



**for a living planet®**

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Honourable Terry Lake  
Minister of the Environment  
PO Box 9047 Stn Prov Govt  
Rm 247, Parliament Buildings  
Victoria BC, V8W 9E2

March 22, 2011

Dear Minister Lake:

***Re: Flowing into the Future- Protection of Environmental Flows in BC's Proposed Water Law***

Congratulations on your appointment as Minister.

WWF-Canada is one of Canada's oldest and strongest environment nongovernmental organizations, with BC offices in Vancouver and Prince Rupert. I am writing to you today about protection of water, BC's most valuable natural resource, and the opportunity your government has to take a leading role in water law with the proposed Water Sustainability Act.

While some indicators of freshwater health are troubling, BC still is in the unique and enviable position of having some of the world's longest free-flowing rivers, and can act to conserve wild rivers as part of our global stewardship responsibility.

However, WWF is concerned that the proposed new Act does not fully address our top priority-environmental flows. The attached brief, titled *Flowing into the Future*, outlines our concerns.

***Environmental Flows- The Master Variable for River Health***

Water flow regimes are recognized as the "master variable" for aquatic ecosystem health. Just like blood pressure in the human body, the flow and movement of water is a vital indicator and driver of overall aquatic ecosystem health.

WWF-Canada submits that the most important priority for water law reform in BC is to put environmental flows at the centre of the Water Sustainability Act. Protecting environmental flows

is good for the environment and good for the economy, helps prevent water conflicts, and has the potential to save time and money. To illustrate the last point, Alberta's Athabasca River planning process – that has a major focus on protection of environmental flows – has already cost more than \$4.6 million. In addition, BC can help set the forthcoming national direction on flow protection that is under development by the CCME, Fisheries and Oceans Canada and other federal agencies.

***Suggestions for Strengthening Province's Current Proposals on Environmental Flow Protection***

We recommend that environmental flow protection be applied to all rivers and streams in the province, not just those in chronic problem areas as currently proposed. (We do recognize that new licences will give some consideration to environmental flows, a long overdue action, first authorized by the legislature in 1997 in the Fish Protection Act, but never brought into force.)

Taking the precautionary step to protect all environmental flows now, while the legislative change window is open, will preserve BC's freshwater into the future. We have suggested different ways to achieve this goal in the attached Brief, and also noted the many places around the world where these steps are already in place. We need look no further than Alberta with its ongoing controversies related to overallocated river systems to see where BC could be headed if reforms are not enacted now.

We would appreciate your response to this letter, and request additional details about your plans to protect the environmental flows for all of BC's rivers and streams.

We look forward to continued collaboration with your government on this critical issue.

For a living planet,

A handwritten signature in black ink that reads "Linda Nowlan". The signature is written in a cursive, flowing style.

Linda Nowlan  
Director, Pacific Conservation WWF-Canada

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# FLOWING INTO THE FUTURE

## *WWF-Canada Comments - British Columbia's Water Sustainability Act Policy Proposal<sup>1</sup>*

The BC provincial government is poised to amend its century-old water law, first passed in 1909. By leading on water law, BC can add to its list of environmental law firsts, on climate change, agricultural land preservation, and ecosystem protection in the landmark Great Bear Rainforest agreement.

The province's new water law can live up to the true promise of its proposed name- the Water **Sustainability** Act. (Emphasis added)

WWF-Canada believes the top priority for the new Act should be the protection of the environmental flows of BC rivers and streams, to ensure that the province's freshwater resources and ecosystems are maintained for future generations.

This submission first discusses the benefits of environmental flow protections, then addresses the 'basics' of how the new Act could protect these flows, next proposes methods to deal with existing water licences that compromise flows, and finally makes suggestions for procedures to determine environmental flows.

## I. BENEFITS OF ENVIRONMENTAL FLOW PROTECTION

### *Protection of Biodiversity*

If these flows aren't protected and restored, there's a risk that galloping human use will imperil the ecosystems that depend on water. An alarmingly large proportion - 37 per cent - of freshwater fish in BC is already red-listed as endangered.<sup>2</sup>

### *BC Can Set National Direction*

There will likely soon be a coordinated national approach to this vital freshwater issue. BC can act first to define how to protect environmental flows and contribute to the development of a national standard. Calls for a national approach to environmental flow protection are growing stronger, most recently from the National Round Table on the Environment and the Economy,<sup>3</sup> and the Canadian Council of Ministers of the Environment.<sup>4</sup> A science panel of the Department of Fisheries and Oceans recommended establishing a DFO science advisory process to provide a

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<sup>1</sup> This submission was prepared by Linda Nowlan, Director, Pacific Conservation, WWF-Canada with assistance and review from Tony Maas, Mat LeBel and James Casey, all with WWF-Canada. The author is grateful for their assistance.

<sup>2</sup> [http://www.env.gov.bc.ca/soe/indicators/SP02\\_Red\\_list\\_species.html](http://www.env.gov.bc.ca/soe/indicators/SP02_Red_list_species.html)

<sup>3</sup> NRTEE, Changing Currents, Chapter 2 ADDRESSING NATURE'S WATER NEEDS- Ecosystem Services.

<sup>4</sup> CCME Water Action Plan October 2010 action item: 3.3 Identify and share best management practices for in-stream flow (ecosystem) needs, water allocation and budgeting.

consistent national framework for the evaluation of environmental flows, also known as instream flow needs, including ecosystem indicators, and a consideration of the impacts of climate change on flows.<sup>5</sup>

### ***Good for the Environment, Good for the Economy***

Standards to maintain environmental flow contribute to greater economic certainty and can actually drive economic development and innovation in at least two ways. First, setting standards for environmental flows recognizes the value of and secures water to sustain the “free” ecosystem goods and services provided by healthy aquatic ecosystems – values that are typically excluded from the economics of water management. This includes things like productive fisheries, recreational opportunities and groundwater recharge. Second, securing water instream through environmental flow standards creates the incentive to improve water productivity – to derive more economic and social benefit from available water. The incentive to improve water productivity translates, in turn, to incentives for innovation in the water technology and management sector.

### ***Prevent Water Conflicts, Save Time and Money***

Setting standards in advance can also prevent conflict. Having standards in place would prevent the politically unpalatable decision to modify, enforce, cancel, or purchase back water licences where they prevent environmental flow objectives from being met. Standards can also save time and money in planning implementation phases of water policy reform. Australia’s Murray Darling river system provides an astounding example of cost; the Australian government has allocated \$3.1 billion to buy back water licences so that rivers won’t run dry.<sup>6</sup> It is much more economical and far less controversial to secure environmental flows before crises, conflict and the need for costly mediation processes and mitigation activities arise.

## **II. PROTECTIONS FOR ENVIRONMENTAL FLOWS IN NEW ACT**

WWF-Canada submits that the proposed Water Sustainability Act should do three basic things: put flows at the centre of the new law, define the term environmental flow, and enact strong legal protection for environmental flows.

### ***PUT ENVIRONMENTAL FLOWS AT THE CORE OF THE NEW LAW***

Water flow regimes are widely recognized as the “master variable” for aquatic ecosystem health and are a key factor in sustaining native biodiversity and ecosystem integrity.<sup>7</sup>

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<sup>5</sup> [http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/sar-as/2010/2010\\_055\\_e.pdf](http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/sar-as/2010/2010_055_e.pdf) Also In response to an audit by the Commissioner of Environment and Sustainable Development in 2009, DFO noted that it was developing a policy to address large-scale habitat loss, which may include specific protection for environmental flows.

<sup>6</sup> Hone, S., Foster, A., Hafi, A., Goesch, T., Sanders, O., Mackinnon, D., and B. Dyack. 2010. Assessing the future impact of the Australian Government environmental water purchase program. Australian Bureau of Agricultural and Resource Economics research report 10.03, Canberra, April.

<sup>7</sup> Annear, T., I. Chisholm, H. Beecher, A. Locke, P. Aarrestad, C. Coomer, C. Estes, J. Hunt, R. Jacobson, G. Jöbssis, J. Kauffman, J. Marshall, K. Mayes, G. Smith, R. Wentworth, and C. Stalnaker. 2004. Instream Flows for Riverine Resource Stewardship, Revised Edition. Cheyenne, WY: Instream Flow Council: Carlisle, D.M., Wolock, D.M., and M.R. Meador. 2010. Alteration of streamflow magnitudes and potential ecological consequences: a multiregional assessment. *Frontiers in Ecology and the Environment*,

Just like blood pressure in the human body, the flow and movement of water is a vital indicator and driver of overall aquatic ecosystem health.

The map in Appendix A of the Policy Proposal shows about a third of the province in an identified area of natural summer low-flow sensitivity. Oil and gas developments in the northeast corner of the province consume huge amounts of fresh water, parched agricultural areas in the Okanagan compete with some of Canada's fastest growing urban areas, and the water needs of fish and many other aquatic and non-aquatic species are unfulfilled.

Placing environmental flows at the centre of the Water Sustainability Act would provide the legal framework to achieve the top four actions of Living Water Smart:

*By 2012, all land and water managers will know what makes a stream healthy, and therefore be able to help land and water users factor in new approaches to securing stream health and the full range of stream benefits.*

*By 2012, water laws will improve the protection of ecological values, provide for more community involvement, and provide incentives to be water efficient.*

*Legislation will recognize water flow requirements for ecosystems and species.*

*Government will require all users to cut back their water use in times of drought or where stream health is threatened. (<http://www.livingwatersmart.ca/actions.html>)*

While implementing legal protection for environmental flows may pose implementation challenges, many places have tackled these challenges at a nation or state-wide scale.

### **DEFINE THE TERM ENVIRONMENTAL FLOW**

The new Act should define the term environmental flow and use it rather than other terms, such as instream flow or instream flow needs, to reflect state of the art scientific understanding and policy perspective. Alberta has taken this approach.<sup>8</sup> Environmental flows describe the quantity, timing, and quality of water flows required to sustain our flowing water ecosystem and the human livelihoods and well-being that depend on these ecosystems.<sup>9</sup> Characteristics of a flow regime needed to secure integrity of aquatic ecosystems include magnitude, timing, frequency, duration, variability and rate of change.

### **ADOPT STRONG LEGAL PROTECTION FOR ENVIRONMENTAL FLOWS**

WWF-Canada submits that the new Act should safeguard environmental flows across the province by:

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doi:10.1890/100053. Poff, N.L., Allan, J.D., Bain, M.B., Karr, J.R., Prestegard, K.L., Richter, B.D., Sparks, R.E., and J.C. Stromberg. 1997. The natural flow regime: a paradigm for river conservation and restoration. *BioScience*, 47: 769–784.

<sup>8</sup> <http://www.srd.alberta.ca/ManagingPrograms/FishWildlifeManagement/EnvironmentalFlowsProgram/Default.aspx>

<sup>9</sup> This is the most common definition of environmental flows, which comes from the Brisbane Declaration, a widely endorsed global call to action to protect the world's rivers: [http://www.eflownet.org/download\\_documents/brisbane-declaration-english.pdf](http://www.eflownet.org/download_documents/brisbane-declaration-english.pdf)

1. Setting a single province wide standard to protect environmental flows, or
2. Requiring regionally specific broad environmental flows standards to be determined, based on a classification scheme to group rivers and streams of the same type.

Either of these first critical steps would provide comprehensive protection for the key element of a river's health throughout the province. There are merits to each possibility. A single standard is easy, while regionally specific standards for each group of rivers and streams recognize differences in flow regimes. But if neither of these first steps is taken, then most of the province's rivers will be left unprotected in terms of environmental flows.

After this first step has been taken, then the new Act should also:

3. Require time-bound plans for the most water-stressed areas, named in the Act or in regulations, that set environmental flow conditions and then require all licences, new and existing, to be subject to maintain those flow conditions. These plans would be tailored to local river and watershed conditions, and would be more specific than a province-wide standard (remove presumptive) or a flow standard for a particular class of rivers.

#### ***Problem with Current Environmental Flow Proposal and How to Solve It***

As the proposal now stands, only the third action listed above will occur, leaving most of the province unprotected when it comes to environmental flows. We believe this is a missed opportunity. BC can set lasting protections in place now for many wild rivers. It can signal to business which rivers are open for further development and which must be left intact for their essential ecosystem functions.

The government proposes to address environmental flows only for 'chronic problem areas' by authorizing (but not requiring) a water allocation plan or a new type of plan called a 'watershed sustainability plan'. There are two problems with this approach, in WWF-Canada's opinion:

First, it does not address environmental flows for the majority of the province, including many of the wild river areas. For example, northern communities may not qualify as chronic problem areas due to low population densities, and relative abundance of water. The Outdoor Recreation Council of BC notes that governments need to be more proactive in protecting productive northern rivers. The Sacred Headwaters tied for top place as BC's most endangered river for 2010. Freshwater resources are under increasing stress from oil and gas development as well, as the Pembina Institute noted in its' recent submission to the province on this Act. To illustrate further, fully a quarter of the surface waters in the province have recorded restrictions. The Ministry of the Environment maintains a list of water allocation restrictions which is currently at 53 pages. Groundwater declines are also evident in many heavily populated areas of the province.

The second problem with relying solely on plans to protect environmental flows is that while some water plans, like the allocation plans on the east coast of Vancouver Island, have been helpful, many other water plans remain unimplemented. Water planning provisions in the existing laws are seldom used. Only one water management plan has been proposed under the relatively new provision in Part IV of the Water Act. No drinking water management plans have been prepared under the similarly recent Drinking Water Protection Act. We are concerned that introducing another new planning provision may not be the tool needed to solve water stress in areas like the Okanagan, unless the new planning provision has clear geographical application, deadlines for both plan preparation and plan implementation and strong public participation provisions.

Given these conditions and the coming impacts from climate change which will further affect flows, it is critical to act now, especially as this legislative window for change is open. WWF-Canada submits that what's required is a province wide standard set out in the Act, or regionally specific standards that apply to each division of rivers in a particular class. Either one of these protections will provide the minimum level of protection that's needed for aquatic ecosystem health. The more detailed watershed sustainability plans can then be prepared for the areas with the most problems and can be tailored to local conditions.

To provide the necessary level of protection for environmental flows, a new Act should also:

4. Require (not allow) environmental flows to be considered in all new licences, and
5. Require review of licences at periodic intervals to enable response, where present, changing flow conditions and to enhanced understanding of flow-ecology relationships.

More details on each of these five actions, and a brief description of the many places where the techniques are already in use, are set out below.

1. SET A PROVINCE WIDE STANDARD OR REQUIRE FLOWS TO BE DETERMINED FOR EACH MAJOR SET OF WATER BODIES

Though water conditions vary widely in BC, this is true of most places. Many countries and states have chosen the administratively simple method of setting a standard for the whole region.

Switzerland's Federal Law on Water Protection sets minimum water flows. Swiss cantons may set higher minimum flows after weighing the economic and ecological interests on a case-by-case basis.<sup>10</sup>

South Africa's water law requires the amount of water required for a Reserve (which includes both basic human needs and protection of aquatic ecosystems) to be ensured before water resources are allocated to other water users.<sup>11</sup>

All the disparate countries in the European Union are governed by the EU *Water Framework Directive* (WFD) which has the overall objective of achieving "good status" of all water bodies in the EU member states and associated states by 2015. Implementing environmental flows will be a key measure for restoring and managing river ecosystems under the WFD.<sup>12</sup> Transposing the WFD into national water laws can mean requirements for specific

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10 <http://www.bafu.admin.ch/gewaesserschutz/01284/index.html?lang=en>

11 South Africa, National Water Act 36 (1998) Chapter 3, part 3 "Reserve" means the quantity and quality of water required -(a) to satisfy basic human needs by securing a basic water supply, as prescribed under the Water Services Act, 1997 (Act No. 108 of 1997), for people who are now or who will, in the reasonably near future, be -(i) relying upon; (ii) taking water from; or (iii) being supplied from, the relevant water resource; and (b) to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource;

12 See sections 1.1.1, 1.1.2, 1.2.1 and 1.2.2 of Annex V of the WFD. See also Acreman, M. C., and J. D. Ferguson. 2010. Environmental flows and the European Water Framework Directive. *Freshwater Biology* 55: 32-48.

water flows at a particular location and a specified period in time, as in the Scottish Water Environment and Water Services Act.<sup>13</sup>

New Zealand is currently developing a national environmental standard on ecological flows and water levels. Mexico, Japan, and a number of South American and African countries provide additional examples of national environmental flow laws.<sup>14</sup>

Major efforts have been devoted to environmental flow law in the US as well, through the application of a variety of laws at the state level:

- Washington State requires the government to establish instream flows for each river or stream.
- Maine's In-stream Flows and Lake and Pond Water Levels rule establishes river and stream flows and lake and pond water levels to protect natural aquatic life and other designated uses in the state's waters.
- Michigan uses maintaining healthy fish assemblages as the overall ecological objective for water management across the entire state.
- Florida law requires the state water management districts or the Department of Environmental Protection to establish minimum flows and levels for aquifers, surface watercourses, and other surface water bodies to identify the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area.<sup>15</sup>

## 2. OR REQUIRE REGIONALLY SPECIFIC ENVIRONMENTAL FLOWS TO BE DETERMINED FOR CLASSES OF RIVERS AND STREAMS

If the province decides not to proceed with a standard that applies province-wide, the new Act should require regionally specific flows to be determined, based on a classification scheme that groups major rivers of the same type. This could involve setting interim standards with clear time bounds that can be varied at the local level.<sup>16</sup>

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13 See Water Environment and Water Services (Scotland) Act 2003 ASP3 (WEWS), Water Environment (Controlled Activities) (Scotland) Regulations, 2005 (CAR 2005) No.348 Sch.3, Scotland River Basin District (Surface Water Typology, Environmental Standards, Condition Limits and Groundwater Threshold Values) Directions 2009 (SRBDD 2009), online at <http://www.scotland.gov.uk/Resource/Doc/298071/0092869.pdf>.

14 [http://www.unep.org/dec/PDF/UNEP\\_Greening\\_water\\_law.pdf](http://www.unep.org/dec/PDF/UNEP_Greening_water_law.pdf), UNEP Greening Water Law , 2010

15 § 373.042, F.S., Minimum Flows and Levels, If actual flows or levels are, or during the next twenty years are expected to be below established minimum flows or levels, the District develops and implements a recovery or prevention strategy (Chapter 40D-80, F.A.C.), in accordance with state law (Chapter 373.0421, Florida Statutes).

<sup>16</sup> New Zealand's proposed national ecological flow standard includes proposed interim limits on alterations to flows and water levels for water bodies that do not currently have such environmental flows specified in a water plan. The interim limits will apply until an alternative is established through the regional plan process.



The UK has assigned each of its rivers to one of 10 classes, based on physical watershed characteristics, to facilitate application of withdrawal thresholds.

Three US states illustrate the application of this approach. Each assigns ecological goal classes to rivers and streams, and sets specific degrees of allowable flow alteration to each goal.

- Maine uses four classes: class AA, Outstanding natural resource for preservation, class A - Habitat for fish and other aquatic life is natural, class B - Habitat for fish and other aquatic life is unimpaired, and class C - Habitat for fish and other aquatic life exists.
- Connecticut also uses four classes: Class 1 natural waters, which give priority to ecological health, Class 2 near natural, and Class 3 ecologically sufficient waters which balance ecological and human interests, and Class 4 ecological non-attainment which weigh human interests most greatly.
- North Carolina's seven classifications are coastal streams, small stable streams – cool and cold water, large stable streams, small flashy streams – natural and accidental, large Piedmont rivers, medium stable streams – cool and warm water, and small seasonal streams – natural and accidental.

### 3. AND REQUIRE TIME-BOUND PLANS WITH ENVIRONMENTAL FLOW PROTECTIONS FOR THE MOST WATER-STRESSED AREAS

WWF-Canada submits that the most water stressed areas require even more attention to environmental flows. The Policy Proposal recognizes this need in its brief discussion of “chronic problem areas,” for which the province envisions the use of watershed sustainability plans, recovery actions for degraded watersheds. These chronic problem areas, - the Okanagan, Fraser Valley and east coast of Vancouver Island as roughly outlined in the map in Appendix B of the proposal- are also seemingly the sole places where the province is contemplating changes to existing licences such as licence expiry dates or cutbacks on water allocations .

As WWF-Canada sees it, once the new Act has set a single provincial standard or a set of standards for classes of rivers and streams, then the watershed sustainability plans for the most stressed areas can set more specific environmental flow conditions and require all existing and new licences be subject to maintaining those flow conditions.

If the first step is not taken, environmental flows will be compromised. Developing and then implementing the proposed watershed sustainability plans will take a lot of time, and considerable resources. (Alberta's Athabasca River planning process – that has a major focus on protection of environmental flows – has already cost more than \$4.6 million.) In the interim, aquatic ecosystem in the stressed areas will continue to be threatened.

There are a large number of water plans now in use in BC, but no coordinated provincial approach to the use of these plans. While this allows for flexibility, the ‘community by community’ approach also means that many places repeatedly struggle with the same issues. Local and regional governments and collaborative water governance bodies look to the province for guidance on the most serious water issues requiring scientific and resource management expertise not usually available at the local level. Foremost among these issues is how to protect flows.

One unanswered question is whether chronic problem areas will be identified in the Act or regulations to enable action to be immediately taken to address water issues. WWF-Canada recommends listing the areas in the law for greater certainty and to ensure that the plans get prepared and implemented in a timely manner. To be most

effective in protecting environmental flows, plans should be mandatory, enforceable, and time-bound and include adaptive triggers / thresholds to respond to changes in water flow regimes resulting from climate change, and to enhanced understanding of flow-ecology relationships.

BC has extensive experience with water allocation plans. A new Act could standardize these requirements. On Vancouver Island the Ministry of the Environment prepared over 30 water allocation plans, which staff have said could easily have been rolled up into 3 plans. An example of an environmental flow requirement in one of those plans, the Englishman River Allocation Plan, is:

*The minimum flow required to sustain the fisheries resources for spawning and rearing is 10% of the Mean Annual Discharge (MAD); unless a more rigorous analysis indicates a different minimum flow requirement.*

*For streams where the natural mean monthly flow falls below 10% of the MAD, extractive licensed demands should only be allowed for the period of months when the mean monthly flow is above 60% of the MAD.*

*For streams where the mean 7-day average low flow falls below 10% of the MAD, extractive demands should only be allowed for the period of months when the mean monthly flow is above 60% of the MAD. Where the mean 7-day average low flow remains above 10%, then the 7-day low flow amount above 10% MAD is available.*

*Withdrawals from natural water bodies (lakes, ponds, swamps and marshes) supporting natural fisheries resources shall not reduce the shoal area more than 10%.*

This plan notes the reason why the standards were set:

*“Maintaining the natural stream environment and instream uses is of paramount importance for present and future generations. Maintaining water for the fisheries resource is a key factor in also providing instream flow requirements for water quality, recreational, aesthetic and cultural values.”*

That statement is even truer now than in 1994, when the plan was developed.

In addition to the basic steps outlined above, WWF-Canada submits that the Water Sustainability Act should:

#### 4. REQUIRE ENVIRONMENTAL FLOWS TO BE CONSIDERED IN ALL NEW LICENCES

The government’s policy proposal states that under a new Act, decision makers will ‘consider’ flow needs. WWF-Canada submits that a preferable approach would be for decision makers to ‘require protection of’ environmental flows in licence applications. A requirement to ‘consider’ would not set the high bar that groups such as WWF believes the WSA can and should aspire to in order to protect the precious values of BC’s watercourses.

BC could adopt similar language as in Manitoba’s water law, which states that the Minister “shall” consider scientific and other information relating to the groundwater and water body levels, and the in-stream flows, that are necessary to ensure that aquatic ecosystems are protected and maintained, and may refuse to issue a licence if it would negatively affect an aquatic ecosystem.<sup>17</sup>

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<sup>17</sup> Water Rights Act, C.C.S.M. c. W80 (Manitoba), 9.1

## 5. REQUIRE REVIEW OF LICENCES AT PERIODIC INTERVALS TO PROTECT ENVIRONMENTAL FLOWS

Licences can reserve the right to establish an environmental flow as well as the right to amend licences to curtail withdrawals during times of reduced flow. Environmental flow conditions are now included in some water licences in BC, but the conditions are rarely invoked and the licences are rarely reviewed. Newer water licences issued by Alberta Environment provide for a renewal every ten years.<sup>18</sup>

## III. DEALING WITH EXISTING LICENCES THAT COMPROMISE ENVIRONMENTAL FLOWS

There are a number of techniques that the new Act can adopt to address older water licences that do not have environmental flow protection conditions.

### *Place conditions to maintain flows on existing licences in water stressed areas*

Restrictions on licences for human uses might provide water for environmental flows implicitly as a consequence of limiting withdrawals, through restrictions on the amount, rate or timing of withdrawals at particular times of year or when flows (or some proxy, such as precipitation levels) reach a defined threshold. For example, on Alberta's Athabasca River, this will be the method used to place conditions on older water licences if an ecosystem base flow is adopted. Newer water licences on the Athabasca River already have these conditions in place.

### *Place a "sunset clause" on existing water licences*

Under New Zealand's *Resource Management Act of 1991*, a sunset clause of 30 years was set on all deemed permits (similar to prior allocation water licences) issued under earlier legislation, which will enable adherence to environmental flow requirements, specifically minimum flows, established under government water management plans. Arrangements for the conversion of deemed permits to resource consents (water licences subject to management and environmental flow conditions) may be developed before that time, and alternatively, arrangements for voluntary adherence by deemed permit holders to the minimum flows may occur. In 2021, all deemed permits, either through conversion to resource consents, voluntary arrangements, or expiry, will be subject to the minimum flows established in water management plans.

Switzerland's law requires that in cases where water rights were granted before 1992, (the date their new water law came into effect) the requirements on appropriate residual flows must be complied with when the rights are renewed.

### *Provide the power to refuse new licences or suspend existing licences due to negative effects*

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<sup>18</sup> M Griffiths, A Taylor, D Woynillowicz, "Troubled waters, troubling trends: Technology and policy options to reduce water use in oil and oil sands development in Alberta", Drayton Valley, AB :Pembina Institute 2006 at 65

Under Manitoba's Water Rights Act, a licence may be refused if, in the opinion of the minister, the action authorized by the licence would negatively affect an aquatic ecosystem.<sup>19</sup> Manitoba's law also contains another useful tool, the power to suspend a water licence for aquatic ecosystem purposes.<sup>20</sup>

## IV. PROCESS FOR DETERMINING ENVIRONMENTAL FLOWS

### *Two Stage Process- Science First*

Environmental flow needs will first be determined by scientists. However, accountable public bodies should make the final decision on the appropriate flow regime after a full public involvement process.

The problem of separating the scientific determination from the decision on what is socially acceptable is a recurring problem. Many environmental flow leaders have set up procedures which recognize these different steps in environmental flow determination.

In Michigan, the Groundwater Conservation Advisory Council developed quantitative "adverse resource impact" thresholds applicable to rivers across the state after a full stakeholder process.

North Carolina created a Science Advisory Board composed of different water use interests to assist the regulators in assessing these ecological flows.

Alberta Environment currently uses science-based instream flow needs (the quantity of water required to remain in a river in order for there to be no or minimal impact to the life cycle of aquatic species or the established ecosystem) and base flow (uncommon low flow events below which no further reduction in flow is recommended to minimize loss of aquatic species) calculations to determine environmental flow requirements.<sup>21</sup>

One model to consider is in Texas. Each area of the state has a Stakeholder Committee made up of people from diverse interest groups and an Expert Science Team made up solely of technical experts. The Science Team first develops a recommended flow regime, then the Stakeholder Committee considers their Science Team's recommended environmental flow regime, and adds their associated policy and implementation considerations. The Texas Commission on Environmental Quality considers reports from both groups and then adopts legal standards for each river and bay system.<sup>22</sup>

For less populated areas of the province, and for smaller streams, the standard will, in WWF-Canada's submission, set protected environmental flows. Advisory councils may work on work on larger waterways but he smaller the

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<sup>19</sup> 9.1(2) S.M. 2005, c. 26, s. 42.

<sup>20</sup> 9.2 The minister may suspend or restrict the rights under a licence for a specified period if (a) in the minister's opinion, (i) a groundwater level, (ii) a water body level, or (iii) an in-stream flow, is insufficient to ensure that aquatic ecosystems are protected and maintained; and (b) the minister's opinion is based on scientific information about protecting and maintaining an aquatic ecosystem of the type under consideration.

<sup>21</sup> Government of Alberta. 2010. Facts About Water In Alberta. Edmonton.

<sup>22</sup> <http://www.texaswatermatters.org/flows.htm>

stream the less practical it becomes. In those cases a public complaint mechanism is advisable to ensure environmental flows are protected even in smaller and remote streams.

### *Innovative Partnerships*

In this era of shrinking government budgets and capacity to undertake detailed scientific studies such as those required to set environmental flow standards, some US states have used innovative partnerships to achieve their goals. North Carolina's Department of Environment and Natural Resources, worked with the Wildlife Resources Commission (WRC) and the Environmental Defense Fund (EDF) to develop a technical approach for determining ecological flows. Funding from the NGO EDF was used to contract with an expert firm to develop a hydrologic stream classification system specifically for North Carolina.

The Pennsylvania Instream Flow Technical Advisory Committee (TAC) led a collaborative process with a number of public agencies to develop and implement an instream flow protection system. As reported on the state's website, the project was completed by The Nature Conservancy (TNC) with funding from the PA Department of Environmental Protection's Growing Greener Grant Program.

## V. CONCLUSION

The province made a commitment to legislate protection for environmental flows in its 2008 Living Water Smart strategy. BC is in a position to demonstrate leadership to the rest of Canada on water law. WWF-Canada hopes the proposed Water Sustainability Act will live up to the full potential of its name and lead the way for protecting environmental flows through legally binding standards.