

2010 BC Endangered Rivers list
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This year marks the 18th annual “most endangered rivers” release from the Outdoor Recreation Council (ORC).

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 B.C.

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 several well known BC river conservationists.

Over the years, the endangered rivers list has done much to profile key issues and has often had a significant and positive impact.

The most recent example is the provincial government’s decision, as stated in this year’s throne speech, to ban mining and oil and gas development along the Flathead River, which topped the endangered rivers list last year. This news was greeted very positively by river conservationists and the province is to be commended (although such protection for the Flathead has yet to be formalized in perpetuity).

Similarly, the Upper Pitt River fell off the list in 2009 for the right reasons after being in the number one position previously. The profile this issue received as BC's most endangered river in 2008 played a key role in the government's decision not to allow a major power line through a near-by park which at least temporarily killed a very controversial power project proposal.

In a similar vein, the Capilano River fell off the list last year for the right reasons when the GVRD (now Metro Vancouver) agreed to develop a water use plan, as well as to net and safely transport out-migrating smolts to reduce the number killed as a result of swimming over the dam. Additional changes to the dam will be made in future to address other 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 2010 are those that are deemed to be most urgent.

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

1. (tied) - Kettle River – (excessive water extraction, development)

The Kettle River is confronted by an array of threats, the most noteworthy centering around excessive water withdrawal. 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. The fact that the Kettle is so prominent of this year's list also, once again, highlights the importance of updating the provincial Water Act so that the needs of fish are adequately considered when making decisions around water extraction.

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 have continued 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 locals 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 over 400 million gallons of clean water from the existing Kettle River supply (this would represent a 213% 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 increase from 16,000 to somewhere between 32,000 and 47,000. The Ministry of Environment has indicated their intent to approve Big White's new water license upon approval of their new Resort Master Plan Agreement.

While the water captured by Big White would be only a small percentage of the total freshet, this will, 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.

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.

On a positive note, the province is now soliciting public input on Water Act reform. Based on recent public statements, reformed legislation will strive to better protect stream health and aquatic environments, improve water allocation and regulate groundwater use. These changes, if adopted, would represent significant progress - so river conservationists will be watching closely as new legislation is developed and introduced over the coming year.

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 a proposal by Boss Power to undertake the extensive exploratory drilling with the intent of mining uranium in the Beaverdell area. While uranium mining is currently not allowed in BC by Order in

Council, this is being challenged and the company still hopes to proceed upon getting a 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 MW run-of-the-river dam on the Kettle River, just above the Cascade Canyon. 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 surrounding 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, which is listed 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.

#1 (tied) – “Sacred headwaters” of the Skeena, Stikine and Nass (threatened by coal bed methane development)

In a rugged knot of mountains, in the remote reaches of northern British Columbia, lies a stunningly beautiful valley known to the local First Nations as the “Sacred Headwaters”. Located on the southern edge of the Spatsizi Wilderness – the Serengeti of Canada – are the headwaters of three of Canada's most important salmon rivers: the Skeena, Stikine, and Nass.

Contrary to the wishes of first nations, the B.C. government has stated its intention to open the Sacred Headwaters to industrial development. The most ominous project is a proposal by Shell Canada to extract coal-bed methane gas from the area's anthracite deposit, across an enormous tenure of close to 400,000 hectares. Should this project go ahead, it would imply a network of several thousand wells, linked by roads and pipelines, laid across the landscape of much of the Sacred Headwaters basin.

Because CBM development requires a higher density of wells than conventional gas development, it causes serious impacts on wilderness landscapes. The maze of linear roads and pipelines required will fragment wildlife habitat and inhibit animal movement patterns. There are also disturbance concerns related to industrial machinery, noise from compressors (used to move the gas through pipelines), dust, and gas flaring.

However, the most serious impacts of coalbed methane extraction relate to water. CBM wells often produce vast quantities of “product water” from deep underground that contains high levels of salt and heavy metals. In other parts of North America, disposal of this wastewater has caused serious environmental damage. Although the BC government has said it will require companies to re-inject this waste-water underground, this procedure is largely unproven and carries significant risks, including the potential contamination of

aquifers. Given the link between groundwater and surface flows, this could have a dramatic impact on the biological richness of the three great salmon rivers that flow nearby. Wild salmon currently spawn within a stone's throw of Shell's proposed drilling sites.

It's not by accident that, to date, no major coal bed methane project has co-existed with healthy salmon populations. Consequently, the Iskut elders, almost all of whom grew up on the land, have formally called for the end of all industrial activity in the valley and the creation of a Sacred Headwaters Tribal Heritage Area.

On many occasions, starting in the summer of 2005, Iskut men, women and children, together with Tahltan supporters from Telegraph Creek and beyond, have maintained an educational camp at the head of the only road access to the Sacred Headwaters. They have also widely shared an alternative vision of a new era of sustainable stewardship, both for their homeland and the entire northwest quadrant of the province. After more than four years on the line, they are not about to give up.

While a temporary moratorium on coalbed methane development was hailed by conservationists last year, this is unfortunately slated to end in December of this year. Consequently, there is a pressing need for government to address this issue – and “there is widespread support for making this moratorium permanent, which would do much to protect the legacy of the great wild rivers that flow from this area”.

What's unfolding in the Sacred Headwaters also highlights the need for governments to be more proactive in protecting productive northern rivers. This is particularly important given that BC's more southerly salmon rivers are under increasing pressure from impacts relating to climate-change.

In addition, there are also serious concerns about Imperial Metals Todagin Mountain copper-gold mine project (i.e. Red Chris mine) that will see up to 30,000 tons of rock blasted each day, all within reach of the headwaters of the Iskut, a main tributary of the Stikine. And while the Supreme Court recently ruled that the federal government undermined its own environmental review process when assessing

this project, allowing the proponent to avoid a community consultation, work on the mine is proceeding full steam ahead. Plans for the mine also propose to use Black Lake as a tailing pond, raising additional fears that leechate will jeopardize nearby waterways.

3. 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 eased somewhat in 2008, they returned with a vengeance last year and, in late July, flows surpassed the all-time low for an extended period. The extremely low flows resulted in highly stressed fish stocks and resulted in at least one major fish kill over several kilometers that impacted juvenile steelhead, coho, Chinook, whitefish and rainbow trout.

In the view of many, the outlook for the Coldwater remains troubling and record low summer flows seem to be 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 over several 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 include 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, '06, '07 and '09, 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. Last year, for the first time, we 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 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.

To its credit, this past summer, the provincial government passed an Order in Council, under section 9 of the Fish Protection Act, to cease irrigation withdrawals on the Nicola River just as flows were reaching a severe low. This was an unprecedented action that likely saved significant numbers of fish. While there was opposition at first, there was also great co-operation from groups such as the Upper Nicola First Nation and the Douglas Valley Ranch. They gave up hard-won

storage in an effort to conserve water and recover flows and they're to be commended as is government for the actions they took on this issue.

The situation on the Coldwater however remains grave. There has only been mixed success in voluntary water conservation. There are also increasing concerns about excessive groundwater extraction and the increasingly apparent interaction between groundwater and surface water in the lower Coldwater. This once again highlights the need for groundwater legislation in BC, the only province in Canada not to have it.

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. In the past few summers, during the hottest dry spells 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 continues to be a pressing need for more to adopt efficient drip irrigation systems and regimes.

On a more positive note, the BC government, two years ago, did consolidate the management of water in the province through the creation of the Water Stewardship Division within the Ministry of Environment. This proved to be helpful in the summer of 2009 when 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 remain 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.

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 of 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 17th time in 18 years.

Perhaps most alarmingly, Fraser sockeye returns in 2009 were the lowest in 52 years. In addition, many Fraser coho and chinook stocks 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 cause for concern. Among these are periodic low flows in most of the last several years, reduced protection for many urban stream tributaries, a number of agricultural-related impacts 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), sewage, 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 seem to have disappeared before they could return to their spawning grounds. This was the case in both 2004 and

'05, while in both 2007 and 2008, actual sockeye returns were well below original projections and amongst the lowest in many years. 2009 was particularly dismal with only 1.4 million sockeye returning while as many as 10 million fish had been expected.

The cause of these low returns is not yet fully understood. But whatever the reason, 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. There is also a need to undertake more marine-related research than is currently the case. On a positive note, the DFO did act quickly 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 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 main-stem of the river, many millions of young Fraser River salmon pass through the discharge area on their journey out to sea. And in addition to traditional contaminants that are discharged (such as Copper and Zinc), there are also increasing concerns around "emerging contaminants" that are not filtered out, or contained, by current sewage treatment practices.

At present, the upgrading of the Iona sewage facility to secondary treatment levels is not scheduled to be completed until 2030, although Metro Vancouver has recently indicated this timeframe may be significantly lessened.

Agricultural impacts along the Fraser and its tributaries throughout the Fraser Valley farm-belt 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 is also potential for human health implications.

In terms of mitigating agricultural issues, there should be enhanced efforts to enforce existing regulations. However, it's also important to continue recent efforts to develop a "best management practices" philosophy throughout the farming community. In addition, there is a need for a plan to better protect and restore streamside vegetation along many small (but often key) tributaries throughout the Fraser Valley farm-belt. In addition, there must be greater 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, up to 20 million pink salmon spawn in this part of the Fraser main-stem 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 “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 BCIT, the Nature Trust, the North Growth Foundation, and the Pacific Fisheries Resource Conservation Council or 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 as was the recent protection of the McGillivray Slough in 2009 as part of the Bert Brink Wildlife Management Area.

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 prevent 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.

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. Peace River

The Peace River is once again threatened by the possibility of a third hydroelectric dam project known as “Site C”. 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.

After a series of consultations, it looks like the project will now enter the environmental assessment stage which will also include formal planning and evaluation of the project.

And while final approval of this project is still a few 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. Such widespread opposition from First Nations is a key concern.

From an environmental perspective, many believe that the addition of this dam would compound problems for the already severely impacted 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 to 8 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 (0.5ppm). 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 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 much more common. 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 so 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 done for BC Hydro (ie. 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 significant loss to 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 the two existing dams, which leaves the river downstream depleted of nutrients. The construction of Site C may further worsen this situation.

6. Similkameen River

In the southern Okanagan, a high-stakes battle is brewing where the Similkameen River flows into Washington State as a result of a proposed American dam that may flood an endangered B.C. ecosystem.

Up until 2007, the proposed dam was quietly slipping through the approval process until the Canadian Parks and Wilderness Society (CPAWS) gained legal status as "interveners" in the process.

At present, only CPAWS and the Okanagan Nation Alliance have legal status to block the dam as "interveners." Conservation groups are hoping that both provincial and federal governments will take a strong stand as well, forcefully directing Washington State to drop plans for the dam before it gets any further into the regulatory process.

The proposed Shanker's Bend Dam is poised to flood an already disappearing B.C. landscape that sustains at least sixteen species at risk. In the area that would be affected, rare bluebirds nest on Ponderosa Pines and rattlesnakes hide amongst large sunburned grasses. Bighorn sheep scale the mountainsides while the valley is inhabited by an array of wildlife, ranging from elk, moose and deer to pine marten, milk and long tailed weasels. Red and blue listed species, such as the White Throated Swift, Canyon Wren and Flammulated Owl are also found there. The river also supports abundant stocks of rainbow trout and mountain whitefish.

There are currently three options for the proposed dam being considered by US authorities. If the "high dam" option is selected, would flood the valley up to Cawston, about 12,000 ha in total covering parts of Hwy 3. Also affected would be two aboriginal reserves, two provincial protected areas, a potential national park, and high-quality agricultural land. It's also important to note that the Lower Similkameen First Nation has cultural sites on both sides of the border that would be impacted.

Given the potential impact to First Nations, Chief Phillip Stewart, of the Okanagan Nation Alliance, has understandably promised the Alliance will fight the proposal with everything they have.

In addition to losses that would be incurred as a result of flooding, even the low and mid-height dam proposals could impact the Canadian side of the valley from a micro-climate perspective. The traditional ability of wildlife species to move freely from north to south through this trans-boundary ecosystem would also be affected.

The dry, warm ecosystem found along the Similkameen is already precious, due to its scarcity. In recent years, rapid development throughout the Okanagan and Similkameen has wiped out massive tracks of natural dry ecosystems. To lose still more to flooding would be tragic.

In addition, a second possible dam on the BC side of the border is also causing some concern. The so-called "Canyon Dam" is an early-stage proposal from Fortis BC, which purchased the former Princeton Power and Light, the company that proposed a dam at this same site in the early 1990s. The dam, which could be up to 200 m high, would be built in the canyon 25 km south of Princeton. It is intended as both a power and a flood-control structure. Construction would create a reservoir upriver of the canyon that is estimated to destroy not only the canyon ecosystem, but 634 ha of wildlife habitat stretching 14 km south towards Manning Provincial Park.

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

A proposed independent power project threatens these creeks which are located close to Kaslo. However, in an encouraging development last fall, the Provincial Environmental Assessment Office "stopped the clock" on the review of this controversial project due to potential impacts on fish and fish habitat, noting that this posed "a significant challenge" for the proponent. For this reason, the river dropped a few spots from last year's list, although it's important to note that the project has not yet been withdrawn.

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 been the center of a major campaign in the Kootenays and many local respondents had expressed concern about the approval process for IPP's. Many also pointed to the lack of a broader regional (as well as provincial) strategy for such projects and the fact that such proposals have often not been included in land use planning processes.

The proposed Glacier/Howser project is a \$240 million 125MW development 100 km north of Nelson, B.C. They were awarded a B.C. Hydro contract in the 2006 Call for Power. 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.

8. Elk River

Located in the southeast corner of the province, the Elk River sustains a thriving population of genetically pure west slope cutthroat and bull 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 critically 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 another 5 are on the horizon. 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.

9. Coquitlam River

The Coquitlam has 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, during 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 need to do 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. This also highlights the need for a set of river-related indicators to be developed, and regularly monitored, so that local authorities can better assess what progress, if any, is being made.

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. The work of this committee, which includes gravel industry representation, is important to the future health of the river and their efforts are to be commended.

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. 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.

10. The Salmon River

The Salmon River, whose flood plain is located just outside Fort Langley, is one of the few remaining waterways in the lower Fraser that retains its natural characters and meanders. But while the river has avoided dredging and straightening to date, it remains under pressure from a variety of sources. In addition, like many south-coast streams, spawning coho numbers have dwindled significantly in recent years, perhaps hitting new lows of less than 1000 fish. Yet, as recently as the mid 80's, the run was more than 20,000 in size and historically, is thought to have been in the 60,000 to 100,000 range.

Despite the river's attractive natural attributes, it is endangered as a result of several different threats.

a) Falling water tables (averaging 1 foot per year for 30 years) are causing reduced stream flows during dry summer months. Once again, a lack of groundwater legislation has made it difficult for governments to mitigate excessive water extraction and losses due to flowing (artesian) wells. Similarly, the Water Management Plan developed in Langley over the last 3 years does not contain all the measures needed to deal with the issue. There is concern that the extremely productive middle reaches of the river may dry out in some summers with catastrophic consequences as coho mature in the stream for a year before migrating to the ocean. There is already evidence that juvenile coho numbers are declining during recent dry summers.

b) Pollutants from the excessive use of manure continue to find their way into the river from nearby farming operations and septic tanks. Nitrate levels in wells and the river, as monitored by local river stewards, often exceed Public Health standards. Regulations to deal with this issue are either absent or are not enforced. On the positive side, the moratorium on development in the area to allow time to deal with the water issues is still in place - but is under pressure to be withdrawn.

c) Development pressures are increasing dramatically and there are currently many applications for ALR exclusions throughout the watershed. The watershed is fast becoming the test area for ALR protection in BC.

d) The Fort Langley floodplain is in danger. Local farmers are suing the Township of Langley trying to force dredging of the river despite evidence suggesting this would likely not make a significant difference to flooding. Such dredging could also adversely impact the productivity of the river ecosystem and the floodplain.

e) Misc. concerns - the DFO has cancelled the 25 year old monitoring program of smolts and spawning adults on the Salmon River, a source of important data for river managers and stewards.

11. Bute Inlet Rivers - While temporarily placed in a holding pattern given that the proponent has postponed submitting their Environmental Impact Statement (EIS) and stated they will not be pursuing an Electricity Purchase Agreement (EPA) at this time, this extensive IPP proposal including 17 diversions remains a concern to many respondents and stakeholders. This is largely due to its unprecedented scale and its potential impact on both fish and wildlife values. There are also concerns about cumulative impacts that may be associated with such a development. Whenever the EIS does come forward, both provincial and federal environmental assessments will

be triggered. It also remains to be seen how the new Green Energy Act will impact projects such as this.

Rivers to watch in the year ahead –

The Taku River

As salmon populations decline and river waters warm in southern BC, the transboundary Taku River in BC's northwest corner has become even more important as a sanctuary for wild salmon, as well for the bounty of other flora and fauna that call this 18,000 km² watershed home.

There are no fish farms along Taku salmon migratory routes, and the entire watershed is unfettered by roads. As a result, the Taku and its many tributaries support healthy runs of all five species of wild Pacific salmon along with valuable commercial and subsistence fisheries in both BC and Alaska. It is the third largest salmon producer in Canada.

However, the location of mineral deposits and three historic mine sites on the Tulsequah tributary, just upstream from the most productive salmon-rearing habitat in the entire watershed, pose a potentially serious threat to salmon and the species that rely on them.

Until recently, Redfern Resources was working to reopen the Tulsequah Chief mine, one of the company's two sites in the watershed (both abandoned since the 1950's). Redfern had essentially gained approval for the mine before going bankrupt in 2009.

Today the threat of mining upstream from key salmon habitat is more precarious than ever. The land use planning (LUP) process underway between the BC government and the Taku River Tlingit First Nation (TRTFN) has the potential to make, or break, the Taku's future. Historically, the Tlingit have not opposed mining, but are strongly opposed to proposed road access through their traditional lands,

which has helped keep new mines at bay. During the land-use process however, BC has insisted on keeping the Tulsequah tributary open for mining and has refused to negotiate this point. In addition, the Province is maintaining the right to build roads to this and other locations, even through the traditional territory of the TRTFN.

If this situation persists, there will be little to prevent mines from developing, raising concerns about potential impacts on fish. As an example, the original Tulsequah mine site has been a notorious producer of acid mine drainage. However, while this is a very real concern, it isn't the only possible outcome. As much as the land use planning process has the power to devastate the river's sensitive ecology, it also presents an opportunity to safeguard it. However, the protection of salmon and their habitat must be given the attention and priority it deserves in the final land use plan that's developed. Stay tuned!

Flathead River

The recent BC throne speech stated the Flathead River, once BC's most endangered, would now be protected from projects such as the Cline open pit coal mine proposal. This was great news and was positively received from the conservation community across the province. Consequently, the Flathead fell off this year's endangered rivers list for the right reasons. However, as of yet, nothing has been formalized in terms of ongoing protection. Hence, the river remains on the "watch list" until this occurs.

In closing, according to Mark Angelo, Rivers Chair of the ORC and Chair of the Rivers Institute at BCIT, "the issues outlined in this year's list are extensive and diverse, ranging from the importance of pro-actively protecting productive salmon rivers and ensuring adequate water management policies are in place to the need for improved riverside habitat protection and better collaborative planning.

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".
