

Environmental Flow Needs in British Columbia



Discussion Paper prepared for WWF-Canada and the POLIS Project on Ecological Governance Forum on Environmental Flow Needs in BC

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PREFACE

This Discussion Paper was commissioned by WWF-Canada and prepared for the Forum on Environmental Flow Needs in British Columbia, sponsored by WWF-Canada and the POLIS Project on Ecological Governance.

The writer is James S. Mattison, MRM, P.Eng. Mr. Mattison, an independent water resources consultant, spent 25 years working with the British Columbia Ministry of Environment, including 10 years as Comptroller of Water Rights and 4 years as Assistant Deputy Minister. Mr. Mattison also served on the Mackenzie Basin Water Board and the Columbia River Treaty Permanent Engineering Board. He is currently a member of the Board of Directors of the BC Water and Waste Association (Past-President) and is a member of the BC Environmental Appeal Board.

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The opinions expressed by the writer are opinions of the writer alone and may not be the opinions of WWF-Canada or the POLIS Project. And, of course, any errors or omissions are solely the responsibility of the writer.

Acronyms and Terminology in the Discussion Paper

BC – the Province of British Columbia

EFN - environmental flow needs

WSA – Water Sustainability Act

“Cabinet” when referring to a decision making body means the Lieutenant Governor in Council, which is actually the Premier and the Ministers. Regulations passed by Cabinet are recommended and signed by a Minister or the Premier and then become law when signed by the Lieutenant Governor.

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Environmental Flow Needs in British Columbia

INTRODUCTION

This paper provides background and an overview of the issues affecting environmental flow needs for the *Forum on Environmental Flow Needs in British Columbia*, February 1-2, 2016, where we will discuss how British Columbia can develop and implement an effective, world-class regime for management of environmental flows, with a focus on implementation. This discussion paper that is meant to stimulate ideas and provoke discussion.

Environmental Flow Needs

Water serves as a vital substance for human existence and as such has played an important role in supporting economic and community growth and wellbeing. Water is also a vital substance in the natural environment. The advance of civilization has often come at the expense of the natural environment when the water is removed from its natural state to support human endeavours. Sustainability requires that we use the natural environment in such a way that we do not foreclose options for future generations. This means that a human-caused flow change must not impair ecosystem functions. Well-functioning ecosystems are the base from which future generations will derive benefits.

Rivers and lakes have grown and changed over the centuries in the post-glacial world and ecosystems have evolved with the river changes and adapted to grow and thrive in the hydrologic regime of their river system. Ask a biologist how much water a river needs and the answer is often “all of it.” This is probably the right answer to preserve a fully intact and undisturbed ecosystem. However to leave all the water in the river generally means the human use is disallowed or unsatisfied.

The next question is often “Well, how much water can we take without doing harm?” But is that the right question? Currently we try to determine the incremental harm we are doing to the ecosystem for each increment of water we remove. And we ask ourselves if the benefit to humanity of that incremental water removal will make the ecosystem loss bearable. And, if the answer is yes, we try to mitigate that loss and we try to ensure that the harm to the ecosystem still allows a viable ecosystem to continue. This is currently the thinking that underlies environmental assessment: (1) determine the project activities that will cause impacts to the environment; (2) see if the effects are adverse and harmful and if so, determine the severity of the harm; (3) determine if the harm can be mitigated by reducing the, intensity, duration, etc.; and (4) determine the residual, unmitigated effects on the environment. The decision makers are then asked to make a fully informed decision on whether the residual unmitigated adverse effects on the environment can be justified. This is exactly the process mandated by federal and provincial legislation that was used by this writer as a member of the Joint Review Panel for the Environmental Assessment Review of the Site C Project (Canada, 2014). Both the federal and provincial Ministers of Environment decided that the project was justified in spite of “...significant adverse effects on fish and fish habitat, and a number of birds and bats, smaller invertebrates and invertebrate species, rare plants and sensitive ecosystems.” Through this process, we “justify” the degradation of ecosystems to the point of loss of function or, in the case of Site C, complete

loss of ecosystems. Sustainability requires that well-functioning ecosystems are preserved and for aquatic ecosystems that means environmental flows must be preserved.

The Brisbane Declaration states: (10th International River Symposium and Environmental Flows Conference, 2007)

Environmental flows describe the quantity, quality, and timing of water flows required to sustain freshwater and estuarine ecosystems and the human livelihood and well-being that depend on those ecosystems.

Environmental flows are one of the key determinants of a well-functioning aquatic ecosystem. This is often referred to as Environmental Flow Needs (EFN). With the passage of the *Water Sustainability Act*, British Columbia has a definition of environmental flow needs (BC, 2014).

"environmental flow needs", in relation to a stream, means the volume and timing of water flow required for the proper functioning of the aquatic ecosystem of the stream;

Unfortunately, this definition leaves out "quality" of the water as an environmental flow need, a fact that is discussed further below. Modern water law must require the determination of all environmental flow needs and must provide a means of protecting a level of environmental flows that sustains the ecosystem that the flows support. More importantly, there needs to be a governance system to allow decisions about what a socially-acceptable water use might be and to provide a method for making these decisions. This needs to be founded in the notion that well-functioning ecosystems are the base upon which future generations will also make decisions. We must strive for sustainable management decisions such that our use today still allows future generations to have well-functioning ecosystems.

Governance

Governance is the process of decision making and the process by which decisions are implemented. It really has three dimensions: authority, action and accountability. Governance includes where decisions are made, how they are made and by whom. Governments, corporations, communities, societies, even sports organizations are all examining their governance models, seeking improvement, or in some cases, seeking to understand how decisions are made and wondering how they should be made. There are many characteristics of good governance, some of which require trade-offs with others. Places like the UN and European Commission are more likely to focus on democratic governance. For example, most United Nations organizations e.g. (UNESCO, Updated 2005; UNESCAP, 2009) recognize eight characteristics of good governance: "...it is participatory, consensus-oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follows the rule of law." The World Bank (TWB, 2002) and the International Monetary Fund (IMF, 1997) focus more on economic institutions and public sector management and include in good governance things like transparency, accountability, regulatory reform, public sector skills and leadership. You can quickly conclude that "good" governance depends heavily on the value system you bring to the argument. Nevertheless, "governance" is about making and implementing decisions and good governance generally includes: inclusive participation, transparency, accountability, effectiveness and efficiency. It just helps to examine your own values when getting involved in discussions about "good governance".

When it comes to Environmental Flow Needs, there are a number of players including politicians, government staff at all orders of government (including federal, provincial, local, and First Nations

governments), communities, industry, business, and societies who all have a role. Some work collectively and some act individually. The legislation and regulations set the framework for governance. Some individuals such as the Minister and designated government staff have a formal role in decision making, many others have informal roles. There are many different scales of interaction where by an individual may affect a decision; e.g. participate in an on-line poll, attend a workshop, join an advisory board, participate in a hearing, review a decision in court, etc. In some cases, elected boards in communities have some decision-making authority such as the Okanagan Basin Water Board.

This writer does not know of, and cannot find, any place where the Government of British Columbia has published principles for good governance that it uses for guidance in crafting legislation for decision making in the environmental sector. In a report on good governance, the BC Auditor General says there is no generally accepted set of governance principles for the public service but has listed the five key principle underpinning good governance to be used in auditing a civil service organization (BC Auditor General, 2008). Those key principles are: accountability, leadership, integrity, stewardship and transparency. The Stewardship principle is particularly interesting:

Stewardship is the act of looking after something on behalf of others to protect or improve its sustainability. In the public sector, it relates to the way public officials exercise their powers on behalf of the public they serve. ...A public sector organization demonstrates stewardship by maintaining or improving its capacity to serve government and the public interest over time. This applies to ensuring financial sustainability and the efficient and effective management of resources, as well as maintaining the trust placed in the organization.

In the Discussion Section below, decision making as proposed in the *Water Sustainability Act* will be examined.

History and Legislative Context for Environmental Flow Needs in BC

Except after a revolution or some country-changing event, all legislative change comes about as a result of an almost evolutionary process. Acts are amended through time as human societies change and grow. Even completely new Acts are based on the foundation of the legislative scheme that came before. This is certainly true of the *Water Sustainability Act* (WSA). An understanding of the history of water use management in British Columbia helps to explain why the new Act looks the way it does.

Industrial water use began in British Columbia with the gold rush in 1858 and water use regulation by government began at that time to prevent conflicts among miners in the gold fields. The first *Water Act* came into force in 1909 and was much modified in the 1930s. All this legislation basically ignored the stream and really managed people with respect to their access to water and how they used it and how they affected others. In 1960, the *Water Act* was simplified by moving much of the procedural and administrative aspects into regulations, leaving a lean Act that empowered the Comptroller of Water Rights to make all water use decisions, with supporting advice from Regional Engineers. A provision in the Act prohibited putting into a stream "...any sawdust, timber, tailings, gravel, refuse, carcass or other thing or substance..." if ordered not to do so. This was the only water quality protection in BC until the *Pollution Control Act* (later *Waste Management Act*) was enacted in 1967 but the old provision in the *Water Act* was not repealed and still exists.

The federal *Fisheries Act*, which dates back to 1868, was amended in 1977 to bring in habitat protection provisions for fish habitat. **Section 35(1)** made it an offence to carry on any work or undertaking that

resulted in the harmful alteration, disruption or destruction of fish habitat. However, **section 35(2)** gave the Minister of Fisheries and Oceans discretion to authorize harming, disrupting or destroying fish habitat “...by any means or under any conditions.” Nevertheless, **Section 35(1)** gives some protection to streams that are fish bearing. Pollution of fish bearing water was also protected by **section 36(3)** which prohibited the deposition of a “...deleterious substance of any type in water frequented by fish...” Power to authorize pollution has also been given to the Minister.

After the creation of the BC Ministry of Environment in 1978, changes to the *Water Act* brought in protection for streams and streambanks by prohibiting “changes in and about a stream” without approval. In 1984, Regional Engineers became Regional Water Managers and were given autonomy to administer the *Water Act* within their region. Trans-boundary decisions, intra-regional decisions and major project water use decisions were still made by the comptroller. In the early 1980s, provincial environmental assessment processes began to be formalized through a series of Major Project Review processes. Regional planning processes also began in British Columbia at this time and in both of these processes, increasing attention was being paid to protection of water resources. Probably because of these pressures combined with the activities of the federal Fisheries Officers, Regional Water Managers began developing policies for consideration of instream flows in water licensing decisions.

Water Act Modernization

Attempts were made to modernize the *Water Act* in the 1990s, most notably with *Sustaining the Water Resources* in 1996, which was a series of nine policy papers aimed at different aspects of water including groundwater, floods, dike management, water allocation policy, etc. A new act was proposed and much consultation took place but little in the way of legislation followed. In 1996, the *Water Protection Act* was passed, which required water licences to be issued only for water use in British Columbia, prohibited bulk water removal from British Columbia, and prohibited large scale water transfers from one major watershed to another within the Province. In 1997, the *Fish Protection Act* was passed. This Act prohibited dams on protected rivers (17 were named in the Act), allowed for designation of sensitive streams for sustainability, and authorized the Minister to regulate the use and diversion of water regardless of the *Water Act* if the Minister considers “...that, because of a drought, the flow of water in a stream is or is likely to become so low that the survival of a population of fish in the stream may be or may become threatened.” This authority was used during the very dry years of 2003 and 2004 and again in 2014. In 2009, the BC government issued a policy document, which was signed by the Premier and the Minister of Environment, called *Living Water Smart*. It was aimed improving business practices associated with water, promoting conservation of water, and preparing for climate change. Forty-five government commitments were made in the document including the following which are important to this discussion paper:

- 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 smart.
- Legislation will recognize water flow requirements for ecosystems and species.
- The Groundwater Protection Regulation will protect the quality and quantity of our groundwater.

- Government will work with the private sector and support communities to conserve and restore stream function.
- Wetland and waterway function will be protected and rehabilitated.
- Government will provide incentives for restoration of streams or wetlands.
- Government will continue to work towards preserving First Nations social and cultural practices associated with water.

Water Sustainability Act

More than four years of consultation followed *Living Water Smart*, leading to the passing of Bill 18, the *Water Sustainability Act* (WSA) on May 29, 2014. The WSA delivered on part of the commitment to modernize BC's water laws and it also delivered on a commitment to regulate groundwater use. Although empowered in the *Water Act* of 1960, and well drillers and well construction were regulated in 2004, groundwater use was not regulated until the passage of the WSA in 2014 and still is not regulated until those provisions of the WSA come into force. Appendix A contains a summary of changes to the current *Water Act* that the WSA will bring about when Bill 18 is brought into force.

Water Legislation in BC evolved slowly from the gold rush days to the *Water Act* of 1909 to the *Water Act* as it was by 2015 to the (hopefully) proclamation of the *Water Sustainability Act* of 2016. It was a slow process of change, matching the needs of the time. While the WSA is not perfect, it is a significant step in managing for sustainability of the water in its natural state and for protecting the ecosystems it supports, instead of mainly managing for orderly diversion and use of the water.

The old *Water Act* and the new WSA both contain a variety of decision makers. In the *Water Act*, certain powers are retained at the political level. The provincial Cabinet make the regulations and the Minister may designate an area for a water management plan and set its terms but must bring it to Cabinet to be approved. The vast majority of the decisions were seen as technical ones and were originally, and entirely, left to the comptroller of water rights. After 1984 regional water managers were created and given similar powers to that of the comptroller except for limited exceptions such as calculating fees and sending invoices for water rental. Engineers under the *Water Act* were given authority to write orders and take action to prevent failure of works at this time as well. Sometime after 1999, officers were created under the *Water Act* and given some authority to inspect and approve changes in and about a stream as well as others duties. Conservation officers were also named under the *Water Act*.

In the WSA, Cabinet still makes the regulations (this is normal) and only Cabinet can set water objectives. The Minister has an expanded role in water planning and in declaration of drought. In streamlining and modernizing of the language that was done in writing the *Water Sustainability Act*, the language simply refers to a "decision maker". Decision maker is defined in the WSA as the person authorized to make the decision and the person who is making or has made the decision. The comptroller (includes deputy comptroller), regional water managers (includes assistant regional water managers), engineers and officers still exist in the WSA. The Minister appoints the comptroller and the water managers; the comptroller appoints engineers and officers (except Conservation Officers who are appointed under different legislation). The comptroller may exercise any power or perform any duty given under the WSA to a water manager, an engineer or an officer. Similarly a water manager may perform any duty given to an engineer or an officer. The roles and duties of decision makers in the WSA are explained below with respect to environmental flow needs.

For water sustainability planning and for water objective setting, there is authority for carrying out public consultation and there are advisory roles but there is no shared decision making. However, there is also an ability to delegate the entire preparation of a plan to “...another person as the person responsible for preparing the proposed plan”. The entire plan could be prepared outside of government but the final decision on accepting the plan and ordering its implementation is left to the provincial Cabinet. There is also authority to consider the results of other Provincial government, local authority and First Nation government strategic, operational and land or water use planning processes in relation to land or water within or adjacent to the plan area.

Much of the detail related to implementation of the new *Water Sustainability Act* is to be provided in regulations and operational policies. Due to the complexity of the new WSA and the number of proposed regulations, government is taking a phased approach to implementation, which includes the release of policy papers followed by meetings with key stakeholder groups and soliciting public comment. Initial consultation took place on licensing groundwater use, protecting groundwater, dam safety and strengthening compliance. The politics of the day pushed water pricing to the fore and it became the next policy that was publically reviewed. The WSA will come into force by regulation. It was initially expected that the Act might be brought into force “after April 2015” but government is now saying it “...will come into force early in 2016”.

DISCUSSION Part 1: Key Elements of the Water Sustainability Act

The WSA explicitly delivers on the *Living Water Smart* commitment that “Legislation will recognize water flow requirements for ecosystems and species”. In addition to the explicit recognition in **Section 15**, which is new, there are other places in the WSA where environmental flows can be recognized and protected. Authority is also given to temporarily protect flows in times of drought and to order mitigation measures where water removal is likely to have significant adverse impacts on a stream. The University of Victoria’s POLIS Project on Ecological Governance issued a policy paper on the WSA in November, 2015 (Brandes et al., 2015). From this work, POLIS staff adapted a one-page document that lists the 10 mechanisms within the WSA that POLIS suggests would help provide for environmental flows (attached as Appendix B). This writer also adds to this list the inclusion of protected rivers and the prohibition of bank-to-bank dams. Not each of these mechanism are equally important for protecting environmental flows, but all are beneficial. In the following sections, this writer describes each legislative authority or requirement in the order he thinks they will be most effective.

Environmental Flow Needs

Section 15 of the WSA states that the decision maker (DM), who in these decisions is either the comptroller or regional water manager, must consider the environmental flow needs of a stream in deciding on a new licence or approval application on stream or an aquifer the decision maker considers is reasonably likely to be hydraulically connected to that stream. “Must consider” is legal language that has been judicially reviewed many times. When this comes into force, it puts a positive duty on the decision maker who must not make the decision without considering EFN. He or she must determine if there is an environmental flow need, if so, determine if it is a water quantity need and then quantify it. Generally EFN needs will only refer to water quantity but see the discussion below about water objectives that may allow for water quality considerations. The decision maker then determines if the application under consideration will have an impact on the environmental flow need thus specified. Furthermore, the decision maker should document how he or she made this

consideration. The decision must be made in “...accordance with any applicable regulations,” which have not yet been written.

Section 127 says that the Cabinet can pass a regulation prescribing methods of determining the environmental flow needs of a stream. **Section 15 (2) (b)** states that the decision maker “must determine” in accordance with the regulations the environmental flow needs of the stream. If Cabinet has prescribed a method, the decision maker must use it. Otherwise, he or she may choose any suitable method. The decision maker also has explicit authority under **Section 15 (2) (a)** to require the applicant to provide any information, reports and assessments that the decision maker directs for the purpose of determining the environmental flow needs of a stream. This is the first time that such explicit authority has been given to decision makers dealing with applications for water use licences and approvals. In the old *Water Act*, the decision maker could require additional “plans or other information”, which clearly covered information about the applicants’ intentions. Many decision makers have stretched this authority quite far (including this writer) but many applicants in the past have pushed back when they were asked for environmental information they thought was not directly related to their application.

This section is the formal place where EFN is considered in a water licence application. It is an important decision, especially where the first determination of EFN on a stream may set a precedent for further decisions on that stream. But this is not the only place where environmental flow needs may be considered and it may not be the most important place.

Water Objectives

WSA Part 3 is entitled: PROTECTING WATER RESOURCES. **Section 43** is about setting water objectives to sustain water quantity, quality and ecosystems. Cabinet has the authority to make the regulations setting the Objectives. There can be objectives for water quality and quantity for specified uses of water (protecting drinking water for example) or for water quality and quantity required to sustain aquatic ecosystems. The importance of this section is that it goes outside of the stream and can specify factors and criteria to apply in evaluating the impacts of a land use or resource development on water objectives that are established (**section 43(1) (b)**). There can also be regulations about measures to address impacts of proposals on the objectives.

Water objectives are quite broad, they may be set for a watershed, stream, aquifer or other specified area or environmental feature. But they must be in order to sustain water quantity and quality required for specified uses of water and/or water quality and water quantity required to sustain aquatic ecosystems. This appears to be a mechanism whereby, if an environmental flow need becomes an objective, the objective may be constructed so that it must be considered not only by a decision maker in making an allocation decision, but by any specified public official, even in local government when undertaking land use planning.

This is one mechanism that begins delivering on the government promise: “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.” There is nothing like an objective ordered by Cabinet through a regulation to help land and water managers know, and land and water users understand, what is required of their proposed activity to ensure stream health.

Of course that is also the rub. Environmental regulations that constrain land development or industrial activity have always been difficult to get through Cabinet in BC. But perhaps a government that passes such legislation and brings it into force (soon we hope) may also intend to use it.

While **section 15**, Environmental Flow Needs, does not directly point at **section 43**, Water Objectives, it appears as though an environmental flow need could be set as a water objective and it would simplify the decision maker's job where he or she "...must determine, in accordance with any applicable regulations, the environmental flow needs of the applicable stream." If an EFN was specified for a stream in an Objective approved by Cabinet, the decision maker would only have to consider it under **section 43 (2) (a)** if that was required by the regulation and then determine if it was an appropriate EFN for the decision he or she was about to make. The decision maker may even be required to use an EFN that was in an Objective if the Objective required it to be used as empowered under **section 43 (2) (b)**. The decision maker may only consider water quality in an EFN decision if water quality is included in an EFN specified in an objective approved by Cabinet.

Water objectives are a powerful tool and could help integrate land use decisions with aquatic ecosystem protection. However, to be effective, they must be specific to the water body for which they are developed and they must be developed with some scientific rigour. This takes time and data, and requires money. Because they also require a Cabinet decision, they will not be something that can be done routinely. And, given the vast number of rivers and streams in British Columbia (there are over 291,000 unique blue lines on the 1:50,000 map sheets), this writer does not expect there will be many objectives set. They can be applied best in a watershed or watersheds that are subject to mining or oil and gas activity, perhaps supported by a cumulative effects assessment. They might also be useful in a watershed with a hydroelectric proposal, or other major project, where some base-line studies can be done before construction to allow monitoring during operations to determine their effectiveness.

Water Sustainability Plans

Division 4 of Part 3 of the WSA from **section 64** through **85** cover water sustainability plans. This is a much updated and strengthened section from the *Water Act* that covered water management plans. The WSA authorizes the Minister to designate an area for a planning process (**section 65**), establish a plan development process (**section 66**), and limit the scope of the plan by restricting the issues to be considered or the recommendations that may be made (**section 67**).

Some interesting changes have been introduced here. The planning process may be initiated (**section 65**) "...on request or on the Minister's own initiative." Who may request such a process is not specified but it appears to allow an individual or a community or others to request a planning process. A request to the Minister must be made in the prescribed manner, if any, and must include prescribed information, if any. Until the regulations are developed, there is neither prescribed manner nor prescribed information. The Minister may designate an area for a plan if the Minister considers that the plan will prevent or address (a) conflicts between users, (b) conflicts between the needs of water users and environmental flow needs, (c) risks to water quality, or (d) risks to aquatic ecosystem health or if the plan will identify restoration measures in relation to a damaged aquatic ecosystem, or in other prescribed circumstances.

The contents of the terms of reference for a planning process are specified in **section 68**. It is interesting here that the process for public and stakeholder communications and consultations must be included (**section 68 (1) (f)**) and if the responsible person for the plan is not the government, then a process for

consultation with the government throughout the plan development process must be included (**section 68 (1) (g)**). This process clearly contemplates planning process being completed by individuals or groups outside of government. In addition, the plan terms of reference may include not only considerations relating to water in a stream, groundwater and surface water runoff not in a stream (**section 68 (2) (a)**) but also uses of land or resources that affect the water referred to (**section 68 (2) (b)**). This is the first time this writer has seen land use planning in legislation that is to be done from a perspective of the effect of the land use on water. This is potentially a very powerful provision.

The Water Sustainability Plans referred in **section 64** through **85** empower many more actions than might be necessary to establish and protect environmental flow needs. However, the planning process is clearly designed to help gain a consensus on choosing an EFN where there is a conflict between flow protection and off-stream water use. **Section 65 (1) (a) (i) (b)** allows the Minister to initiate a plan if the Minister considers that a plan will assist in preventing or addressing conflicts between the needs of water users and environmental flow needs.

The only real experience with major water planning in British Columbia is with the Water Use Plans prepared by BC Hydro. This highly successful program (for an overview see Mattison, 2014) was designed to change the operations of BC Hydro's dams to get environmental, social and recreational benefits from structures that were built to maximize power generation and flood control. The success came from a large expenditure of time and money to fully involve stakeholders groups in an inclusive and transparent process. The planning involved a partially delegated structure, the scale of a river basin affected by a hydro facility for decision making, extensive participation beyond the proponent and the regulator, a collaborative process and science-based decision making. The process clearly demonstrated that participation of a wide spectrum of groups who care about water management adds value in formal decision making.

Another reason to look at the Water Use Planning Process is the involvement of First Nations. First Nations were involved early in the design of the program to ensure that they were involved where, when and how they chose in the program. First Nations involvement was done without prejudice to any other discussions involving aboriginal or treaty rights, including court cases or other negotiations the Nations may have been involved in with BC Hydro or the BC government. Government-to-government consultations were held with all affected nations both before the process began and after the planning was completed before implementation decisions were taken. First Nations were told at the outset that this process would not solve their historical grievances with the projects (flooding of cultural places, resettlement of populations, loss of traditional fisheries) but that it could improve matters from an operational point of view and the then comptroller of water rights (this writer) assured the participating Nations that no decision would be taken that would in any way make things worse for them. Consensus was achieved with the First Nations on all 24 planning projects.

Protected Rivers and Sensitive Streams

The *Fish Protection Act* (FPA) of 1997 named 17 rivers on which it was prohibited to construct bank-to-bank dams and gave authority for Cabinet to make regulations to prescribe additional streams as protected rivers. The *Water Sustainability Act* will repeal the first 11 sections of the *Fish Protection Act*, which will be renamed the *Riparian Areas Protection Act*. (**Sections 5** and **8** to **11** of the FPA were never in force.) Division 2 of Part 3 of the WSA is called "Stream Protection" and contains **Sections 44** through **47**. **Section 44** defines "bank-to-bank dams" as in the *Fish Protection Act* and "protected river" now means a river set out in the schedule to the WSA, rather than in the Act as it was before. All 17 rivers designated as "protected" under the FPA are in the schedule. **Section 45** retains the former prohibition

on dams on protected rivers. In **section 129 (1) (a)**, Cabinet may make regulations to amend the schedule to designate a stream as a protected river. Interestingly, **section 129 (2)** says that a stream so designated remains protected until the schedule is amended by an Act to delete the stream from the schedule. This means that Cabinet can add a stream to the protected list by regulation but it cannot remove one; it must go before the Legislature for debate. Formerly with the protected rivers named in the FPA, it also took an Act to add a sensitive stream.

The *Fish Protection Act* allowed for designation of sensitive streams for fish sustainability, and authorized the Minister to regulate flows. Fifteen such streams were designated in a regulation to the FPA and are now all found in the schedule to the WSA. The language of the FPA regarding sensitive streams (formerly **sections 6 and 7** of the FPA) are now, somewhat amended in the regulation making powers of the WSA. **Section 128 (1)** empowers Cabinet to designate a stream, including specified tributaries and specified aquifers that are likely connected to the stream, as a sensitive stream if Cabinet "...considers the designation will contribute to the protection of a fish population whose sustainability is at risk because of damage to the aquatic ecosystem of the stream". This is interesting language because it seems that the stream can only be designated if the sustainability of a fish population is at risk in an already damaged aquatic ecosystem. Thus this is not a preventative provision so much as it is a reactive measure. However, it still has value because regulations can be established regarding information that must be provided to decision makers if an application is received on a sensitive stream, criteria that the decision maker must apply in making a decision, and terms and conditions that apply to any licence or approval that is granted including mitigation measures, diversion and use of water, and monitoring and reporting.

Mitigation

There is a new authority provided where significant adverse impacts may be avoided in **sections 16**. Decision makers may require an applicant to submit a proposal for mitigation measures where the decision maker considers that a diversion and use of water or changes in and about a stream are likely to have a significant adverse impact on the water quality, water quantity or aquatic ecosystem of a stream or aquifer, a stream channel or other uses of water from the stream or aquifer. The decision maker may impose terms and conditions in any licence or approval issued requiring implementation of the proposed measures. If the decision maker considers that the effects cannot be addressed by the mitigation measures proposed but can be addressed by other mitigation measures taken on a different part of the stream or aquifer than the part to which the proposal relates, the decision maker may impose under **section 14 (1) (f)** terms and conditions requiring the applicant to take compensatory mitigation measures that meet the prescribed criteria, in place of or supplemental to any mitigation measures proposed by the applicant, on a different part of the stream or aquifer to which the application relates.

On sensitive streams, an application for an authorization or approval must include mitigation measures (**section 17 (2)**) that the applicant proposes to take to mitigate any adverse impact on a protected fish population resulting from granting the application in relation to the sensitive stream.

Temporary Orders

There are also provisions for dealing with water shortages through temporary orders. A "critical environmental flow threshold", means the volume of water flow below which significant or irreversible

harm to the aquatic ecosystem of the stream is likely to occur. There is no procedure prescribed for determining a critical environmental flow threshold but the Minister may establish or ask an advisory board to provide advice in relation to methods for determining critical environmental flow thresholds (**section 115 (1)(b)**). Nor is there any requirement for determining a critical environmental flow threshold in advance of a water shortage. This lack of requirements is probably intentional to empower the Minister to act quickly, especially in an emergency or unexpected situation.

If the Minister considers that one or more streams in an area have fallen or are at risk of falling below their critical environmental flow thresholds, the Minister may make a temporary order declaring a significant water shortage in the area designated in the order (**section 86 (1)**). The Minister's order must specify a term of not more than 90 days (**section 86 (2)**). Whether or not the Minister's order has expired, Cabinet may make an order declaring a significant water shortage in the area designated in the order (**section 86 (3)**).

If there is an order under **sections 86 (1) or (3)** in place, the comptroller must determine the critical environmental flow threshold for each stream that is within the area of the order (**section 87 (1) (a)**), that has water being diverted from it (**section 87 (1) (b)**), and for which the comptroller considers that enforcing the precedence of the stream's critical environmental flow threshold under **section 22 (9)** will assist in preventing significant or irreversible harm to the aquatic ecosystem of the stream (**section 87 (1) (c)**). **Section 22(9)** says that if an order has been made and if the comptroller has determined the critical environmental flow threshold for the stream, all in accordance with the above procedure, then the amount of that critical environmental flow threshold for the stream has precedence over the rights of other licensees on the stream and of others who may be using water without a licence such as unregistered domestic surface water use and from domestic wells. This then allows an engineer under the WSA to enforce the precedence of the rights, which essentially means to order the water users to stop using water according to their precedence on the stream except for "essential household use" of not more than 250 litres per day.

This is fairly convoluted as the Minister must consider that streams have fallen or are at risk of falling below their critical environmental flow thresholds without having had the threshold determined by the comptroller and the comptroller is not obliged to determine that threshold with first having an order in place. However the whole point is to allow the Minister to act without having to go through a lot of process. These are unusual steps to take and would only be taken in a time of need. The Minister only need consider that there is a risk and she can make the order. Then the comptroller must get busy and determine the threshold and then, determine what action needs to be take. Hopefully before there is any need to implement these sections, the Minister will have created an advisory board to determine a methodology for setting a critical environmental flow threshold to at least give the comptroller a place to start.

There is one other power that is in place to protect fish populations in dry times. If the Minister considers that the flow of water in a specified stream is or is likely to become so low that the survival of a population of fish in the stream may be or may become threatened, the Minister may make an order respecting the diversion, rate of diversion, time of diversion, or use, including storage and time of storage, of water from the specified stream, or a specified aquifer hydraulically connected to the stream, regardless of the precedence of the rights on the stream (**88 (1)**). The Minister must consider the needs of agricultural users before making such an order (**88 (2)**) and must specify a term in the order

(88 (3)) but otherwise is free of any process requirements. Once the order is made, it would normally be up to the regional engineers and officers to enforce it.

Advisory Boards

Advisory Boards may be an important piece of the implementation of environmental flow needs determination because section **115 (1) (a) and (b)** provide for boards to provide advice on establishing water objectives and methods for determining environmental flow needs or critical environmental flow thresholds. Their lack of decision making power puts them outside of the governance structure but their influence may be significant. A properly empowered board with a mix of scientists and practitioners, managed by a strong facilitator, could define environmental flow needs throughout the Province, could determine critical areas and set thresholds in those areas, and could raise public consciousness about the need for environmental flow protection and the importance of the goods and services provided by a properly functioning aquatic ecosystem.

Authority for the Minister to establish Advisory Boards is hidden away in Part 5 – General. **Section 115** states that the Minister may appoint “boards”, not “a board”, so it may be that more than one board is being contemplated. Certainly, the skills needed on a board to deal with matters such as establishing critical flow needs are different from the skills needed on a board to oversee the qualifications of well drillers and pump installers. In any case, these are “advisory” boards; they have no independent power for investigation or action such as the Forests Practices Board or the Environmental Appeal Board. These advisory boards are to “provide advice in relation to...” establishing water objectives, methods for determining environmental flow needs or critical environmental flow thresholds, qualifications for well drillers and pump installers, standards and best practices and any other matters under this Act.

Because the chairs and boards thus established are appointed by the Minister, it is expected that they will be providing advice to the Minister. However, the common practise would be for that advice to come through the chair via a letter or report addressed to the Minister. It is also common practice to appoint one or more civil servants to such boards, and this is certainly contemplated in **section (3)(b)** where public service employees, who are advisory board members, are denied remuneration as this would normally be an appointment that was part of their regular employment duties.

It is important to distinguish advisory boards formed under **section 115** from technical advisory committees formed under **section 66 (2) (b) (ii) or (c) (ii)**. Both the advisory committees and the advisory boards are established by the Minister but, while the Minister appoints advisory board members, it is not clear that the Minister necessarily appoints technical advisory committee members. Certainly, under **66 (2) (c) (ii)**, where the government is not the “responsible person” for preparing the plan, the Minister’s order establishing the plan would require the responsible person to establish the technical advisory committee and thus, seemingly, appoint the members. It is not clear that the technical advisory committees would have any decision making-power but it would be possible to empower them for some aspects of the plan in the terms of reference, subject to the approval of the Minister.

Other Mechanisms

There are some other powers that may help strengthen the management and protection of environmental flow needs. **Section 124 (4) (d)** of the WSA provides for Cabinet or the Minister to designate an area in just about any way they want as long as it adequately describes the area. It could

be a stream, an aquifer, a watershed, geological formation, or a map, a plan or a legal description. Then, **section 124 (4) (c)** empowers Cabinet or the Minister to make different regulations for different classes of water, watersheds, natural resources, etc. This basically empowers area-based regulations that could deal with geographically specific problems. For example, the vineyards in the Okanagan have unusual water requirements in that the irrigation usually stops when the grapes are ripening to stress the vines and concentrate the sugars in the grapes. After harvest, the grapes are irrigated heavily to hydrate the vines before winter. This places a late season irrigation demand (October into November) at a time of very low flows in the Okanagan River. A specific regulation could be crafted for this area to assist the water decision makers to manage this water use.

Two other mechanisms are newly empowered in the WSA that should help with protection of EFN. **Section 1** defines “beneficial use” as using water under an authorization as efficiently as possible and in accordance with the regulations and in the manner and times authorized. **Section 30 (1)** states that a person who diverts water must make beneficial use of the water diverted. **Section 30 (5)** empowers the decision maker to order the licensee “...to take measures to meet the level of efficiency of water use and conservation of water specified in the order.” There have been many instances in the past of inefficient water use that were wasting water (leaking pipes, leaks and evaporative loss from open ditch diversions, large gun sprayers used in the heat of the day) over which the decision maker had no explicit authority to improve. **Section 30** provides a number of opportunities to improve efficiency including requiring beneficial use declarations, conducting water conservation audits, requiring water use information, and publishing such information. Neither the order requiring a beneficial use declaration nor the direction to submit information is appealable to the Environmental Appeal Board (**section 30 (9)**).

Finally, **section 23** provides a thirty-year review of licences terms and conditions. In 2004, the *Water Act* was amended to require that all new water licences for hydro power expire after 40 years. The licensee could apply to renew the licence before it expired, but the application to renew would be as though it were a new licence. This allowed for a complete relicensing of the power plant under any new terms and conditions necessary. **Section 23** in the WSA is not an expiry and renewal, but it does require a licensee to submit to a licence review every 30 years and it allows new terms and conditions to be inserted in the licence for more efficient use of the water. The decision maker may require the licensee to reduce the maximum rate of diversion, to alter the time of diversion and use, to construct, repair, alter, seal, deactivate or remove works, and to adopt a more efficient practice.

Section 23 works with **Section 121** which provides that no compensation is payable by, and no legal proceedings may be commenced against, the government or any other person for loss or damages from an effect of, among other things, “...a change of or the imposition of new terms and conditions on an authorization” (**section 121 (1) (l)**) that come about during a licence review. The changing of the terms and conditions are not seen as an expropriation of rights. The licensee is still entitled to the right to divert and use the quantity of water originally specified in the licence; only the terms of use are allowed to be changed. In contrast, if a proposed Water Sustainability Plan submitted to the Minister under **section 74 (1)** recommends a significant change in respect of a licence or a drilling authorization and the holder of the licence or drilling authorization has not consented to the change, the proposed plan must be accompanied by a statement of any available source of funding to pay compensation or for compensatory measures for the involuntary significant changes (**section 74 (3) (c)**). This would be a case in which rights were proposed to be taken and for which compensation would have to be paid.

DISCUSSION Part 2: IMPLEMENTATION

There are additional factors that affect even the most well-designed governance system when it comes to implementation. Each is discussed below.

Environmental Flow Determination

The science of determining environmental flows is established but, like much science, is developing and changing as our understanding of ecosystem processes and populations grows and our technology improves. Every decision to set a flow to meet an EFN is a trade-off between water use and ecosystem health. For each decision, a model must be chosen, data gathered on natural flow and ecosystem function, impacts of flow reductions determined, and results prepared. However, a diligent decision maker will want to know what assumptions are made in getting to the results and which model, or models, were chosen, and why. In addition, it is best to also understand what the confidence is in the data and how sensitive the results are to the assumptions. The involved community and stakeholders need to know and trust that the decision maker has used an appropriate scientific method.

In June of 2015, the Executive Director of the Water Protection and Sustainability Branch and the Director of the Water Management Branch signed an Environmental Flow Needs Policy (Government of British Columbia, 2015). The policy applies to "...all applications for a water licence or an approval for short-term water use administered by MOE or FLNRO, applications administered by the OGC, and to certain amendments to existing authorizations." The policy describes a coarse screen for assessing risk to environmental flows in decision making where the origin of the water is a stream as defined in the *Water Act*. This policy is not a method of determining the environmental flow needs but rather is a framework for assessing risk and additional analysis may be needed, including identifying site-specific environmental flow thresholds.

The policy establishes 3 risk management levels by evaluating stream sensitivity, stream size, cumulative withdrawals from the stream, and hydrological characteristics of the stream. Combining this with information about fish presence, fish sensitivity, and other species sensitivity, allows the decision-tree framework to help determine what additional studies and information is required for decision making. The presence of sensitive species such as species at risk or sensitive habitats may require special consideration or the collection of site-specific information before a decision on water withdrawal can be made. Risk management measures may vary for short-term approvals compared to licences and may vary in relation to withdrawal amounts.

The policy explicitly recognizes that in situations where a water allocation decision will significantly impact on environmental flow needs, the decision maker may refuse the application or specify conditions for water use. This was always the case in the *Water Act*, but the policy will help formalize the documentation of the justification for such a decision. It should also help ensure consistent and transparent decision making across the Province and within the different agencies.

The policy also recognizes that an adaptive management approach that includes monitoring and site-specific studies will lead to refinements of the policy. An Advisory Committee on environmental flow determination that works transparently and that publishes its work would be a great assistance in informing future policy changes and assuring all involved that the decision maker was in fact using appropriate methodology.

Uncertainty in Decision Making

The amount of information available will constrain what can effectively be done to apply an environmental flow requirement in specific decisions. Management of uncertainty may be as simple as risk avoidance, which may mean postponing the decision until more research is done and more data collected. This is never a popular response with government but it can be the right decision in sensitive areas or where species at risk are involved. In some circumstances, best management practice coupled with a monitoring program might be the best choice. An example of this is allowing removal of a fixed percentage of the mean annual flow and then monitoring the ecosystem response over a fixed period of years, with an adjustment to the percentage or stopping the withdrawal of water depending on the ecosystem response. Adaptive management takes this approach as well but includes pre-disturbance base-line studies along with continuous monitoring of key indicators for the life of the water withdrawal and adaptive changes to the withdrawals depending on the observed response. Environmental zoning can be used in the process of objective setting with areas zoned for no water removal and other areas where small or medium sized removals may be permitted without the need for setting an EFN depending on the ecosystems and the development pressure. The sensitive stream designations where dams have been prohibited are an example of this.

Climate change also will affect how decisions must be made. A decision made today might be quite wrong in ten years' time. Trends in climate data must be considered and factored into any decision process. Adaptation to climate change requires the ability to review past decisions and new decisions that may be susceptible to climate change should have provisions for review built into them.

Institutional Capacity

Environmental flows will only be protected if there are people with the scientific capacity and adequate funding to collect, store, analyze and synthesize environmental data. There must be trained staff to make informed management decisions, and tools for the integration of complex biological knowledge into the decision, to monitor compliance with those decisions as well as monitor the ecosystems where there may be impacts from those decisions, and to take action to enforce compliance when and where necessary. As part of the implementation of the WSA, some fees for surface water use will be raised and new fees will be introduced for large groundwater withdrawals. Some of the funding must be dedicated to data collection, management and analysis through the recruitment of appropriate staff and equipment to manage with this new and significant workload.

The above issues, the science of environmental flow determination, dealing with uncertainty, and ensuring institutional capacity are outside the scope of this Forum. They are issues that could each be a Forum on their own. But each one of these issues can and will affect decision-making around ascertaining environmental flow needs and each needs to be kept in mind by the decision maker and somehow dealt with to his or her satisfaction.

First Nations

The *Water Sustainability Act* is almost silent on First Nations except for recognizing the notion of a water reservation for First Nations, which comes from the *Water Act*. It is this writer's experience that many First Nations have a connection to the water that is as powerful as their connection to their traditional land. For many First Nations, certain water uses and fishing have been a sustenance practice as well as a cultural and spiritual practice. It can be expected that First Nations will support environmental flow protection but it should also be expected that they will insist on their right to be consulted on the

determination of environmental flow needs. A means of incorporating traditional ecological knowledge in this determination needs to be found. And appropriate deep thinkers among the First Nations people need to be appointed to Advisory Boards if they are willing to serve. None of this needs be in the WSA but environmental flow needs cannot be protected without the active participation and support of First Nations people.

CONCLUSIONS

The purpose of this paper is to review the current and proposed state of environmental flow management with a view to helping implement an effective, world-class regime for management of environmental flows. The paper began by examining the governance model that is implicit in the new *Water Sustainability Act*. The paper suggests we need to think about our values and decide which characteristics of good governance are of paramount importance. Then we need to look at the decision-making process as set out in the legislation and see if it fits with our good governance model. There are many different decision-making processes in the WSA, from the determination of a critical environmental flow to the adjudication of a water licence application. Almost all come down to a single decision maker, from the Minister to the comptroller to an officer, etc. This is efficient and it provides for accountability. However, the writer questions if it is a sufficiently inclusive process.

The WSA is a huge step forward in the fact of the explicit recognition of environmental flows in the legislation, although it is concerning that the water quality component of EFN is not explicitly a part of the definition of EFN in the WSA as it is in the Brisbane Declaration. It is uncertain to what extent a decision maker could refuse an application or set conditions for a water quality parameter (e.g. refusing an application to ensure a high late-summer flow to help maintain a cooler temperature for fish). However, water objectives may include water quality parameters to sustain aquatic ecosystems and a decision maker must consider the water objectives if the objective so requires. This might be a place to include water quality in an EFN decision.

It is unknown to what extent that First Nations will be involved in water decision making. It is clear, however, that they increasingly want to be involved. There is scant explicit mention of First Nations in the WSA. However, there is authority in the WSA for First Nations to be empowered to manage water in their traditional territory, especially where they put a water sustainability plan in place. It is this writer's experience that First Nations recognize the connectedness of water and understand that water flows into and out of their territory. Any system of water management must recognize the decisions made across the political boundaries. The Nisga'a Treaty explicitly recognizes this, with the water legislation being used by Nisga'a decision makers on Nisga'a lands. This may be one model that could be used in future.

The *Water Sustainability Act* has many new authorities and requirements that are designed to help protect environmental flows to sustain aquatic ecosystems. It is at the implementation stage, however, that the effectiveness of the legislation will be determined. There are still opportunities to ensure environmental flow needs continue to be met as the regulations, policies and procedures are being developed.

APPENDIX A – Explanatory Note

The Explanatory note that accompanied the government news releases after Bill 18 was passed stated as follows: Bill 18 repeals most of the *Water Act* and enacts the *Water Sustainability Act* in substitution. The *Water Sustainability Act* modernizes the language of the *Water Act* and does the following:

- re-enacts the regulatory scheme for the diversion and use of stream water and applies that scheme to both stream water and groundwater;
- authorizes the establishment of water objectives and requirements that water objectives be considered in decision making under this and other enactments;
- mandates the consideration of the environmental flow needs of a stream in licensing decisions;
- moves to this Act provisions from the *Fish Protection Act* respecting sensitive streams, bank-to-bank dams and fish population protection orders as well as provisions respecting the protection of streams;
- provides new powers to be applied when streams are at risk of falling or have fallen below their critical environmental flow thresholds to modify the existing precedence of water use for the purpose of protecting the aquatic ecosystem of streams and aquifers and essential domestic uses;
- renames water management plans as water sustainability plans and provides new regulatory powers that can be exercised on the recommendation of a water sustainability plan, including regulations restricting the authority of approving officers, restricting the use of land or resources, reducing water rights, imposing requirements in respect of works and providing for dedicated agricultural water that can only be used for prescribed land and purposes;
- authorizes an administrative monetary penalty scheme;
- authorizes regulations providing powers and duties of officials under this Act to officials under other enactments;
- repeals most of the *Water Act*, leaving only provisions related to water users' communities, and renames that Act as the *Water Users' Communities Act*;
- makes consequential amendments to other Acts.

APPENDIX B – Environmental flows in the Water Sustainability Act¹

Primary Mechanisms

Section 15: Decision-makers “Must Consider” environmental flows. Section 15 of the WSA requires decision-makers to consider the environmental flow needs of streams for new authorizations (including licences and short term use approvals) for surface water and non-domestic groundwater use that is hydraulically connected.

Section 16 & 17: Mitigation measures. Decision-makers may require licence holders to undertake mitigation measures if a proposed diversion or water use, or changes in and about a stream, is on a sensitive stream, or if it will likely have significant adverse impacts on water quality, quantity or aquatic ecosystems.

Sections 86-88: Temporary orders. The Minister or Cabinet may make a declaration of a **significant water shortage**; when this declaration is made, the comptroller may make a **critical environmental flow order** that takes precedence, once essential household needs are accounted for, over other water rights, regardless of seniority. The Minister may also issue a **fish population protection order** to allow for the restriction of water use regardless of precedence when low flows threaten the survival of a population of fish.

Additional Mechanisms

Section 43: Water objectives. The WSA creates new authority to set water objectives in regulation for the purposes of sustaining water quality, quantity, and aquatic ecosystems. Water objectives set out criteria for water quality and quantity that land and resource use decision-makers must consider when making their individual decisions. Local governments can also be required to consider water objectives in their planning processes.

Section 124: Area-based regulations. Cabinet or the Minister may make area-based regulations, which are location-specific regulations that designate specific areas and create unique thresholds and requirements for those places.

Section 128: Sensitive streams. This section enables government to develop a regulation that brings in the existing 15 designated sensitive streams, as well as the ability to designate additional streams and hydraulically connected aquifers. Any new authorizations on designated streams or hydraulically connected aquifers may have terms and conditions related to mitigation measures, use of water, and monitoring and reporting.

Related Planning & Administrative Processes:

Sections 64-85: Water sustainability plans. The Minister is able to request or designate an area for the purpose of developing a water sustainability plan in order to prevent or address conflicts between water users or between the needs of water users and environmental flow needs, or to address risks to water quality or aquatic ecosystem health. Cabinet can enact several different regulations to make these plans

¹ Adapted from: Brandes, O.M., Wilson, S., Curran, D. & R. Simms. 2015. *Awash with Opportunity: Ensuring the Sustainability of British Columbia’s New Water Law*. Victoria, B.C.: POLIS Project on Ecological Governance, online: poliswaterproject.org/awashwithopportunity

binding; for example, water sustainability plan regulations can reduce the amount of water that licensees may divert.

Section 127: The Cabinet may make regulations that prescribe methods for determining the environmental flow needs of streams.

Section 1: Beneficial Use. The WSA defines “beneficial use” as including using water as efficiently as practicable and in accordance with applicable regulations, and for the authorized water use purposes and times.

Sections 23 & 121: Adaptation and no compensation. There is a 30-year review process allowing Ministry staff to give notice and review and subsequently change licence terms and conditions. This works with section 121, which dictates that no compensation is payable to any losses or damages resulting from license changes under the Act. If water sustainability plans propose significant changes to licences, then the plans *are* required to set out a plan for compensation.

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