1a. Initiate improvements to water infrastructure.</b>  |   |   |  |
| 1a-1. Minimize leaks in major water distribution systems by developing and implementing a comprehensive leak detection and system maintenance program. | P. CVRD, Muni's, water utilities<br><br>S. Businesses, homeowners   | Encourage local governments and others (e.g. Catalyst) to implement this recommended action as part of their fundamental business and responsibility to lead by example. Report action plan to CWB by Oct. 15, 2010.   | Action goes hand in hand with metering and is supported by volume based pricing.<br>Note: Although not related to metering Lake Cowichan has found a 500,000 litres per day leak. Links to 1c-1. |
| 1a-2. Install water meters on new water connections and retrofit existing connections.   | P CVRD, Muni's<br><br>S. Water utilities  | Same as 1a-1 above. Notably for Mesachie Lake and City of Duncan. Report schedule to CWB by June 30, 2010.    | This involves leading by example. Links to 1c-1.   |
| 1a-3. Ensure provincial and federal grants for infrastructure are contingent on water metering.  | P Prov., federal gov'ts<br><br>S CVRD, Muni's   | Province has done this.   | Determine whether Federal Government has also adopted this policy as a condition for its infrastructure grants.  |
| 1a-5. Provide incentives (e.g., tax credits, rebates) for replacement of existing plumbing fixtures with water efficient technology.                   | P. Muni's, CVRD<br><br>S. Federal, provincial governments   | Encourage Local Governments to transition from incentives for plumbing fixtures e.g. low flush toilets to incentives for other water saving products e.g. low consumption dishwashers, rain barrels. Report back by Oct. 15, 2010.   | Links to 1c-1.   |







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|---|---|--|---|
| 1a-6. Install water-saving plumbing fixtures (e.g., shower heads, toilets, faucets) in all new construction.  | P. CVRD, Muni's<br>S. Building contractors  | Action complete d.   | Imbedded in building code. Links to 1c-1.   |
| <b>Objective 1b. Improve management of water demand in all sectors.</b>   |   |  |   |
| 1a-4. Work with the Ministry of Environment to require metering of water used under existing and future surface water licences and water extracted from existing and future wells | P. MoE<br>S. CVRD, Muni's   | Recommend that MOE include metering as part of Water Act Modernization (WAM) and that it be supported by monitoring i.e. using the information and audits to support conservation and compliance Support MOE's proposal in WAM discussion paper of beginning with thresholds of 250 cubic meters per day.  | Key to success will be allocating resources to collect and analyse information and enforce regulations. |
| 1b-1. Create a consistent volume-based pricing structure throughout the Basin, and request that the Ministry of Environment apply similar mechanisms.                             | P. CVRD, Muni's<br>S. MoE   | Request that local governments as well as MOE meet and develop a report on basic volume based rates for all jurisdictions plus variable rates or other mechanisms to contribute to replacement of water infrastructure. Report to be provided to CWB by October 15, 2010.                                 | Requires metering.<br><br>Will help to address WAM related pricing issues.<br><br>Links to 1c-1.        |
| 1b-2. Implement conservation based sewer charge (i.e., link sewage treatment costs to water consumption)  | P. Muni's<br>S. CVRD  | Request that local governments provide a report to the CWB on the feasibility of pursuing this recommended action including timelines, by October 15, 2010 as part of 1b-1.   | North Cowichan and Lake Cowichan are reported to have made some progress in this area.                  |






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|--|---|---|--|
| 1b-3. Implement a comprehensive demand management program in the Cowichan Basin that includes the following measures:                    |   |   |  |
| 1b-3a. Ensure that residents, businesses, and industry employ water conservation measures (e.g., xeriscaping, water audits).             | P. CVRD, Muni's, utilities<br><br>S. Businesses, homeowners   | Monitor impacts of metering and volume based pricing to determine what actions, if any may be required. Include comments in Oct. 15 report.     | Volume based pricing may lead to achieving the recommended action.   |
| 1b-3b. Promote the use of rainwater harvesting techniques (e.g., rain barrels, cisterns, dugouts, retention ponds) and grey water reuse. | P. CVRD, Muni's, utilities<br><br>S. Homeowners, farmers, building contractors  | Monitor impacts of metering and volume based pricing to determine what action, if any may be required.  <br>Encourage VIHA/Ministry of Healthy Living to identify approaches for addressing health related issues/concerns particularly for grey water. Report back by July 31, 2010.  | Currently CVRD does not have financial function set up to address this issue.<br><br>Many users (e.g. agricultural community) will need to see the benefits of adopting approaches.<br><br>Report back timing requires discussion. |

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|--|---|---|--|
| 1b-3c. Educate residents, business, and industry about demand management.  | P. CVRD, Muni's<br><br>S. N/A   | Explore opportunity to engage a coop student to develop a best practices report for the Board and develop materials for outreach to the public, business, industry students.   | Will require source of funds.<br>Strong linkages to communications strategy.<br>Coordinator to report back at June CWB meeting |
| 1b-3d. Promote efficient agricultural water use techniques, such as drip irrigation instead of spray irrigation.                               | P. CVRD, Muni's<br><br>S. MoAL  | Seek advice from Special Advisor Ted van der Gulik, Ministry of Agriculture and Land's expert and then develop action plan (date TBD).   | Consider education/extension and incentives.<br>Mr. van der Gulik is scheduled to attend the CWB's June 3, 2010 meeting.       |
| 1b-4 Conduct Independent water audits of Catalyst Paper's Crofton Mill to investigate opportunities to enhance existing conservation measures. | P Catalyst Paper  | Work with Catalyst to explore monitoring opportunities that may result in water savings. Report on plan by June 30/10.   | Catalyst tentatively planning review report will be available October 15/10.   |
| 1b-5. Request that the Ministry of Environment Water Stewardship Division implement the following actions:                                     |   |   |  |







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| 1b-5a. Adopt legislation requiring the licensing of wells and the reporting of volumes used.  | P. MoE<br>S. CVRD, Muni's   | Recommend that MOE include this as part of Water Act Modernization (WAM). Note that licensing and reporting should be supported by monitoring i.e. using the information and audits to reinforce conservation and compliance. Support MOE's proposal in WAM discussion paper of beginning with thresholds of 250 cubic meters per day.  | Key to success will be allocating resources to collect and analyse information and enforce regulations. |
| 1b-5b. For new or amended water licences, attach terms and conditions that require water conservation and reporting of volumes used.                                  | P. MoE<br>S. CVRD, Muni's   | Encourage MOE to include as part of WAM.    | Key to success will be allocating resources to collect and analyse information and enforce regulations. |
| 1b-5c. Amend prov. legislation and guidelines governing water licences to allow licences for in stream conservation without requiring diversion, works, or human use. | P. MoE<br>S. CVRD, Muni's   | Encourage as part of WAM emphasizing that maintaining/enhancing ecological services and habitat conservation should be recognized as primary uses.    | .   |









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|--|--|---|---|
| 1b-5d. Seek opportunities to cancel unused consumptive water licences and do not re-allocate these volumes to other licensees.                   | P. MoE<br>S. CVRD  | Encourage MOE to include as  of WAM.   |   |
| 1b-5e. Reserve unrecorded water in streams for the use of the Crown, for the purpose of conservation and downstream supply.                      | P. MoE<br>S. CVRD, Muni's  | Encourage MOE to include as  of WAM.   |   |
| <b>Objective 1c. Ensure local government and institutions are leaders in water conservation.</b>   |  |   |   |
| 1c-1. Incorporate comprehensive water conservation strategies in Official Community Plans and other land use and development plans and policies. | P. CVRD, Muni's<br>S. N/A  | Request that local government and planning and environment staff to hold a workshop and develop a report and presentation for the CWB on strategies for water conservation and how they can be incorporated effectively into plans and policies.<br>Report to be provided to CWB by October 15, 2010.  | Determine whether changes to Provincial legislation re local governments could help to enable this? |






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| 1c-2. Ensure that local governments lead by example by using water conservation measures, such as xeriscaping and low-flow fixtures, to decrease water use by municipal and institutional operations.       | P. CVRD, Muni's<br><br>S. Schools, community centres, arenas  | Encourage local governments to pursue this based on their responsibility as leaders.–Consistent with CVRD Environment Commission's 12 Big Ideas and lead by example Goal.    | Links to 1d-1 and 1c-1. Significant role for use of indigenous plants, rain gardens etc. here. |
| 1c-3. Develop and implement 'green building' policies (e.g., using LEED standards) that include water conservation and water reuse in the construction and retrofitting of public buildings and facilities. | P. CVRD, Muni's<br><br>S. Developers, architects  | Same as 1c-2 above. Also encourage incorporation of life-cycle costing into benefit/cost analysis of capital projects.   | Links to 1c-1 and 1d-3 .   |
| 1c-4. Adopt a program of regular water use efficiency audits for publicly-owned buildings and infrastructure.   | P. CVRD, Muni's<br><br>S. Schools, community centres, arenas  | Same as 1c-2 above.    | Should be standard part of asset management. Links to 1c-1.                                    |

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|--|---|--|---|
| <b>Objective 1d. Promote land use that increases water use efficiency.</b>   |   |  |   |
| 1d-1. Prepare and amend land use and community plans to promote land uses and development patterns that maximize water efficiency and protect Cowichan Basin water resources.  | P. CVRD, Muni's<br>S. Developers, architects  | Should result from applying recommendations to be reported in 1c-1 and 1d-2.   |   |
| 1d-2. Revise municipal and regional policies, regulations, and land use plans to include Low Impact Development and Smart Growth design principles.  | P. CVRD, Muni's<br>S. Developers, architects  | Include within terms of reference from workshop and report to CWB under 1c-1 above.   |   |
| 1d-3. Develop and implement 'green building' policies (e.g., using LEED standards) that include water conservation and water reuse. Begin with institutional and commercial buildings (Action 1c-3) and eventually include all building types. | P. CVRD, Muni's<br>S. Developers, architects  | Encourage local governments to lead by example as per 1c-3 and identify incentives for encouraging private sector development and retrofitting that incorporates high standards of water conservation. Include in Oct. 15 report.   | Links to 1c-3 above.<br>There is a role for provincial leadership here. |











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| <b>GOAL 5. EDUCATE, ENGAGE, AND EMPOWER CITIZENS IN WATER MANAGEMENT</b>  |   |   |   |
| <b>Objective 5c. Conduct regular monitoring of water related conditions in the Cowichan Basin and provide this information to the public.</b> |   |   |   |
| 5c-1. Monitor and report on volumes of water used annually, including wells, licences, and community sources.                                 | P. CWB, partners<br>S. MoE  | Request requirement under WAM that MoE provide local governments with annual report on volumes used.   |   |
| 5c-2. Require well monitoring and reporting as a condition of rural subdivision, rezoning, or building permit issuance.                       | P. CVRD<br>S. Muni's  | Request that approval bodies (local governments and Ministry of Transportation ensure that adequate water is proven before approvals are given. Include in Oct. 15 report. <br><br>Seek provincial advice on monitoring and reporting and approaches to address cumulative impacts. Raise as an issue under WAM. Report by July 31/10.  | Need to determine whether current processes are adequate.<br><br>Approach must be cost effective/practical. |





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|---|---|---|-------------------------------|
| <b>Objective 5d. Conduct research to support knowledgeable decision-making and water management.</b>  |   |   |                               |
| 5d-1. Collect & maintain data on aquifer capacity, aquifer recharge rate, ground water extraction, & the relationship of ground water pumping to base flow in the Cowichan River & other nearby streams, & make this info. available to the public. | P. MoE<br>S. CVRD, Muni's, local media  | Request that MOE regional office pursue this research in order to better understand linkages between supply and demand.<br>   |                               |
| 5d-2. Develop guidelines for use of ground water and management of aquifers.  | P. MoE<br>S. CVRD, Muni's   | In the short term encourage MOE to work with local governments on best practices regarding land use and ground water use. <br><br>Request the MOE conduct further inventory and assessment of use as well as classification of aquifers within the watershed and based on that information develop guidelines specific to the situation in the watershed.  | Include in July 31/10 report. |
| 5d-3. Study the use of water in Basin agriculture to support measures that will increase the efficiency of irrigation and other water uses.   | P. CVRD<br>S. MoAL  | To be determined based on advice as per 1b-3d above.    |                               |







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|--|---|---|---|
| 5d-4. Apply an adaptive approach to water management, by obtaining and reviewing research data on topics such as: <ul style="list-style-type: none"> <li>- effectiveness of demand management,</li> <li>- climate change effects and responses,</li> <li>- land use-water relationships,</li> <li>- ecological effects of water use and management.</li> </ul> | P. CWB. Partners<br><br>S. MoE, Universities  | Pursue as pilot under innovative approaches to watershed management.<br><br>    | Direct Coordinator will explore feasibility of federal and provincial governments using the Cowichan watershed for monitoring and as an outdoor laboratory for studying water related issues. |








## CURRENT STATUS OF COWICHAN BASIN WATER MANAGEMENT PLAN AND RECOMMENDED ACTIONS 2010

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|--|--|--|--|
| <b>GOAL 2. MANAGE WATER SUPPLY TO MEET HUMAN NEEDS AND MINIMIZE IMPACTS OF LOW WATER LEVELS</b>  |  |  |  |
| <b>Objective 2a. Store sufficient spring runoff to support human use and sustain flows during summer and fall.</b>   |  |  |  |
| 2a-1. Increase the weir height by 30 cm and install pumps below the zero storage elevation to pump water from the Cowichan Lake to Cowichan River when required. | P. Catalyst Paper<br>S. MoE  | Future recommendation will be based on information derived from studies identified in 2c-1 and 2b-4.   |  |
| 2a-2. Recommend that new licences for substantial withdrawals of surface water provide equivalent licensed storage   | P. MoE<br>S. CVRD  | Completed.   | MOE regional staff report that current ministry policy reflects this approach. |
| <b>Objective 2c. Ensure that water storage decisions account for the potential effects of climate change.</b>  |  |  |  |








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|---|---|---|--|
| 2c-1. Periodically assess the water management program in light of climate data and levels of demand.   | P. CWB<br><br>S. MoE, Catalyst Paper  | Work with the Pacific Climate Impacts Consortium (PCIC) to develop a plan for refining projected climate impacts on watershed based on recent climate scenarios and techniques and build that information into the Cowichan Basin Water Management Plans recommendations  required.                | If appropriate work plan will be developed with completion target of Feb. 28, 2011.  |
| <b>Objective 2b. Actively manage spring and summer water levels to minimize the potential for lakeside properties to be adversely affected.</b>       |   |   |  |
| 2b-4. Assess impacts of water storage levels on lakeshore properties and implement appropriate compensation procedures and processes, as in Figure 7. | P. Catalyst Paper<br><br>S. MoE   | Support studies using LIDAR and bathymetric analysis to determine potential impacts on shoreline properties related to Option 2a-1.<br><br>Results should be reported to the CWB by October 31, 2010.    | If it is determined that there would be negative impacts then potential compensation costs should be explored. Conduct preliminary work re erosion issues. |

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|---|---|---|--|
| 2b-1. Revise the weir operation rule curve to include an upper and lower bound of managed water levels in the lake (a rule “band”), as described in Objective 3a. | P. Catalyst Paper<br>S. MoE, CWB  | Support in principle possible proposal to use rule band approach that would allow proceeding with full supply level on July 9, 2010 and storing of summer rainwater if needed to address concerns about potential drought.   | A rule band approach was used in the 1990’s and the early 2000’s. Requires MOE approval and a directive to the licence holder (Catalyst). Support is subject fair and timely consultation process with CWB input. Requires CVRD review. Any communications should be sensitive to concerns of those who could potentially be affected. |
| 2b-2. Operate the weir to store spring and summer inflows to the lake, within rule band limits.   | P. Catalyst Paper<br>S. MoE, CWB  | See 2b-1 Above  |  |
| 2b-3. Store only sufficient water in Cowichan Lake needed to maintain ecological protection and support human use in the Cowichan Basin.                          | P. Catalyst Paper<br>S. MoE, CWB  | Reword and incorporate as a guiding principle.  | This recommended action appears to have been included out of concern regarding water exports vs. watershed management.   |
| <b>Objective 2d. Protect surface and ground water resources from contamination that could reduce supply.</b>  |   |   |  |







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|--|---|---|--|
| 2d-1. Implement Best Management Practices (BMPs) for stormwater management and protection of ground water resources in the Cowichan Basin.   | P. CVRD, Muni's<br><br>S. Developers, forestry companies, farmers, business and home owners   | Request that local governments hold a workshop to assess current impacts and status of best management practice utilization to prevent contamination by October 15, 2010.    | Encourage coordination and collaboration regarding storm water related issues and practices. |
| 2d-2. Investigate and implement strategies to avoid or minimize the release of treated effluent directly to the Cowichan River.  | P. Joint Utilities Board, Town of Lake Cowichan<br><br>S. CVRD  | Included as part of terms of reference of current JUB study.<br><br>Request update of CWB by October 15, 2010 report.   |  |
| 2d-3. Maintain a minimum flow of 7 m <sup>3</sup> /sec from June 15 until the end of the weir operating season, increasing to 8.5 m <sup>3</sup> /sec by 2031, to protect the quality of Cowichan River water. | P. Catalyst Paper, MoE<br><br>S. Joint Utilities Board, Town of Lake Cowichan   | For 2010 included under 2b-1.   |  |
| 2d-4. Using incentives and enforcement of regulations, relocate septic fields susceptible to flooding to avoid contamination of lakes, streams, and the Cowichan River.  | P. CVRD, Muni's<br><br>S. Homeowners  | Request that VIHA investigate conjunction with CVRD staff prepare a report and update CWB by October, 15 2010.   | Doability?   |







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| 2d-5. Install community sewage treatment facilities in Youbou, Honeymoon Bay, Mesachie Lake, Bear Lake, and other lakeside and riverside settlements. | P. CVRD<br>S. N/A   | Request that VIHA assess the extent of any issues in conjunction with CVRD staff and report to CWB by October 15, 2010.   | Links to 2d-1.                            |
| 2d-6. Install sufficient boat sewage pumpouts on Cowichan Lake to serve current and future boating requirements.                                      | P. CVRD, Town of Lake Cowichan<br>S. Marina operators   | Request MOE to prepare an action plan for addressing this issue by ??? and arrange to make a presentation to the CBW.   | Links to 2d-1. How soon can this be done? |
| 2d-7. Enact and enforce regulations to protect ground water resources (e.g., road runoff, commercial, and agriculture operations).                    | P. MoE<br>S. CVRD, Muni's   | Include as part of assessment and report in 2d-1 above.    |   |
| 2d-8. Design and implement pesticide reduction programs, including education and incentives, for homeowners, farmers, and golf courses.               | P. MoE, CVRD, Muni's<br>S. Homeowners, farmers  | Request that MoE identify most effective strategies (i.e. that have worked in other jurisdictions) and submit a report to the CWB by Oct. 15, 2010.   | .   |
| 2d-9. Identify and remediate areas of upland and riverbank erosion.   | P. DFO, MoE<br>S. Local stewardship groups  | Addressed under Goal 3.<br>See under Recommended Action 3b-1.  |   |



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| <b>GOAL 5. EDUCATE, ENGAGE, AND EMPOWER CITIZENS IN WATER MANAGEMENT</b>  |  |  |  |
| <b>Objective 5c. Conduct regular monitoring of water related conditions in the Cowichan Basin and provide this information to the public.</b>   |  |  |  |
| 5c-3. Implement state-of-the-art climatic and hydrologic (i.e., stream flow, lake level, aquifer) instrumentation and monitoring, and link to water management decisions in the Basin.  | P. MoE, Catalyst Paper<br>S. CWB   | Support requests by federal and provincial agencies, First Nations, local governments, the private sector and NGOs directed at acquiring and operating monitoring equipment required for management of the watershed.   | High quality dependable, real time monitoring is essential for making water management decisions and water mgmt. decision tools. Online Cowichan Lake level measurement was installed in Fall 2009. MoE will present results of inflow modelling study in April 2010 to CSRT (improved instrumentation supports accurate modelling). |
| <b>Objective 5d. Conduct research to support knowledgeable decision-making and water management.</b>  |  |  |  |
| 5d-4. Apply an adaptive approach to water mgmt., by obtaining & reviewing research data on topics such as:<br><ul style="list-style-type: none"><li>- effectiveness of demand management,</li><li>- climate change effects and responses,</li><li>- land use-water rshps,</li><li>- ecological effects of water use and mgmt.</li></ul> | P. CWB. Partners<br>S. MoE, Universities   | Pursue as pilot under innovative approaches to watershed management.     | If agreeable to the Board, Coordinator will explore feasibility of federal and provincial governments using the Cowichan watershed for monitoring and as an outdoor laboratory for studying water related issues.  |









## CURRENT STATUS OF COWICHAN BASIN WATER MANAGEMENT PLAN AND RECOMMENDED ACTIONS 2010






| Cowichan Basin Water Management Plan Recommended Actions   | Primary (P) & Secondary (S) Responsibility<br><br>Progress<br>Pink=No/ Little<br>Tan= Slow<br>Yellow = On Track<br>Green = Done | Cowichan Watershed Board 2010 Recommendations<br>Short Term = 1-2 y <br>Medium Term= 3-5 <br>Long Term= 5+   | Comments   |
|--|---|---|--|
| <b>GOAL 3. ENSURE SUFFICIENT WATER IS AVAILABLE TO SUSTAIN AQUATIC AND RIPARIAN ECOSYSTEMS THROUGHOUT THE YEAR.</b>                        |   |   |  |
| <b>Objective 3a. Meet the recommended fish conservation flows year round in the Cowichan River.</b>  |   |   |  |
| 3a-1. Maintain a spring flow of 20 to 30 m <sup>3</sup> /sec from April 1 to May 1 and 15 to 30 m <sup>3</sup> /sec from May 2 to June 15. | P. Catalyst Paper, MoE<br><br>S. DFO, MoE Fisheries   | For 2010 support recommendation regarding implementing rule band and completion of foundational climate, LIDAR, bathymetric and erosion related studies in support of determining actions required to ensure adequate dry season flows and pulses for fish migration. Completion dates of studies TBD by June 2010 meeting..<br><br>   | Maintain capacity to achieve biological thresholds including a buffer on an ongoing basis. |




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|---|---|--|----------|
| 3a-2. Maintain a minimum flow of 7 m <sup>3</sup> /s from June 15 until the end of the operating season to sustain ecological function, increasing to 8.5 m <sup>3</sup> /sec by 2031 to compensate for the effects of increased demand and climate change. |   | Same as 3a-1<br>  |          |
| 3a-3. In wet summers, increase the release to 9 m <sup>3</sup> /sec and, in dry summers, reduce flows to 4.5 m <sup>3</sup> /sec if necessary and as determined by the weir operation rule band.  |   | Same as 3a-1<br>  |          |
| 3a-4. Provide two pulses of water in the fall (last week in September and first week in October) of 16 m <sup>3</sup> /sec for 30 hours each, designed to aid migrating salmon.   | P. Catalyst Paper, MoE<br>S. DFO, MoE Fisheries   | Same as 3a-1<br>  |          |
| <b>Objective 3b. Maintain, enhance, and restore aquatic and riparian habitats.</b>  |   |  |          |










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|--|---|---|---|
| 3b-1. Identify, inventory, and map aquatic and riparian habitats and restoration opportunities.  | P. CVRD, Muni's, DFO, MoE<br>S. Local stewardship groups  | Encourage the Cowichan Roundtable's continued efforts to use the Cowichan Recovery Plan to set annual priorities and present them to the Board by Oct. 31, 2010.  |   |
| 3b-2. Develop land use policies and development patterns that protect, maintain, and enhance healthy aquatic and riparian ecosystems.    | P. CVRD, Muni's<br>S. Developers  | Request that the General Manger of CVRD's Planning and Development Department to lead a local government workshop in cooperation with the CWB directed at developing coordinated policies to ensure that OCPs and bylaws result in the protection and enhancement of aquatic and riparian ecosystems. | Request that results of workshop including any new policies by-laws be reported to CBW by October 31, 2010. |
| 3b-3. Continue and expand habitat improvement projects, including spawning channel improvements and riparian restoration and replanting. | P. DFO, MoE Fisheries<br>S. Cowichan Stewardship Round Table  | Include as part of 3b-1.  |   |
| 3b-4. Adopt or amend tree protection bylaws to strictly regulate tree cutting and vegetation clearing in riparian areas.                 | P. CVRD, Muni's<br>S. Developers, landowners  | Include as part of 3b-2 workshop and report out.  | Important to include cultural values.   |

| <b>Cowichan Basin Water Management Plan Recommended Actions</b>   | <b>Primary (P) &amp; Secondary (S) Responsibility</b><br><b>Progress</b><br><b>Pink=No/ Little</b><br><b>Tan= Slow</b><br><b>Yellow = On Track</b><br><b>Green = Done</b> | <b>Cowichan Watershed Board 2010 Recommendations</b><br>Short Term = 1-2 y <br>Medium Term= 3-5 y <br>Long Term= 5+ y  | <b>Comments</b>   |
|---|---|---|---|
| 3b-5. Protect riparian habitats from adverse effects of logging, industrial, commercial, and residential development through enforcement of local and provincial regulations.                   | P. CVRD, Muni's<br><br>S. Developers, forestry companies, business and home owners  | Include as part of 3b-2 workshop and report out.<br><br>    | Recommend that development of more educational materials be addressed as a priority |
| 3b-5a. Ensure consistent enforcement of Riparian Areas Regulation setbacks and associated controls on development adjacent to streams, wetlands, lakes, and rivers by all levels of government. | P. CVRD, Muni's<br><br>S. Developers, landowners  | Include as a topic for both 3b-2 and 2e workshops.<br><br>    | Enforcement should focus on most material developments.                             |
| 3b-5b. Enforce compliance with the riparian protection elements of the Private Managed Forest Land Act and the Private Managed Forest Land Council Regulation.                                  | P. Private Managed Forest Land Council<br><br>S. CWB  | Include this as a topic for workshop as part of 2e1-4 and request that the Private Managed Forest Land Council focus audit activities in the watershed in the short term.<br><br>  |   |








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|--|---|--|---|
| <b>Objective 2e. Manage land and resources to avoid adverse effects on Basin hydrology (quantity and timing of runoff).</b>  |   |  |   |
| 2e-1. Minimize effects of land cover changes on Basin hydrology by ensuring land management meets or exceeds enacted regulations and bylaws.   | P. Private Managed Forest Land Council, PMFLC, MoAL, forestry companies<br>S. CVRD, Munis, CWB                              | Include in 3a-2 and 2e-2, 3, 4<br>  |   |
| 2e-2. Using forestry, land cover, hydrology, and climate change research, identify potential improvements in watershed management and, if appropriate, recommend amendments to provincial regulation and local bylaws. | P. Private Managed Forest Land Council, MoFR, MoAL, forestry companies<br>S. CWB  | Host a CWB community and expert workshop on the impacts of climate change on the vegetation and water resources of the watershed and how the forest sector (including the MOF and the private sector) intends to address these impacts. Tentative date October 2010.<br>             | Coordinator to report on progress at June meeting. Recommendations should include an action plan including policies, practices to protect hydrological resources. |






| <b>Cowichan Basin Water Management Plan Recommended Actions</b>  | <b>Primary (P) &amp; Secondary (S) Responsibility</b><br><b>Progress</b><br><b>Pink=No/ Little</b><br><b>Tan= Slow</b><br><b>Yellow = On Track</b><br><b>Green = Done</b> | <b>Cowichan Watershed Board 2010 Recommendations</b><br>Short Term = 1-2 y <br>Medium Term= 3-5 y <br>Long Term= 5+ y  | <b>Comments</b> |
|--|---|---|-----------------|
| 2e-3. Engage forest companies, the Ministry of Agriculture and Lands, the Ministry of Forests and Range, and other interests in collaborative development of land and resource use practices that protect the hydrology and water quality of the Cowichan Basin. | P. CWB, MoFR, MoAL, forestry companies<br><br>S. CVRD, Muni's   | Include in 2e-2   |                 |
| 2e-4. Engage the community in developing and implementing land cover policies and other watershed management practices that protect the Basin's hydrology.   | P. CWB<br><br>S. Forestry companies   | Include in 2e-2   |                 |







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|--|---|--|--|
| <b>Objective 5c. Conduct regular monitoring of water related conditions in the Cowichan Basin and provide this information to the public.</b>  |   |  |  |
| 5c-3. Implement state-of-the-art climatic and hydrologic (i.e., stream flow, lake level, aquifer) instrumentation and monitoring, and link to water management decisions in the Basin.   | P. MoE, Catalyst Paper<br>S. CWB  | Support MOE Water branch request to reinstate Heather Mountain climate station and add flow metering to supplement inflow measurement. Request that MOE continue its hydrological study of the watershed to provide a clearer understanding of factors affecting inflows. (Recommend that work be done in consultation with PCIC)<br><br> | High quality dependable, real time monitoring is essential for making water management decisions and water management decision tools.<br><br>Online Cowichan Lake level measurement was installed in Fall 2009. MoE will present results of inflow modelling study in April 2010 to CSRT (improved instrumentation supports accurate modelling). |
| <b>Objective 5d. Conduct research to support knowledgeable decision-making and water management.</b>   |   |  |  |
| 5d-4. Apply an adaptive approach to water management, by obtaining and reviewing research data on topics such as:<br><ul style="list-style-type: none"><li>- effectiveness of demand mgmt,</li><li>- climate change effects &amp; responses,</li><li>- land use-water relationships,</li><li>- ecological effects of water use and management.</li></ul> | P. CWB. Partners<br>S. MoE, Universities  | Pursue as pilot under innovative approaches to watershed management<br><br><br><br>   | As per other Goals, Coordinator will explore feasibility of federal and provincial governments and others using the Cowichan watershed for monitoring and as an outdoor laboratory for studying water related issues.  |













## CURRENT STATUS OF COWICHAN BASIN WATER MANAGEMENT PLAN AND RECOMMENDED ACTIONS 2010

| Cowichan Basin Water Management Plan Recommended Actions  | Primary (P) & Secondary (S) Responsibility<br><b>Progress</b><br>Pink=No/ Little<br>Tan= Slow<br>Yellow = On Track<br>Green = Done | Cowichan Watershed Board 2010 Recommendations<br>Short Term = 1-2 yr <br>Medium Term= 3-5 yr <br>Long Term= 5+ yr  | Comments  |
|---|--|---|---|
| <b>GOAL 4. REDUCE THE IMPACTS OF HIGH WATER LEVELS, RESPECTING THE IMPORTANCE OF WINTER FLOODS TO NATURAL SYSTEMS.</b>                                |  |   |   |
| <b>Objective 4a. Establish adequate development setbacks from Cowichan Lake and River to reduce potential flooding risks.</b>                         |  |   |   |
| 4a-1. Extend coverage of 200-year floodplain mapping to include all areas of the Basin.   | P. MoE<br>S. CWB   | Develop/upgrade precision of floodplain mapping for: <ul style="list-style-type: none"> <li>• Lake Cowichan; and </li> <li>• Portion of River not included Northwest Hydraulics study </li> </ul>     | Request that CVRD's Planning and Development Department coordinate as funding is available. |
| 4a-2. Review current 200-year floodplain levels and update as required using state-of-the-art hydro-technical data and hydraulic analysis techniques. | P. MoE<br>S. CWB   | See 4a-1 above.    |   |
| 4a-3. Continue to enforce bylaws that prohibit new development or deposit of fill below the 200-year flood level.                                     | P. CVRD, Muni's<br>S. Developers, landowners   | Request local government to provide a plan and the rationale for 'below 200 year flood level building exemptions' and report to the CWB by October 15, 2010.   | Same as 4a-1  |

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|--|---|--|---|
| 4a-4. Flood proof at-risk structures where practical.  | P. CVRD, Muni's<br><br>S. MoE   | Request that local governments identify and prioritize key at risk structures and report to the CWB by October 15, 2010.    | Certain structures e.g. JUB should represent high priorities. Should be incorporated into IMFP in 4b-1  |
| <b>Objective 4b. Increase the flood buffering capacity of floodplain and constricted channel areas.</b>  |   |  |   |
| 4b-1. Involve all Muni's and electoral areas in the preparation and implementation of a Flood and Drainage Management Plan or Integrated Flood Management Plan (IFMP) for the Cowichan Basin to provide a coordinated approach to stormwater and flood management. | P. CVRD, Muni's<br><br>S. Cowichan Tribes   | Request the CVRD to host a workshop in partnership with the CWB. The workshop is to include Cowichan Tribes, municipalities, MOTI, MCRD, MOE, MSGPS, DFO and INAC and focus on development of an integrated approach for implementation of an IFMP including rainwater balance for the catchment area. Request that the results of the workshop be reported back to the CWB by October 31, 2010.  | Estimated cost of rainwater balance for catchment area project is \$30,000.<br><br>Request that CVRD's General Manager of the CVRD's Planning and Development Services to coordinate. |

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|---|---|---|--|
| 4b-2. Maintain the capacity of the Cowichan River channel to accommodate flood flows where it is obstructed by gravel, debris or structures.  | P. CVRD, Muni's<br><br>S. Cowichan Tribes   | Include in 4b-1as priority.    | Feasibility could be enhanced through negotiations with Canada re transferring revenue related to gravel to Cowichan Tribes. |
| <b>Objective 4c. Ensure drainage is adequate to allow tillage of farm fields in late spring.</b>  |   |   |  |
| 4c-1. Develop and implement a drainage improvement and control system for the Somenos and Quamichan sub-basins as part of the integrated FDMP | P. MoAL, Muni's,<br><br>S. Farmers  | Seek advice from special Advisor van der Gulik and MAL's District agrologist regarding a solution that preserves ecological integrity and is consistent with the IFMP.   | Wayne Haddow lead.   |
| 4c-2. Promote crop selection in the Somenos and Quamichan sub-basins that is appropriate for their soil and hydrologic conditions.            | P. Farmers<br><br>S. MoAL   | Same as 4c-1 above.    | Wayne Haddow lead.   |

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|--|---|---|----------|
| <b>Objective 4d. Maintain winter water levels that are high enough to protect organic soils.</b>   |   |   |          |
| 4d-1. Maintain winter and spring inundation of low-lying areas of the Somenos and Quamichan sub-basins, to protect organic soils and to maintain ecological functions.   | P. Muni's<br><br>S. Farmers, Cowichan Tribes, MoAL  | Same as 4c-1.   |          |
| <b>Objective 4e. Promote stormwater management that emphasizes infiltration and detention and minimizes impervious surfaces to avoid increases in peak flows.</b>  |   |   |          |
| 4e-1. Install appropriate stormwater management infrastructure based on Low Impact Development (reduced runoff, on-site infiltration) in new developments and retrofit existing developments to reduce peak runoff consistent with the FDMP. | P. CVRD, Muni's<br><br>S. Developers, landowners  | Request that the CVRD lead development of a coordinated local government plan with supporting rationale for adopting low impact development principles by ----, 2011 and report progress to the CWB by October 15, 2010. <br><br>Request that the CVRD Board explore opportunities utilizing gas tax to fund the initiative. |          |

| <b>Cowichan Basin Water Management Plan Recommended Actions</b>  | <b>Primary (P) &amp; Secondary (S) Responsibility</b><br><b>Progress</b><br><b>Pink=No/ Little</b><br><b>Tan= Slow</b><br><b>Yellow = On Track</b><br><b>Green = Done</b> | <b>Cowichan Watershed Board 2010 Recommendations</b><br>Short Term = 1-2 yr <br>Medium Term= 3-5 yr <br>Long Term= 5+ yr  | <b>Comments</b>   |
|--|---|--|---|
| 4e-2. Adopt (Develop unified) subdivision or development services bylaws and Official Community Plan policies based on Low Impact Development principles.  | P. CVRD, Muni's<br><br>S. Developers  | Request that the CVRD lead development of a coordinated approach to local govt. bylaws, OCPs and policies to support Storm water management. For October 15, 2010, prepare progress report for review by CWB. Target completion date 2011.   |   |
| <b>Objective 5d. Conduct research to support knowledgeable decision-making and water management.</b>   |   |  |   |
| 5d-4. Apply an adaptive approach to water management, by obtaining and reviewing research data on topics such as: <ul style="list-style-type: none"> <li>- effectiveness of demand management,</li> <li>- climate change effects and responses,</li> <li>- land use-water relationships,</li> <li>- ecological effects of water use and management.</li> </ul> | P. CWB. Partners<br><br>S. MoE, Universities  | Pursue as pilot under innovative approaches to watershed management<br><br>    | As per other Goals, Coordinator to explore feasibility of federal and provincial governments, universities and others supporting Cowichan watershed management and monitoring and use as an outdoor laboratory for studying water related issues. |

