2009 BC Endangered Rivers list

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This year marks the 17th annual “most endangered rivers” release from the Outdoor Recreation Council of BC (ORCBC).

The preparation of this list is the most comprehensive initiative of its kind in Canada

And while this list focuses on specific river issues, I also believe it does much to inform the general public of the many kinds of threats our rivers face

Regarding the process used to determine this list, ORC solicited nominations from its 100,000 members, which represent a number of recreation and conservation groups across British Columbia (BC).

In addition, we also received nominations from the general public as well as resource managers from throughout the province

So the list represents the views of those who use and recreate on rivers - as well as those who manage them

A final analysis of nominations was then done by our panel which includes many of BC’s best known river conservationists

Over the years, the endangered rivers list has done much to profile key issues and has had a significant impact. The most recent example is the Upper Pitt River, which fell off the list this year for the right reasons after being in the number one position last year. The profile this issue received last spring as BC’s most endangered river played a key role in the government’s decision not to allow a major power line through a near-by park. This in effect at least temporarily stopped a very controversial power project proposal.

Similarly, the Capilano River fell off the list last year for the right reasons when the Greater Vancouver Regional District (GVRD) (also known as Metro Vancouver Regional District) agreed to develop a water use plan and modify the dam over time to address fisheries related concerns.

I might also add that this list is not meant to be all inclusive in that our first short-list included several dozen rivers. However, the river issues that made it on to the final list for 2009 are those that are deemed to be most urgent.

With that, I'll review this year's result;

## 1. Flathead River

As one of North America's most beautiful rivers flowing through both south-eastern BC and the state of Montana, the Flathead continues to face an array of threats - and, for the second time in the last 3 years, finds itself in the number one position. Foremost among the threats confronting this waterway is the proposed Cline open-pit coal mine (often referred to as the Lodgepole Mine), which would be located in the headwaters of the Flathead River about 50 km south of Fernie. If approved, the mine would produce about 2 million tons of bituminous coal per year.

The Flathead River runs through the largest, unsettled, low elevation valley in southern Canada and is one of North America's wildest and most beautiful waterways. No other region along the Canadian – United States border sustains such a diversity of wildlife and ecosystems.

The river and its surrounding terrain, which forms the western boundary of the Waterton – Glacier International Peace Park, supports many important wildlife populations ranging from grizzly bears to tailed frogs, both of which are blue-listed species. The Flathead also has some of the best water quality of any river in Canada (if not North America) and supports important trans-boundary fish populations that

include the blue-listed bull trout as well as westslope cutthroat trout. The river's floodplain is a critical travel corridor for wolves, grizzlies and elk. It's also important to note that the Flathead supports perhaps the highest density of inland grizzly bears in North America.

Yet, the BC portion of the Flathead River and its surrounding environs remain vulnerable and unprotected.

The proposed mine that would be developed by Cline Mine Corporation would have a lifespan of approximately 20 years and would be located on Foisey Creek, a tributary of the Flathead. To service the mine, up to 40 km of road would have to be developed.

While most British Columbians fully acknowledge that mining is an important and major industry in our province, there is also a belief that some places are not appropriate to mine, and the Flathead River is one of them. There are also widespread concerns that the impacts associated with the proposed mine will be difficult, if not impossible, to mitigate due to its size and location at the headwaters of one of North America's wildest river valleys.

Looking at nearby coal mines in other watersheds, high rates of selenium, nitrates and sulphates have often been found in wastewater run-off and many of the standard toxicity tests that have been conducted in streams capturing coal mine run-off have resulted in some significant fish kills. The Flathead should be spared from such a fate.

In addition, even many past proponents of mining appear to be questioning whether there's an actual need for this particular mine in light of the region's diverse economy combined with the Flathead's long history of recreational use.

Given that the Flathead is an international waterway, any adverse impacts associated with the proposed mine will also extend downstream close to Montana's Glacier National Park and then to Flathead Lake. The river's U.S. stretch has also been designated under the "Wild and Scenic River" system and it's estimated that, if a

pollution event were to occur, contaminated water could reach Montana's Flathead Lake within 48 hours of discharge from the mine.

At present, the terms of reference for the mine is being reviewed by the BC Environmental Assessment Office (EAO) which will ultimately gauge whether or not the risks associated with the mine can be mitigated. To date, public sentiment and feedback towards the mine has been overwhelmingly negative. A recent poll also showed more than 70% of local residents wanted to see the Flathead Valley protected from development.

And given that there are number of other active nearby coal mines in other watersheds, all of which have potential for expansion, it seems to make much more sense to consider expanding those rather than industrialize a new, undeveloped valley like the Flathead.

In addition, many believe that approval of the mine would be very difficult to justify from a scientific perspective in that there is not enough information to accurately determine the impacts of the project on the entire Flathead Basin.

Consequently, in light of this uncertainly, the ORC believes the EAO and the BC government should take a risk-averse approach - and, for the good of the river and its valley, block the mine. We believe this is the best and most sound approach. If the EAO considers other options, then Cline Mining Corporation at the very least should be required to conduct a thorough, basin-scale environmental assessment for the trans-boundary Flathead Valley, including 3-5 years of baseline data collection before the mine is further considered. Such an assessment we believe would reveal significant environmental costs attached to this proposal.

Many river advocates and conservationists were also dismayed last year to hear that the federal government, which was ceded the Dominion Coal Blocks in the upper Flathead under the Crow’s Nest Pass Act of 1897, has dropped their long standing requirement for a National Park Reserve feasibility study before transferring the land back to the province. Furthermore, many respondents felt it was

premature for the federal government to transfer the land in that federal jurisdiction as this would have help to ensure that the Canadian Environmental Assessment process would apply to this development as opposed to weaker provincial standards.

To make matters worse, many believe the approval of the mine would be a stepping stone to other coal-field development in the watershed.

Still other threats to the Flathead include the prospect of gold mining (Max Resources has already initiated exploratory drilling inside one of the valley's few "no coal staking reserves). In addition, BP Canada has expressed its intent to enter the Flathead to explore for coalbed methane which would carry with it the associated infrastructure of roads and pipelines. Among other issues, a new forestry road is being considered for the upper Flathead; a new BC mineral mine is being proposed for an area close to the border; and unchecked land development and uncontrolled motorized access remain issues of concern.

Finally, we believe the current Southern Rocky Mountain Land Use Plan doesn't adequately recognize the exquisite values of the Flathead River and should be revisited and modified so as to enhance the stewardship and protection of this incredible waterway.

## 2. Kettle River – (excessive water extraction, development, small scale hydro development)

The Kettle River is confronted by an array of threats ranging from development and excessive water withdrawal in its upper reaches to a controversial small scale hydro proposal in Cascade Canyon. Just as worrisome, the events unfolding on the Kettle may well foreshadow what other streams in the region might be confronted with in the face of ongoing climate change.

In the spring of 2007, despite an above average snow pack, the peak in freshet run-off was barely noticeable across the entire Kettle River system. In the view of many locals, this was a clear indication of

water extraction pressures and yet, new proposals continue to come forward. Among these are new withdrawal proposals for large scale condo developments, golf courses and ever expanding land development and settlement.

In the past three summers, the Kettle River has experienced record low flows (so low at times that local resident's couldn't even tube down parts of the river). This spring is shaping up in a similar way with current snow loads well below the seasonal average. Consequently, low summer flows are once again anticipated. Such low flows result in higher water temperatures, increased algal growth and the deterioration of habitat for fish and other aquatic organisms.

To further complicate matters, there is a proposed water use application from Big White that would extract 300 million gallons of clean water from the existing Kettle River supply (this would represent a more than 200% increase in their existing license). This is tied to eventual expansion plans for the ski hill, including new condo development and snow-making, and would entail the construction of upstream storage reservoirs. Under this expansion, the number of bed nights in Big White will double from 16,000 to about 32,000. The Ministry of Environment (MoE) has indicated their intent to approve Big White's new water license upon approval of their new Official Community Plan (OCP).

While the water captured by Big White would be only a small percentage of the total freshet, this will still, in all likelihood, mean less water will be available for existing downstream residential and agricultural users. Spring flows in the river's upper reaches play a crucial role in recharging the downstream aquifer. Yet, the government has downplayed the impact of additional extractions - but many who live within the watershed believe Ministry estimates of the percentage amount Big White will extract from freshet flows are artificially low and they question how and where these measurements were taken.

Because of this, local stakeholders, such as the village of Midway, have expressed concern about the ecological impacts of Big White's

extraction proposals. Among these concerns are impacts to the river associated with anticipated large volumes of urban effluent that would find its way into the Kettle.

In an effort to deal with these impacts, there is a need for the provincial government to establish a Watershed Management Plan for the Kettle River that would provide much needed context for any future water extraction proposals. This is essential in the view of many given the seemingly unbridled development now taking place within the upper watershed. It's also important to note that there are many authorized licenses that were not fully utilized during last year's period of record low flows and yet, their right to extract water remains in effect. On top of that, there appears to be an increasing number of unauthorized withdrawals.

In light of all this, the development of a management plan must recognize that there are clear ecological limits to water withdrawal from the Kettle River system.

Another area of concern centers on cattle grazing and an apparent relaxation in the requirements of range-use plans that is resulting in greater degradation of riparian zones and general water quality. These effects are most significant in dry land zones such as those in the Kettle watersheds.

Still another issue of concern, and a potential source of new pollution, stems from the plans of Boss Power to undertake the extensive exploratory drilling with the intent of mining uranium in the Beaverdell area. At present, it appears as if the company will proceed upon getting their development permit approved.

And finally, the river is also threatened by a planned independent power project on the Kettle River at Cascade Canyon (in the southern interior of BC about 20 km east of Grand Forks), a beautiful setting with significant recreational values.

The proposal, the Cascade Heritage Power Project, calls for the development of a 25 mega watt (MW) run-of-the-river dam on the Kettle

River, just above the Cascade Canyon, and about 20km east of Grand Forks. It involves the construction of a rubber weir above the canyon, and some 800 meters of tunnel to a powerhouse at the base of the canyon. During low water flows, the amount of water that will be allowed to flow through the canyon will be reduced to 4 cubic meters per second or less. The company's water license has already been approved.

An independent socioeconomic survey conducted by Yarnell and Associates (2001) determined that this power project "does not create significant long-term employment opportunities or other benefits for the community [and is] inconsistent with commitments to respect neighbors, local land-use plans and First Nations" and that "the project would compromise the aesthetic value of the falls and general area, which is essential to the community's economic and social well-being".

Aside from cultural and tourism concerns, the Kettle River is also home to at least three red-listed and five blue-listed species of fish. One of these species is the speckled dace (*Rhinichthys osculus) which is being considered for listing under the Species at Risk Act, and the bulk, if not all of the Canadian population, is found in the Kettle River watershed. The IPP proponent states that impacts to these species-at-risk will be minimal, but in the mind of many, any potential risk to species-at-risk and their habitat is unacceptable.*

The ORC believes that the Cascade Canyon should be preserved as a Goal 2 (Special Feature) provincial park as recommended by the Regional Protected Area Team for West Kootenay-Boundary through BC's Protected Area Strategy, and as an Inter-agency Management Committee was considering in the late 1990s.

## 3. Glacier/ Howser Creeks (near Kaslo, BC – threatened by IPP proposal**)**

A proposed independent power project (IPP) threatens these creeks which are located close to Kaslo. The proponent of the project, Purcell Green Power, received approval for the final terms of reference last year and the submission of the company's final proposal is eminent.

Among the possible impacts associated with this project are; the potential damage to blue-listed bull trout habitat; possible run-off and siltation from waste rock (from tunneling), impacts to the MacBeth Icefield Trail; potential impacts on blue-listed grizzly bears and wolverines; extensive clearing for a 91.5 km transmission line, 25 roads and seismic lines; and runoff from roads that would have to be built in precipitous terrain.

This issue has become the center of a major campaign in the Kootenays and many local respondents expressed concern about the approval process for IPP's along with the associated gold-rush mentality that has existed in recent years. Just as importantly, there is a lack of a broader regional (as well as provincial) strategy for such projects and such proposals have not been included in past land use planning processes.

In addition, many from this area, which lies in the heart of the Columbia Basin, still have memories of the last round of energy projects which displaced 2300 residents from their farms and homes, destroyed the prime wildlife habitat of the region, and inundated First Nation cultural sites.

The proposed Glacier/Howser Hydroelectric project is a $240 million 125 MW private project 100 km north of Nelson, B.C. They were awarded a B.C. Hydro contract in the 2006 "Call for Power" and have been participating in the Environmental Assessment Office review process. The area has outstanding recreational and ecological values and is part of long-standing park proposals by both the Western Canada Wilderness Committee, and the Valhalla Wilderness Society.

## 4. Fraser River

While the efforts of the Fraser Basin Council to promote sustainability throughout the basin are to be commended and we continue to see environmental gains in the practices some large riverside communities (such as Surrey and Burnaby), the Fraser continues to face an array of pressures and remains in the top 5 for the 16th time in 17 years.

Perhaps most alarmingly, Fraser sockeye returns in both 2007 and 2008 were the lowest in the last 30 years and many of its coho and Chinook are also in decline. While some of this is no doubt due to ocean conditions and marine survival, habitat issues remain a key concern as well.

While long standing issues such as sewage and pollution continue to be problematic, there are also a host of emerging issues that are the cause of much concern. Among these are periodic low flows in most of the last several years, unchecked agricultural impacts, reduced protection for many urban stream tributaries and a growing interest in establishing a water highway (which would include a series of ports and in all likelihood, extensive dredging to accommodate container barges) upriver to Hope.

In addition, the river continues to be threatened by impacts associated with rapid urbanization, urban run-off, new transportation corridors, extensive logging in its headwaters, widespread bank armouring, industrial pollution (especially along the north arm), gravel extraction and rapid development along its most productive stretch between Hope and Mission. There are a number of old contaminated sites that continue to be problematic.

Other areas of concern are the North and Middle Arms of the Fraser, along with the continued retrogression of the outer delta marshes, which provide important habitat to juvenile salmon as well as large numbers of waterfowl. This situation may further worsen in light of an

array of new development proposals near Iona Spit on the north arm, ranging from airport expansion to a new ferry terminal.

All of these issues have played a role in this year's listing and there are increasing concerns about the river's long term health and our commitment to sustainability. And while it's important to note that progress has been made on some fronts over the past decade thanks to the valiant efforts of many stewardship groups, a significant number of respondents expressed concern that some of the most pressing issues facing the Fraser are not being addressed to the extent they could be.

One of the most publicized events in recent years centers on the continued deterioration of salmon returns. In some years, large numbers of sockeye have also disappeared before they could return to their spawning grounds. In 2004 for example, while more than 2 million sockeye were expected to return to spawn, less than 500,000 actually made it, making this one of the poorest sockeye returns in decades. Similarly, in the fall of 2005, large numbers of sockeye disappeared while in both 2007 and 2008, actual sockeye returns were far below original projections and amongst the lowest in many years.

The causes of this, while not yet fully understood, may range from warmer water temperatures to excessive and/or unauthorized fishing. Whatever the reason, however, these occurrences indicate the need for a more cautious, risk averse approach to the management of the fishery until the causal factors behind these events are fully comprehended and acted upon to the greatest extent possible. On a positive note, the DFO has recently acted to limit or curtail fishing opportunities when the conservation of certain salmon stocks appeared to be at stake

There is also a clear need to allocate additional resources to the Department of Fisheries & Oceans (DFO) so that they can fulfill their management and enforcement obligations.

Another long-standing threat to the Fraser pertains to sewage pollution. While there are other examples elsewhere in the watershed,

many respondents expressed ongoing concern that the Iona treatment plant still provides only primary treatment. And while this plant's effluent is discharged into the Strait of Georgia as opposed to the mainstem of the river, many millions of young Fraser River salmon pass through the discharge area on their journey out to sea. At present, the upgrading of major sewage facilities to secondary treatment levels is not scheduled to be completed until 2030 at earliest, an excessive timeframe in the view of many.

Agricultural impacts along the Fraser and its tributaries throughout the Fraser Valley farmbelt also continue to be problematic. Along many of the river's smaller tributaries that run through agricultural settings, there is a lack of riparian protection while other issues relate to the inappropriate use of pesticides and fertilizers. Another significant issue in much of the valley centers on the inappropriate disposal of manure during winter months in close proximity to streams. This is pertinent in that the Fraser Valley has the greatest concentration of farm animals (ie. sheep, hogs, cows, turkeys and chickens) anywhere in Canada that generate a volume of untreated waste equivalent to what 800,000 people would produce in a year.

While the inappropriate disposal of this waste poses a problem for rivers and fish, there are also about the potential for human health implications.

In terms of mitigating agricultural issues, there must be increased efforts to enforce existing regulations and there's a need to continue recent efforts to develop a "best management practices" philosophy throughout the farming community. There is also need for a plan to better protect and restore streamside vegetation along many key tributaries throughout the Fraser Valley farmbelt. In addition, there must be even more vigilance in terms of protecting lands within the ALR, especially in light of continuing pressure to remove large parcels for development purposes.

On a positive note, despite the potential for conflict, agricultural land also presents a real opportunity to protect stream habitat and the ORC believes that farms and fish can co-exist side by side. In an effort to

achieve this, farmers are being encouraged to develop “environmental farm plans” (EFP’s) which could be very helpful in mitigating various environmental impacts. The ORC is fully supportive of this initiative.

There is also extensive concern about the need to better protect the Hope to Mission stretch of the Fraser, which is one of the most productive stretches of river in the world. This section sustains more than 30 species of fish (more than any other BC waterway), including all species of salmon as well as Canada’s largest population of sturgeon. In addition, more than 10 million pink salmon spawn in this part of the Fraser mainstem in peak years and millions of other fish migrate through this section.

Yet, while this area remains extremely productive in terms of fish habitat and is still largely in its natural state, there is currently no collaborative plan to protect key riparian areas along this part of the river.

In an effort to address this, the new “Heart of the Fraser” campaign was launched in 2006 with widespread support and it remains a beacon of hope along part of the river. A key part of this innovative initiative deals with the acquisition of key private lands for conservation purposes. This is being spearheaded largely by the private and non-government sectors (including groups such as the British Columbia Institute of Technology (BCIT), the Nature Trust, the North Growth Foundation, and the Pacific Fisheries Resource Conservation Council (PFRCC).

However, there is also an urgent need for a collaborative vision for the Heart of the Fraser that will identify key environmental and cultural values and hopefully be developed and led by lower Fraser First Nations, in consultation with groups such as the Fraser Basin Council and BCIT’s new River’s Institute. In recent months, there have been some fruitful initial discussions in this regard which could yield positive results in the coming years. A hopeful off-shoot of this will be renewed efforts to better manage and protect key crown lands.

The “Heart of the Fraser” project is one of the most exciting conservation initiatives in Canada and some major headway has already been made with the purchase and protection of much of the Harrison Knob (which in turn has been turned over by the Nature Trust to the Skowlitz First Nation to manage in perpetuity). The recent acquisition and protection of the Tom Berry Ranch property near Hope in the fall of 2007 was also good news for the river.

And finally, there’s a need for a more integrated approach to reducing the flood risk along parts of the lower Fraser. There are concerns amongst river stewards and scientists that some gravel extraction proposals have been excessive in size for single locations. In addition, when gravel is extracted from various islands and bars, efforts must be made to avoid pink salmon spawning years so as to avoid massive fish mortalities (such as what occurred at the Big Bar site in March of 2006). Furthermore, many believe there is a need for more science-based decisions when choosing amongst gravel extraction options. Last but not least, highly productive side channel fisheries habitats that are more sheltered from flows (and hence less likely to heal quickly from gravel extractions) should be protected from such activities.

A recent report from the PFRCC called for multi-sectorial task force that would strive to integrate both environmental and flood-related concerns. Such a task force could also potentially take some initial steps toward the development of a collaborative plan for this part of the river. The Minister of Environment, Barry Penner, recently indicated that he would consider this recommendation and, if such a committee is struck, that will create an opportunity for progress on this front.

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In closing, “the Fraser is the heart and soul of our province and the world’s greatest salmon river” said Mark Angelo, ORC Rivers Chair. “Yet, the river continues to face an array of threats and there are still too many instances where land-use and resource management decisions are made at the expense of this great waterway. There is also a need for some additional policy and regulatory changes that will more vigorously address the most pressing issues facing the Fraser.”

“From a habitat protection perspective, there is also strong support for the development of an extensive and collaborative plan for the Fraser River lowlands” said Angelo. “This corridor extends from Hope to Mission and such a plan would focus on the proper management and care of key riparian lands. This particular part of the river is a jewel in Vancouver’s own backyard and such a plan would be helpful in sustaining the exceptional fish and wildlife values that exist along one of the world’s most productive river sections”.

## 5. Brohm Creek

Brohm Creek is a beautiful small sized waterway that is located just outside of Brackendale and is part of the Cheakamus-Squamish River system. Amongst steelhead streams, it is considered to be one of BC’s crown jewels and, in terms of densities of fish, Brohm Creek supports three to five times more steelhead than do most other south-coast rivers.

A major reason for Brohm’s productivity relates to the stream’s chemistry in that it has just the right amount of phosphorous that comes from the weathering of volcanic rock. This, in turn, bumps up algae levels which sustain large numbers of aquatic insects providing ample food for young fish.

Consequently, Brohm Creek represents a rare bright spot amongst steelhead streams given that the steelhead, BC’s most prized freshwater sports fish, is officially listed as a species of significant conservation concern across much of the southern part of the province.

Yet, in spite of its significance, Brohm Creek is potentially threatened by the massive “Garibaldi at Squamish” all season resort, a development that includes ski hills, golf courses and more than 20,000 bed units. An issue of particular concern centers around water extraction and the extent to which the resort will rely on Brohm Creek flows. There is particular concern that this development could result

in less flows and, for a good part of the year, there is simply no surplus water to be had from the Brohm Creek system.

In response, the proponent has stated its intent to divert and hold back water during the freshet believing there are adequate flows to support the development at that time of year. However, steelhead smolts migrate out of the creek during high flows while freshet conditions also help adult fish to migrate into the system. The extent to which they would be impacted by reduced flows remains unclear.

In light of the extensive water needs of this all season resort (i.e. for potable water, irrigation, snowmaking, etc.); it's important to know up front the answer to a number of key questions. For example; how much water will be needed? Where will it come from? And most importantly, how much will be left for fish? In response to the concerns, one alternative currently being explored by the resort proponents is the possible use of Cheakamus River groundwater during summer months, if in fact this water is available.

Still another issue to be resolved centers around the size of riparian or streamside buffers that will be protected. Without a significant buffer, the creek will, in all likelihood, be adversely impacted. Sewage disposal is also cause for concern. The proponent has not yet committed to the extent of treatment that will be provided. Current plans call for sewage to be discharged into the nearby Cheekeye River and there are concerns that the stream's chemistry could be adversely impacted. The construction of the resort's two large golf courses will also take place in close proximity to the creek and, unless the use of nitrogen based fertilizers is minimized, there's concern that runoff from the courses could adversely alter the chemistry of Brohm Creek, which is the key to it productivity.

In light of these many concerns, there is a need for all of these issues to be addressed to the satisfaction of all stakeholders before this resort is even considered for approval and every possible step must be taken by the developer, in consultation with river stewards, to ensure that Brohm Creek and the steelhead it sustains, are adequately protected.

## 6. Peace River

The Peace River is once again threatened by the possibility of a third hydroelectric dam project known as “Site C” (although the consultation and assessment process looking at the feasibility of this project is still in its preliminary stages). If the dam is eventually built, it would create a smaller reservoir than the other existing dams on the Peace - and Site C is often referred to as a large-scale, run of river type project. Yet, it would still flood more than 80 kilometers of the last largely natural stretch of the Peace River in BC. It would also eliminate roughly half of the available fast-flowing sections that currently exist within the BC reach.

Also, while some refer to the fact that the Peace is already dammed as a way of justifying the project, it’s important to note that dam-related impacts tend to be cumulative in nature.

In terms of how this project will be assessed, ORC is a strong advocate of full-cost accounting and is very supportive of the need for an extensive public consultation process that allows ample debate while ensuring that environmental and social costs are fully weighed against perceived benefits.

And while formal approval of this project is still years away, the fact that the Peace already appears on this list is a reflection of the concern that many local residents, conservationists and First Nations have. Furthermore, in March of 2007, the BC Treaty 8 Tribal Association passed a motion in strong opposition to the Site C proposal.

From an environmental perspective, many believe that the addition of this dam would compound problems for the already severely threatened river and all of those who rely upon it. Since the project

site is located in the headwater area of the Mackenzie River watershed, all downstream waterways would be affected. For example, unacceptable levels of methyl mercury produced by the existing reservoirs are already found in fish of the Peace/Athabasca delta (Timoney et. al., 2007.)

If Site C goes ahead, it will add to the energy production of the other dams on the Peace River while also providing an unpublicized seasonal amount of energy to the Northwestern United States.

However, the Site C project will also come with a 6 Billion dollar price tag, and it will impact the Mackenzie watershed environment for centuries to come. In this regard, there are a myriad of specific concerns that have been expressed by both British Columbians and Albertans.

Among the many key points mentioned by respondents are as follows;

- Large dams are often the cause of mercury contamination. Bull trout in Williston Lake (the upstream reservoir created by the WAC Bennett dam) have levels of mercury close to 0.6 ppm, which is higher than the Canadian standard for human consumption (0.5 ppm). While the existing dams have certainly been a causal factor, the incremental effect of Site C remains unclear at this point.
- The Peace River valley is home to the only class 1 agricultural land in BC north of Quesnel. If Site C is built, a significant portion of this valuable land will be lost.
- Large numbers of rainbow, Dolly Varden, whitefish and grayling are found in this section of the Peace. Numerous birds are also found here (including large numbers of migrating geese and swans) while deer, elk and moose roam the river's banks. There have yet to be adequate studies on how these populations would be impacted.
- The Peace/Athabasca Delta has suffered a surprising amount from the two already existing upstream dams on the Peace. The unnatural control of water flow (loss of seasonal fluctuation), and mercury contamination are among the major problems affecting the delta and may be further exacerbated by the construction of another dam.

- Much of the area that would be flooded includes traditional First Nations lands and archeological finds to date have documented First Nations use of this area dating back at least 10,500 years ago. In addition, under the 1899 Treaty 8, First Nations were promised that their traditional way of life in this area would be preserved and protected.
- Many of the people who live in the valley are descendants of the first pioneers to settle here. The flooding of the valley may result in some families being forced to relocate. For others, access to their ranches would have to be re-engineered.
- The land that would be lost is important wildlife habitat and the warmer sub-climate in the valley provides important refuge for many animals during the cold, winter months. Moose, for example, are rarely seen in the valley during summer, but as soon as heavy snows and colder temperatures hit, they become a common sight. Vast areas of willow flats would also be inundated, removing much of their food supply.
- The flood zone area forms an irreplaceable part of the 'Yellowstone 2 Yukon' corridor. If this part of the valley is flooded, it will largely sever this corridor, which is extremely important as a migration corridor to many animals.
- If the valley were flooded, many valuable heritage sites, both aboriginal and paleontological, would be destroyed. A report completed for BC Hydro (The Site C Heritage Resource and Inventory Assessment), states that the significance of this cannot be overstressed. It says that the Peace River valley provides a unique window into 10,000 years of history, all of which would be lost.
- The scenic Peace River is currently used by many recreational boaters, canoeists, and campers. Yet, the Site C "Report and Recommendations to the Lieutenant-Governor-in Council" by the British Columbia Utilities Commission says that "The commission concludes that the creation of the reservoir will provide recreational opportunities of a significantly lower quality than the ones that will be lost". As an example, Williston Lake has proven to be of little value even for transportation and, because of driftwood and deadheads, it remains dangerous to this time. In addition, a primary loss too many recreationists would be to truncate the first 80 kilometers from the Hudson's Hope to Fort Vermillion canoe route.

- Silt is collected in the reservoirs created by dams, which leaves the river downstream depleted of nutrients. The construction of Site C may further worsen this situation.

## 7. Coquitlam River

The Coquitlam has unfortunately appeared on this list many times - and the major issue continues to revolve around excessive sediment loads most of which is caused by gravel mining.

On a positive note, there has been some progress in recent years such as the creation of some significant new off channel habitat. The ORC is also encouraged that the feasibility of sockeye re-introduction is being examined. In addition, praise should go to BC Hydro for moving ahead with the Water Use Planning process and Coquitlam's River Aggregate Committee has also done some excellent work.

However, there continues to be major problems with silt and sediment loads from nearby gravel mines and, for much of the winter, silt levels continue to exceed those deemed damaging to fish. As a result, there continues to be a need for a thorough review of current gravel operations and the strict enforcement of existing environmental legislation.

And while some significant funds have been spent by local gravel firms in an effort to control silt, there is a clear need to do much more. One need only drive above the gravel mines on a rainy day to see the difference in water quality there as opposed what exists downstream of the mines. And for many days of the year, particularly during the rainy months of winter, siltation levels along much of the river are considered to be at levels deemed harmful to fish.

On an encouraging note however, the local, multi-stakeholder aggregate committee is now considering a long standing proposal to divert water that enters the mine sites from surrounding terrain. If this

were done and this water were diverted around the mines, that would substantially lessen the amount of water that accumulates and becomes silt-laden within the gravel pit area. Under such a scenario, the reduced amount of water would then, in all likelihood, make the additional engineering solutions to control run-off from the mines more viable.

If silt-related and other issues that plague the Coquitlam are to be fully resolved, the GVRD, BC Hydro, the Province, local government and the DFO must all decide to act in unison for the good of the river. As part of this, they must develop an appropriate strategy for the river corridor below the dam and demand that the silt and sediment issue associated with the gravel mines be fully addressed.

Other problems in the watershed include rapid urbanization and urban runoff. The advent of additional bridges coming on line (the David/ Pathan Bridge was recently completed) combined with an estimated 20 to 30,000 new residents moving onto the lower slopes of Burke Mountain, will place added pressure on the river system. Consequently, every step possible must be taken to protect the integrity of the river in the face of such development.

There is some hope, however, that the significant interest in the river that is being shown by some members of City Council as well as a plethora of individuals and citizen groups will be helpful in turning things around for this wonderful local waterway.

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## 8. Bute Inlet Rivers and Streams

A number of rivers and streams would be impacted by the 3.5 billion dollar Bute Inlet Hydroelectric project, a development which consists of 17 dams/diversions in the headwaters of Bute Inlet, located about 150-200 km north of Powell River, BC. Combined, these facilities have a potential production capacity of 1027 MW.

Once built, the project could produce enough energy to meet the electricity needs of 300,000 homes. However, there are major concerns about the project stemming, in large part, from its massive size which goes well beyond what most people originally envisioned as a green project. The proposal is 100 times larger than the current average run of the river project and involves a record 17 stream diversions, 445 km of transmission lines, 314 km of road and 16 power stations. As part of the proposal, generating facilities would be developed on a number of waterways within the Homathco, Southgate and Orford River systems.

The huge scale of this proposal, in an area that sustains large numbers of grizzly bears along with mountain goats, marbled murrelets and all species of salmon (as well as steelhead and bull trout) has created substantial concern about potential environmental impact - and the current proposal represents a massive reconfiguration of aquatic and terrestrial ecosystems.

This project is now in the early stages of the BC environmental assessment process, which will ultimately make recommendations that may, or may not, affect the project's viability. The unprecedented scale of the project has also raised serious concerns about the potential for cumulative impacts and, when viewed in combination with a number of other IPP's being proposed for nearby inlets, this could be a major step toward the industrialization of much of the mid coast.

There have also been a number of comments from academics and others relating to the deficiencies of the terms of reference for the project that have been submitted through the environmental assessment process. Concerns expressed range a lack of information regarding the preliminary assessments that have already been undertaken by the company to an inadequate focus on climate change scenarios and the shrinkage of glaciers that will ultimately impact the area's hydrology.

## 9. Coldwater River (and other Thompson River Plateau streams).

While the drought conditions that helped propel the Coldwater closer to the top of this list in recent years have eased somewhat, the outlook for the Coldwater remains troubling and record low summer flows seem to becoming the norm.

In addition, the low flow period is becoming prolonged by an earlier onset, in all likelihood a result of climate change. This has also resulted in increased summer water temperatures which continue to remain near lethal limits for fish. Given that the current snowpack is below average, there may again be flow related problems this coming summer.

Due to concerns in past years that centered on excessive water extraction and the adverse impacts this is having on fish stocks, the Nicola and Coldwater Rivers have been widely viewed as endangered. Other nearby streams that have flow-related issues associated with existing or proposed water extractions includes streams such as the Bonaparte, Deadman and the Juliet.

Rivers such as the Coldwater and Nicola are key tributaries of the renowned Thompson River system and yet, in recent summers, much of their flow has been diverted and removed. Furthermore, there are already enough water licenses in place to potentially dewater lower parts of the Coldwater while other tributaries, such as Spius Creek, are also being significantly affected by excessive water extraction.

As a result, fish stocks have been increasingly stressed and, in August of 2004, 05 and 06, in the midst of dry hot conditions, stream temperatures soared to lethal limits. The release of some stored water from Nicola Lake was all that kept the river's salmon runs alive and, as the river's tributaries warmed and withered, juvenile fish were forced to crowd into what little habitat remained.

It must also be noted that steelhead numbers in the entire Thompson system have dwindled significantly. These fish are clearly threatened and about 60% of this world-renowned stock originates from the Nicola system. This past year, for the first time, also saw the closure of the Thompson River steelhead fishery.

Consequently, there is an urgent need for a watershed-specific steelhead recovery plan developed in consultation with all stakeholders. The development of such a plan has been spearheaded by groups such as the BC Wildlife Federation and the BC Federation of Driftfishers, which is certainly viewed as a positive development. To succeed, such a plan will require adequate flows among other habitat improvements. In addition to widespread concerns about steelhead, southern interior coho (many of which return to the Nicola to spawn) are also officially viewed as a species at risk.

In recent years, water use in the Nicola drainage has been relentless, an issue recently highlighted in a special report by the Pacific Fisheries Resource Conservation Council. Based on its own observations, the Outdoor Recreation Council has also concluded that, while some ranch operators have proven to be good stewards and conservers of water, others clearly have not. This past summer, during the hottest dry spell of late August (and after the most profitable crops were cut), there were still many documented incidents of sprinklers running 24/7. Much of this water was clearly being lost to evaporation. Consequently, there's a pressing need to look at more efficient drip irrigation systems and regimes.

But on a more positive note, the BC government has recently consolidated the management of water in the province through the creation of the Water Stewardship Division within the Ministry of Environment. This will be helpful in trying to resolve water use issues in areas such as the Nicola River drainage.

In spite of far reaching concerns about the maintenance of adequate flows for the watershed, requests for new water withdrawals in this area are still being considered by the province. Licenses for thousands

of acre feet of water stored in Nicola Lake are on the pending approval list. There is also a proposal for a large, all season resort development near Juliet Creek in the headwaters of the Coldwater drainage while additional proposals for a resort, subdivision and a golf course near the site of the Merritt Mountain Music Festival would exert additional pressure on local water resources.

Consequently, any water management plan for this area must respond to a number of key questions; where will the new licensed water come from? Who will monitor its careful use? What will be left for the river, particularly in light of the increasing frequency of hot, drought like conditions?

There is some reason for encouragement in that some of these questions are beginning to be addressed - but until there are clear answers, ORC believes that extreme caution should be exercised on the issuance of new water licenses for the Nicola system as well as transfers of currently unused licenses, unless these are used for conservation purposes. There is also some potential for the increasing use of partial term or seasonal licenses where appropriate if they can be justified based on present (as opposed to historical) flow records and if there is adequate compliance with agreed upon cut-off dates.

In summary, the placement of the Coldwater River, which embodies many of the issues facing the Thompson River drainage, on this list continues to reflect the broader need to better manage BC's water resources. In future, we must strike an appropriate balance between allocating water for development while also ensuring we protect the needs of fish and other aquatic life.

## 10. Klinaklini River

A run-of-river hydroelectric development of unparalleled scale has been proposed for the Klinaklini River. The exceptional ecological value of the Klinaklini River lies in it's remoteness from industrial impacts and the unique abundance of nutrients carried through the Coast Mountains from it's headwaters in the Chilcotin Plateau. The

river, which eventually flows into Knight Inlet, sustains some of the strongest salmon and steelhead runs of the west coast, one of the last stable eulachon runs and a healthy grizzly bear population.

The (700 MW) run-of-the-river hydro development proposal for the Klinaklini River is now in the Environmental Assessment process. The project would divert most of the natural river flow by going around (by-passing) a major pristine canyon. While there are concerns about how this project will directly impact both fisheries and wildlife values, many also believe an undeclared threat would be the later firming of power production and thus profitability by damming the river upstream and thereby flooding a large pristine protected area (The Upper Klinaklini Conservancy).

The transmission line for the project would cross the very sensitive estuary of the Klinaklini, which is an important Conservancy in itself, and would then cross highly sensitive visual management areas en-route to Vancouver Island.

Once approved, this project, including future damming to create an upstream storage reservoir would be difficult to stop due to the investment involved. While salmon cannot ascend beyond the canyon, they would, in all likelihood, be impacted by flow and temperature changes if an upstream reservoir was created.

## 11. Somass River

The possibility of severe summer drought is once again facing many east coast Vancouver Island streams in 2009. Present snow survey data from much of the Island remain at only around 60% of normal snowpack levels, invoking the possibility of widespread summer drought. These conditions are similar to those most recently experienced in 2006, when an extended drought persisted to early November.

Such droughts can lead to losses in egg viability and also adversely impact the health of adult fish before spawning can successfully take place. Excessively warm water accompanying droughts increases the virulence of fish diseases, parasites and fungal infections, leading to significant pre-spawning losses.

This has been especially true for July migrating sockeye, such as those returning to the Somass watershed in Port Alberni. There have been five significant "warm water" events over the last 15 years affecting this highly prized stock which supports important First Nation, sport and commercial fisheries in Alberni Inlet and Barkley Sound. In 2008, all fisheries were closed for conservation purposes, in part because the 2003 spawning escapement was affected by warm river water with resulting poor recruitment success. This was compounded by low ocean survival of the 2003 brood smolts, leading to very weak adult returns last summer. Economic consequences were felt across the entire Alberni Valley community as this fishery has become a cornerstone of local commerce in the June to August period.

In an attempt to address the "cause and effect" of warm water outflows from the system's two large lakes (Great Central and Sproat), a Somass Basin Water Management Plan was launched in late September 2007. A primary objective is to examine local weather, hydrological and limnological factors triggering the warm water events, and risks to native fish populations. This is being done through innovative computer modeling and could lead to the identification of engineering options for "cooling" the salmon migration corridor in future.

The planning process includes innovative computer simulations of water temperature and flow relationships below the two large lakes that are vital to over-summering sockeye (i.e., provide cold water refuge at depth). Modeling is expected to reveal whether cooler water released from the lakes will provide a thermally secure corridor for sockeye during the peak of their upstream migration in late June and July. All sectors and interests are now engaged in the Plan's decision-making Forum which should ensure broad support for any

recommendations. This undertaking is seen by many as a possible ray of hope.

Other Vancouver Island Drought-Prone Watersheds

There are many watersheds in the Georgia Basin where seasonal stream flow limitations currently impact water security for both fish and people. Most of these are without supporting lakes and reservoirs capable of augmenting flows in periods of drought and includes streams such as the Chemainus, English man, French Creek, Tsable and Trent.

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## 12. Elk River

Located in the southeast corner of the province, the Elk sustains a thriving population of genetically pure west slope cutthroat trout and has been designated by the Province as “classified waters” in an effort to protect this unique fishery. The Elk River corridor and basin also serves as a vitally important wildlife migration corridor and is a vital part of the Yellowstone to Yukon initiative, helping to connect Banff National Park to the north and the nearby Flathead River Valley and Waterton-Glacier Parks.

Yet, despite its amazing natural values, there are ample reasons for concern about the river’s future. The human footprint adjacent to the river continues to rapidly grow. Most notably, there are 5 large strip coal mines and plans for another three. This is thought to be the major reason for increasing levels of selenium now found in the river and recent studies indicate these levels may be getting close to a tipping point. If levels become too high, that would have a significant adverse affect on local fish stocks.

In addition, other existing (or proposed) developments are adding to the cumulative impacts affecting the river. Among these are various

coalbed methane pilot projects, forestry activities, resort development (ski and golf), and highway related impacts (i.e. Hwy 3 and 43).

While coal mining and other developments in the Elk River watershed will no doubt continue, there are still a number of steps that can, and should, be taken in an effort to better protect fisheries and wildlife values.

In terms of what's needed, an independent scientific analysis should be undertaken to establish key baseline data that could be used to assess cumulative impacts associated with planned new developments. Selenium levels in particular must be monitored and tracked regularly. There must also be enhanced efforts on all industrial operations to follow "best management practices". In addition, a planning process for the area should be initiated with all stakeholders that would strive to establish a wildlife management area/corridor on the relatively undisturbed west side of the river so that critically important wildlife migration routes can be retained.

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- Rivers to watch in the year ahead;

The Skeena (impacts of fish farms, the need for a more selective fishery) ; The Ryan River in the Pemberton Valley (power project proposal); The Salmon River in Langley (falling water tables)

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In closing, according to Mark Angelo, Rivers Chair of the ORC, "the problems outlined in this year's list are extensive and diverse, ranging from concerns about industrial run-off to the impacts of low summer flows - and from controversial dam proposals to much needed efforts to restore damaged habitats. Furthermore, these issues highlight the fact that you cannot separate the health of our fish stocks from the health of our rivers; they are completely inter-dependent. And within any given watershed, if river habitat is destroyed or significantly damaged, you lose any chance you may have to protect or rebuild fish

stocks. Yet, while the waterways on this year's list face many habitat-related problems, things can still be turned around if there is a strong enough will to do so".

On a more positive note, the province increased the support in recent years for its "Living Rivers Program" to a total of 21 million dollars. While this was a positive step, additional funds will be required to turn things around. Consequently, we're hoping that the BC government will consider allocating significant additional funding (perhaps as a river legacy fund).

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