

2007 BC Endangered Rivers list
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This year marks the 15th annual “most endangered rivers” release from the Outdoor Recreation Council.

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, the ORC solicited nominations from its 120,000 members which represent most of the conservation and recreation groups in 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 many of BC's best known river conservationists

I might also add that this list is not meant to be all inclusive in that our first short-list included several dozen rivers

But the river issues on our final list are those deemed to be most urgent

With that, I'll review this years results;

#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 faces an array of threats. Foremost of these is the proposed Cline open-pit coal 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 - US 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 river 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 - and 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 (often referred to as the Lodgepole Mine) 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 growing and 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 currently 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. 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 uncertainty, 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 are also dismayed 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 would 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 proposed coalbed methane developments along with the associated infrastructure of roads and pipelines. In addition, a new forestry road is being considered for the upper Flathead while land development and uncontrolled motorized access are also 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 Capilano - and other Greater Georgia Basin Steelhead streams. - The Steelhead has long been a symbol of "super natural" British Columbia. Yet, stocks are in decline or considered "at risk" on a number of streams in the southern part of the province. This is

particularly the case for mainland rivers such as the Capilano, Seymour, Coquihalla and Cheakamus as well as streams on the central east coast of Vancouver Island, such as the Englishman and Puntledge. (The Greater Georgia Basin is defined as Johnston Strait to Juan de Fuca Strait including the east coast of Vancouver Island and adjacent mainland coast and lower Fraser River).

But while steelhead stocks are troubled, there are local waterways right on the north shore of Vancouver where significant steps could be taken by governments to turn things around. Nowhere is this more obvious than the Capilano River. If this is to be achieved however, several major (and long-standing) in-stream habitat issues will have to be addressed.

In the case of the Capilano, where just a handful of summer steelhead remain (as of Feb. 26th, the hatchery had only one summer steelhead in holding and has received adequate brood stock in just one of the past 4 years), one of several major issues centers on a design flaw with the dam itself in that it does not have enough ports or release valves. As a result, most water released from the dam into the river during summer months comes from the bottom of the reservoir. Consequently, the water that is released into the river is extremely cold and does not provide optimal conditions for the growth of young steelhead.

To correct this, there is an urgent need for the installation of a multi-port mechanism that would enable the withdrawal of water from multiple depths, which would allow managers to better control stream temperatures and would greatly benefit the survival of young fish.

A second major issue centers on the need for improved smolt passage. The reason for this centers on the fact that most of the best rearing habitat for young fish along the Capilano lies above the dam and, in recent years, the hatchery has trucked both coho and young steelhead upriver to rear. However, when these young fish become smolts and go to sea, they have to travel over the dam's spillway where well more than half die, often as a result of the large rocks at the base of the dam. If these rocks were removed or broken up, survival rates would increase.

However, the best approach would be to install a smolt passage facility entailing a directional net and flume at the top of the dam. This would deliver most young fish safely to the bottom of the structure. Such a mechanism has worked well elsewhere and was outlined to the GVRD in a recent report prepared by Peter Ward and Associates.

While the cost of installing **both** the smolt passage facility along with the upgrading of the port release mechanism may cost several million dollars **in total**, this is just a small fraction of the almost 1.5 billion dollars now being spent on the Capilano-Seymour water system upgrade. In addition, the GVRD is also proposing to install a hydro-electric plant at a cost of more than 20 million dollars.

But most importantly, if this new power plant along with the pump station (which is a key part of the Lower mainland's water distribution system) is to be considered environmentally sustainable - and if the GVRD has a serious commitment to the liveable region strategy and its own bio-diversity policy, fisheries related impacts associated with the dam must be dealt with in a positive manner.

Still another required step centers on the need to improve fish habitat below the dam and includes the placement of gravel in key areas so as to enhance spawning terrain. This is required because the dam has blocked the downstream movement of gravel (as well as large woody debris) over the last several decades.

And finally, there is a clear and urgent need for a workable water flow agreement that adequately considers fisheries values. At present, there is no such agreement and, without one, the future of adequate flows on the river below the dam remains in question. To further complicate matters, the new pump station on the Capilano that will send water to the Seymour for treatment has been built to a capacity that is 50 to 60 % higher than current withdrawals (the existing water license for the Capilano allows 840 million litres a day to be withdrawn). This is cause for concern because the river and its fish stocks are already threatened by periodic low flows under the current situation and no license for additional water was allocated or licensed

before the new pump station was built. This has created additional uncertainty around the issue of adequate flows - and, once again, highlights the need for a proper water use plan.

In terms of the state of Steelhead stocks elsewhere in the Georgia Basin, there is some reason for hope in that recent returns over the past several weeks have been slightly higher on some river systems than in recent years - but the long term trend remains worrisome.

While ocean conditions are certainly a factor in this decline, the protection of habitat is also a key part of the equation. In fact, increasing freshwater productivity can be helpful in compensating for cyclical reductions in marine survival. Yet, riverside habitat along many of these rivers continues to face development pressures which can compound existing problems associated with urbanization, water extraction, water contamination and the destabilization of steep banks.

On a more positive note though, it should be noted that on some rivers, such as the Englishman on Vancouver Island, a number of key river-front lands have recently been acquired and protected through the good efforts of Nature Trust. On still other rivers such as the Seymour (where Steelhead have been designated as an extreme conservation concern), a formal round table of partners or stakeholders, led by the DFO and Seymour Salmonid Society, has been established in an effort to aggressively address steelhead-related issues in a holistic way. These are positive occurrences but the outlook for steelhead on most south coastal streams remains uncertain at best.

As a result of poor steelhead returns, the BC government has imposed very restrictive regulations including an outright closure on a number of rivers. This has dramatically reduced angling effort throughout the region.

While poor ocean conditions have, without question, influenced the current situation, the deteriorating condition of many fresh water habitats cannot be overlooked - and decades of industrial development

combined with the cumulative impacts of urbanization have had a profound impact.

In terms of what can be done, while longer term approaches to controlling greenhouse emissions must be pursued by all levels of government, shorter term strategies such as the Georgia Basin Steelhead Recovery Action Plan (released in 2002 by the Pacific Salmon Foundation with funding from the province and which is intended to stabilize and restore Steelhead stocks) is a step in the right direction and must continue to be acted upon. This initiative has identified 58 high priority watersheds and should be strongly supported by government from both a policy and funding perspective.

And while remaining healthy habitat along these rivers must be protected, efforts to restore previously damaged habitat must also continue. On a positive note, such efforts may be funded as part of BC's Living Rivers Trust Fund initiative. Habitat restoration projects under such a program could include improvements to spawning terrain, enhanced fish passage on impeded rivers, side channel development and the establishment of conservation flows.

Specific projects that would have significant benefits include improving summer and fall flows on rivers such as the Cowichan, Little Qualicum, Englishman and Theodosia. In a similar vein, the Seymour and Capilano Rivers on the north shore of Vancouver would benefit from improved water releases from the dams on these waterways which should strive to increase summer and early fall flows. The current low flow conditions that we see regularly on these waterways each summer takes a significant toll on fish in terms of reduced habitat, more difficult access and unsuitable water temperatures.

Still other examples of various restoration activities that are needed include the placement of large woody debris, which could benefit fish stocks on rivers such as the Squamish, Seymour, Chemainus and Englishman. Some work along these lines has already been done along parts of the Seymour, which has helped to provide increased cover and refuge for juvenile steelhead.

Finally, we have witnessed some improvements in stream productivity associated with the stream enrichment efforts on rivers such as the Keogh near Port Hardy. This has entailed the addition of minute amounts of nitrogen and phosphorous which helps to promote algae growth. This results in increased insect populations which, in turn, provide additional feed for young fish. On the Keogh, this has helped to significantly increase survival rates for young salmon. Consequently, the government should be encouraged to initiate similar programs on other high priority watersheds.

“In closing, the Steelhead, which many view as a sea-going trout but which is, in fact, a salmon, is an incredibly beautiful and strong fish which has garnered a passionate following amongst river stewards throughout British Columbia. Yet, its endangered status in much of the Georgia Basin has not received nearly the same profile as other threatened salmon stocks. The fact that the Capilano River in particular, and Georgia Basin Steelhead streams as a collective, are so prominently listed will hopefully provide a greater awareness and appreciation of the plight of this species, which in turn may help to turn things around for the better.”

#3. Coldwater River;

While there have been improvements on the Nicola River system over the past 18 months, there remains significant concern about one of its key tributaries, the Coldwater River. On a positive note, the drought conditions that had existed in this area in recent years have eased somewhat and there will likely be some benefits from a good snow pack this year. However, 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. Also, if snowpacks melt too quickly this spring, this may again cause 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. These rivers 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. 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 the BC Wildlife Federation 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 hundreds of 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 there should be a moratorium 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 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 on this list continues to reflect the broader need to better manage BC's water resources and, 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

The Fraser drops to the number four position this year but remains in the top 5 for the 13th time in 14 years. 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 missing sockeye salmon, low summer flows, unchecked agricultural impacts and reduced protection for many urban stream tributaries.

In addition, the river continues to be threatened by impacts associated with rapid urbanization, urban run-off, extensive logging in its headwaters, widespread bank armouring, industrial pollution (especially along the north arm) and rapid development along its most productive stretch. There are also a number of old contaminated sites that continue to be problematic and an array of new development proposals near Iona Spit on the north arm, ranging from airport expansion to a new ferry terminal, are also causing concern.

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 many of the most pressing issues facing the Fraser are not being addressed to the extent they should.

One of the most publicized events of 2004 was the mysterious disappearance of large numbers of sockeye salmon before they could return to their spawning grounds. 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, it appears as though another 1.4 million sockeye may have disappeared, although this is a preliminary estimate.

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 (on top of similar, but less severe instances in recent years) indicates 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 clear need to allocate additional resources to the DFO so that they can fulfill their management and enforcement obligations. 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.

Still another example of the many diverse issues facing the Fraser occurred in early March, 2006, when the building of a berm to access Big Island near Rosedale for gravel extraction effectively dewatered a major back channel, destroying literally thousands of redds and killing millions of alevins, or newly hatched pink salmon. The use of adequate culverts, or the building of a bridge to access this gravel bar would have prevented this from occurring - and the fact that events like this continue to happen startled and angered many river advocates.

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 increasing concerns about the potential for human health implications. Yet, this past winter as in previous years, a number of offences were cited but seldom acted upon, in part because of current policies and/or a lack of available staff.

In terms of mitigating agricultural issues, there must be increased efforts to enforce existing regulations and there's a need 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 can also present an opportunity to protect stream habitat and 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. But while it holds much promise for the future, this initiative has yet to be widely

implemented. Yet, river advocates remain hopeful though that it will expand significantly over the next few years.

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 9 million pink salmon spawn in this part of the Fraser mainstem in peak years and million 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 BCIT, the Nature Trust, the North Growth Foundation, the PFRCC and ORC). However, there will also be extensive efforts to work with First Nations and various governments in the hope that certain key crown lands might also be better managed or protected. This 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).

MP Randy Hawes also recently advocated a linear park along this part of the river which is completely complimentary to the Heart of the Fraser campaign and would also be very helpful in protecting both recreational and environmental values.

And finally, there's an urgent need for an integrated approach to reducing the flood risk along parts of the lower Fraser. And while there

continues to be debate over the extent to which gravel extraction will take place as one component of such a strategy, senior governments have complicated and worsened the situation by not adequately contributing to the improvement of the Fraser Valley dike system. In our view, it has been unfair to fully offload the financial burden for upgrading and improving dikes onto local governments. There is a pressing need for 20 to 30 million dollars in dike upgrades and repairs that would help to protect more than 6 billion dollars in existing infrastructure. The federal government should contribute to this just as they've done in similar circumstances in and around Winnipeg, Manitoba.

Consequently, we hope the federal government, as well as the province, will initiate a greater investment in the repair and upgrading of dikes, which is the most effective way of preventing flooding events. This would help lead to a more integrated and sustainable approach to flood control as opposed to forcing local communities to explore the more invasive option of gravel extraction as the only tool available.

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 a host of 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, as outlined in the Heart of the Fraser initiative (www.heartofthefraser.bcit.ca) would be helpful in sustaining the exceptional fish and wildlife values that exist along one of the world's most productive river sections".

5. Coquitlam River - The Coquitlam has unfortunately appeared on this list many times - and once again, 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.

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. The settling pond failure that occurred in 2004 was also a troublesome event. 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 it's estimated that for close to 200 days each year, siltation levels along much of the river are considered to be at levels deemed harmful to fish.

If this situation is to finally be 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 addressed. And given that both BC Hydro and the GVRD have been a major extractor of water (which often worsens the siltation issue due

to less dilution and lower flows), many believe they should also be significant financial contributors to the restoration of this waterway along with other stakeholders, including the gravel sector.

Other problems in the watershed include rapid urbanization and urban runoff. The advent of additional bridges coming on line 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.

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.

#6) Taku River – Located 100 km south of Atlin, BC's most threatened wilderness river faces the prospect of a controversial proposed mine. Concerns about this proposal were further heightened by the federal government's tacit approval of this project. In addition, the province recently granted a permit to Redcorp Ventures to develop the controversial Tulsequah mine.

River advocates have expressed concern about acid leechate problems, particularly in light of ongoing leechate (or acid mine drainage) problems associated with earlier mining activity in the area. There are also concerns about the adverse environmental impacts associated with the proposed use of hover barges to move the mined material. Barging-related concerns range from the potential to alter the structure of the river to wake-related impacts and the need for on-shore infrastructure. If barging proves not to be feasible, a proposed 160 km access road would have to be built to access the mine.

The Taku drainage is one of BC's most spectacular wilderness areas with significant wildlife and fisheries values. Earlier court decisions ruled that government must adequately address the concerns of the

Taku River Tlingit First Nation before a permit for the project was issued. However, the re-opening of the mine has continued to edge closer to reality.

The members of the ORC believe that environmental and social concerns associated with this project have yet to be adequately addressed. There is also a growing concern about cumulative impacts in that Canarc is interested in re-opening the controversial New Polaris mine which is across the river from the Tulsequah Chief. In addition, a comprehensive land use plan for the area is needed before such developments are even considered and there is a need for a more collaborative working relationship with the Taku River Tlingit First Nation. In the absence of the above, there is a rapidly growing concern that the adverse impacts of both the mine and associated transportation infrastructure (be it barges or a major access road) will far outweigh the perceived benefits.

#7) Cheakamus River

Among BC's most endangered rivers last year, the Cheakamus River canyon was the site of a major CN derailment in August, 2005, resulting in a toxic spill of more the 40,000 liters of caustic soda (or sodium hydroxide). This spill had deadly consequences, killing thousands of salmon, steelhead and trout and its effects on local fish stocks will be felt for many years. And while more than 500,000 fish were killed, the actual environmental, cultural and economic impact will be many times greater if the reduced size of future runs is also taken into account.

After a year and half, the investigation into the spill is still not completed – so there have yet to be any charges laid or fines levied. And while the river is starting to recover, the complete restoration of this renowned waterway will still be years in the making.

The spill killed both adult and juvenile fish. Species such as Pink, Chinook and Coho salmon as well as Steelhead were particularly hard hit as were other species such as sculpins, lamprey and trout. It's estimated that 90% of the fish in the river at the time were eradicated. In addition, the impacts on the broader ecosystem will be extensive in that many wildlife species that depend upon salmon will be adversely impacted. Also, many people have been personally affected from a cultural, recreational and/or economic perspective. In short, this may well have been the most catastrophic spill to have taken place in BC over the last several decades.

The CN derailment, in combination with the major flood event of 2003, has had a severe impact on the health of this river. The outlook for Steelhead stocks is particularly worrisome. In response, the province did launch a steelhead enhancement initiative but the results of this have not yet been determined.

The 2005 derailment also exemplifies just how damaging such a toxic spill event can be from both a short and long term perspective. Yet, the river continues to remain susceptible to future spill events. In response, Transport Canada initially ordered the imposition of an 80 car limit for conventional trains but trains with distributed power (which have engines in front as well as in the body) were still allowed to exceed that. Yet, it was a distributed power train that dumped its deadly cargo into the river.

In light of the 11 major derailments that CN experienced that year on former BC Rail lines, the ORC believes that further precautions must be taken and that car limits should be reviewed and applied along other routes. CN must also further demonstrate that it is, in fact, maintaining its lines to acceptable standards.

Furthermore, while the Chaekamus River canyon will soon receive a great deal of notoriety as the major gateway to the 2010 Olympics, rebuilding the river's fish stocks will prove to be a lengthy and expensive process.

Following the spill, some steps were taken to at least partially address some of the impacts. Some fish culture operations were ramped up including the release of many pink salmon fry along with the enhancement of steelhead stocks. In addition, CN has committed to donations over the next 5 years to the broader Squamish River watershed, amounting to \$250,000 per annum.

However, there is no easy fix to such a catastrophe and much remains to be done. In addition, CN should be fully responsible for all costs incurred in the development and implementation of an extensive "Cheakamus-specific" recovery plan aimed at trying to restore the river as quickly as possible.

In particular, aside from steelhead enhancement activities, such a plan would include in-stream restoration projects ranging from the careful placement of large woody debris (which would benefit species such as steelhead and chinook) to the development of additional off channel habitat (which could be very beneficial to coho). Given that a great deal of off channel work has been done in past though, the number of new opportunities for such projects may be limited.

The viability of stream enrichment options, which could ultimately result in the increased availability of insects as food for young fish, should also be explored. These and other actions could increase stream productivity, which hopefully will enable damaged runs to recover at a quicker rate. Such enhancement activities would also benefit multiple species and would be seen as a lasting legacy from what has otherwise been a tragic event.

In addition, if there is a need in future to manipulate and increase flows from the upstream Daisy Lake dam in order to benefit fish, then this should be done (although the current WUP is deemed to be fairly effective for juvenile fish).

It is assumed that the total cost of improving the river's productivity and restoring fish stocks will significantly exceed the funds that have been allocated to date. Consequently, the province must take

whatever steps are needed to ensure that CN is financially responsible for all associated costs.

And finally, many stewardship groups have done a tremendous job in an effort to protect and care for the river. Their input and participation in the recovery process is essential and they should receive all the support and assistance they require as efforts unfold to fully restore this once prolific waterway.

#8) Okanagan River – For decades, the Okanagan River has been damaged by channelization, water extraction, urban encroachment, riparian habitat loss and the building of dams and weirs. In many sections, it now resembles more of a ditch than a river.

In addition, there are still serious issues pertaining to water management, examples of which were cited throughout much of the watershed. Among these were the inadequate management of groundwater, the over allocation of water licenses and the unauthorized removal of surface water.

On the bright side however, a strong effort is underway to try and restore this great waterway - and, while you can't immediately turn things around for a river that has been abused for so long, some progress has definitely been made.

As an example of this, the Okanagan River continues to be an ideal candidate for a major habitat restoration initiative that would include a significant “de-engineering” component. Some of this work has already been done and, if such work continues, this could dramatically improve the state of the river. Kudos for this must be given to the many groups and individuals throughout the Okanagan basin that are working to restore the river.

Because of their efforts, a major restoration initiative is now being formulated by staff within the Ministry of Water, Land and Air protection and the Okanagan Nation Alliance has been an especially strong advocate for this. The ORC supports this proposal and we

believe it should be endorsed, and funded, by both the federal and provincial governments. The annual return of significant numbers of sockeye (one of only 2 significant remaining populations in the Columbia drainage) to the Okanagan River system also reinforces the potential of such a program – and the recent re-introduction of sockeye to Skaha Lake is an exciting recent development.

Over time, such a restoration initiative could improve flow regimes, enhance off channel habitat and improve fish passage. Riparian habitat could also be restored in many areas, which would enhance fish values as well as improve wildlife habitat for red-listed species such as the tiger salamander and western screech owl.

Specific fisheries enhancement measures might include the building of set back dykes, land trades, the restoration of meanders, riffle-pool construction and perhaps even the decommissioning of the McIntyre dam.

On another positive note, within Douglas County near the town of Oliver, a very successful habitat restoration project was undertaken a few years ago which created several hundred meters of renewed fisheries habitat. This proved to be very successful and is an example of the restoration possibilities that exist.

#9) The Stikine/Iskut River system – While the proposed Bradfield Road appears to have taken a backseat for now, the Stikine-Iskut remains threatened at multiple headwaters by coal and coal bed methane exploration and proposed development. This area is proposed for protection as “the Sacred Headwaters”, and is the subject of an inter-nation indigenous people’s campaign to protect the headwaters of the Stikine/Iskut, Nass and Skeena Rivers.

However, Fortune Minerals has recently entered the EA process and is proposing a coal haul road through from the headwaters of the Little and Big Klappan drainages of the Stikine, through headwaters of the Nass and Bell-Irving Rivers. Shell Canada is also looking at Coalbed

Methane exploration and has drilled four test wells at the head of the Little Klappan and Spatsizi river, both tributaries to the Stikine.

The headwaters of the Iskut tributary is threatened by an approved open pit copper mine within the Todagin Wildlife Management Area, near Iskut BC. The plateau supports the largest lambing herd of Stone Sheep in British Columbia, threatened by copper dust that has been shown to be toxic to domestic lambs but has yet to be studied for impacts on wild sheep. Imperial Metals also awaits approvals for a BC Hydro transmission line 450 kilometers from Terrace BC. If the 287kV transmission line is approved, there will be a huge jump in concurrent mining and energy development across the Stikine/Iskut watershed which may well impact water quality.

There are also some concerns about the use of the Lower Stikine and Lower Iskut to dilute mining effluents from open pit copper mining, as per an approved BC Environmental Assessment comprehensive report.

In light of these developments, the Tahltan people stand to lose prime traditional use areas and other elements of their culture if a reasonable pace and scale of industrial development cannot be negotiated with the mining and energy industries. While there is not opposition to mining per say in the area, many respondents felt that a more reasonable plan would be to provide strong conservation measures for rivers up-front, while proceeding with mine development "one project at a time" as opposed to a boom and bust approach.

#10 tied). The Salmon River ; Appearing on the list for the fourth consecutive time, 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 a new low this year 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) Pollutants from the excessive use of manure continues to find its way from nearby farming operations. In fact, nitrate loads have been high enough intermittently that they exceed Public Health standards which in turn has led to a moratorium on residential development in the middle reaches of the stream. Residential development was restricted to cap nitrates and phosphates from septic tanks but little has been done to date to control agricultural run-off. This past year, local river stewards continued to monitor high nitrate and phosphate levels in the river.
- b) Flash floods in the stream due to runoff from land clearing and use of storm drains that direct water into the stream. This often causes damage during heavy rains due to higher than normal flow volumes.
- c) Falling water tables as a result of land clearing and development. This has reduced the quantity of water that would normally be held in the soil and through seepage, recharge the stream. Water tables are also being affected by excessive water extraction mostly by agricultural users (berry farms etc.). If current trends continue, there is concern that the extremely productive middle reaches of the river may become susceptible to the same thing. This past summer, as an example (at 248th street), water levels were extremely low.
- d) Pressure from farmers in the Fort Langley floodplain to dredge the river to improve their drainage.
- e) Ongoing interest in removing land from the ALR in the upstream part of the watershed for urban development which would exacerbate the runoff problem and increase the potential for flooding downstream. This in turn could increase pressure to dredge the downstream part of the river.
- f) Ongoing pressure to remove the existing moratorium on development above the Hopington - Salmon River Aquifer.

On a positive note, the province has indicated their intent to declare the local aquifer as a "groundwater management zone". While it's not yet clear how this will unfold, this initiative could potentially address some of the long standing concerns around ground water depletion.

Also on the bright side, local river stewardship groups continue to work hard to protect this waterway and the hope is that all stakeholders will come together and do what's needed to save one of the lower mainland's most beautiful local waterways.

#10 tied) **The Skeena** - The approximately 620 kilometre long Skeena River is second only to the Fraser with respect to salmon and steelhead production in British Columbia. World renown for both wilderness values and it's excellent fisheries, four of the five B.C. Class One waters (ie. top ranked streams considered exceptional due to both angling and aesthetic significance) are contained within the approximately 54 400 square kilometre Skeena watershed. While this system still supports many incredible values, it also faces an array of threats. It's inclusion on the list this year highlights the interest of many British Columbians in acting before the Skeena's world class natural values are diminished.

Potential threats include, in random order:

a. Mixed Stock Fishery:

As enhanced Babine sockeye salmon return to the Skeena River, commercial gillnet and seine fisheries intercept large numbers of steelhead and relatively less numerous wild sockeye and other species of Pacific salmon. 2006 saw 44 days of commercial fishing within a 71 day period including 11 days in a row of continuous fishery openings. At times approximately 400 gillnet vessels blocked the approach waters of the Skeena with their 150 kilometres of nets. The 2006 fishery was prosecuted in the absence of selective fishing methodologies and without adequate enforcement. Upon completion of the fishery, department officials revealed that the sockeye return had been overestimated by nearly one million fish. Consequently, steelhead, other salmon species and non enhanced sockeye stocks were compromised for a fishery that yields commercial fishers \$1.20 per pound for sockeye salmon landed. Yet, returning salmon and steelhead provide sustenance for First Nations people along the length

of the Skeena River and the in-river sport fishery is conservatively estimated to contribute over \$30 million dollars to the provincial economy annually.

Exacerbating concerns about the impact of the mixed stock fishery is a fairly steady decline in ocean survival for steelhead which, in all likelihood, is tied to climate change.

b. Encroaching aquaculture:

There is continued pressure to introduce fin fish aquaculture to the north coast. A relatively long standing proposal to place net pens adjacent to the mouth of the Skeena has been halted in the short term. However, mounting pressure from industry and both provincial and federal governments for open net pens in the north means the threat they pose to wild salmon continues to loom.

c. Canadian National Rail Grade Use Increase:

The imminent exponential increase in CN rail grade use to service the Asia Pacific Gateway threatens Skeena River salmonids given CN's recent track record for derailments (on rivers such as the Cheakamus and Thompson). Upon completion of phase one, the Fairview container facility in Prince Rupert will be able to accommodate half a million container units. Upon completion of phase two of the project, predicted by 2010, the capacity of the Fairview Terminal will be 2 million units

d. Mineral Extraction Activity, Old and New:

With mineral claim staking now possible via the internet, there has been a rapid increase in the number of mineral extraction proposals. It is of significance that permits are no longer required of proponents to create access during mineral exploration.

Two recently proposed molybdenum mines in the Smithers and Houston areas would both discharge waste water directly into the Bulkley/Morice watersheds. World renown for their summer steelhead

fisheries, combined, they represent approximately 40% of the Skeena summer run steelhead aggregate.

The Equity Silver mine, near Houston and the banks of the Morice River watershed, is now inactive with the exception of ongoing reclamation activities aimed at reducing the harmful affects of ARD. 77.4 million tonnes of acid generating waste rock were removed from three open pit mines. A tailings dam failure would translate to the loss of all salmonids downstream to the town of Quick if a dam failure were to occur. The time span for reclamation activities is indefinite and hence, raises some important questions: Who will be responsible 100 years from now, and was the mine really cost effective given the hundreds of millions to be spent mitigating the impacts of past activities?

e. Coal Bed Methane:

Despite the environmental atrocities that have occurred in the last decade in North America as a result of coal bed methane (CBM) extraction, the provincial government continues to push for the development of CBM tenures. Proposed operations at the Sacred Headwaters, the source of the Skeena and neighbouring Nass and Stikine rivers, are poised to threaten the groundwater of these life producing water bodies. River bank coal fire generation systems and wastewater disposal into groundwater threaten these river's salmonids that exist as a result of the availability of relatively warm groundwater through the lean winter months. Shell Canada has been granted exclusive rights to the CBM producing land at Mount Klappan. While the province has recently stated its support for injecting wastewater deep underground below aquifers, there is still concern in that such an approach is largely untested.

f. Coal Mining:

At a time of increased awareness about global warming and the harmful effects of hydrocarbon combustion, it seems inconceivable that the process for the development of coal mines within B.C. is actually being streamlined. Coal mining tenures granted along at

the Sacred Headwaters, for high quality anthracite coal, and along the banks of the Telkwa River threaten valuable fisheries habitat in more ways than one. Major proponents include Fortune Minerals and Northwestern.

g. Pipelines:

There are currently 5 major pipeline proposals involving hundreds of Skeena Watershed tributary crossings. In addition to potential failures and the habitat impacts associated with construction and maintenance, Pembina, Pacific Northern Gas (Summit Lake Looping Project), Enbridge/Gateway (double lines), Encana/Spirit and Kitimat Liquid Natural Gas propose to construct pipelines to move the products of the Albertan tar sands, condensate, natural gas and liquid natural gas within the Skeena watershed.

h. Independent Power Projects:

IPP proposals continue to appear monthly aiming to generate hydro-electric power by diverting Skeena tributary streams and running the water through power producing turbines. In addition to the potential for periodic significant reductions in water flows, fish passage is threatened at a number of sites. Sedan Creek near Kitwanga and a number of others in the Terrace area, are located near what is arguably the hub of sport fishing activity in British Columbia.

i. Other Linear Developments:

In addition to proposed and existing pipelines and rail grades along the Skeena and tributary streams, highway construction and associated maintenance (failures due to slides, winter snow and ice clearing et cetera) and B.C. Hydro Right Of Ways all take their toll on the Skeena River watershed both through incremental introductions of deleterious substances (sediment, road maintenance chemicals) channelization and isolation of habitat. Chum salmon in particular, a species which depends

upon off-channel habitat for spawning in the lower reaches of the Skeena watershed, have suffered from the habitat fragmentation that results from linear developments such as these.

j. Forestry Activities, Mountain Pine Beetle (MPB) Salvage:

Aggressive timber harvest activities, some aimed at recovering MPB impacted stands of timber lead to changes in surface and groundwater flows through both the removal of live and dead trees and the associated construction of road networks to facilitate access. In some cases, the removal of forest cover and the acceleration of runoff leads to sediment pollution. In others, increasing temperatures exclude some species from their indigenous habitats (e.g. Such as the highly temperature-dependant and blue listed bull trout).

Rivers and issues to watch in the year ahead;

1. **Upper Pitt;** The Upper Pitt River, which produces one of the largest populations of coho in the Fraser River system, is under threat by a series of 'small' hydro facilities (IPP's) being proposed for this area. The proposal calls for one of these facilities on several major streams in the area; at least six in all. With the facilities will come the roads to build/service the power plant and of course transmission lines. The valley is small and any intrusion such as this could have a major impact on fish habitat. Concerns remain about the extent to which these projects will be assessed prior to approval and, in light of the number of proposals, there is also the potential for cumulative impacts.

2. **The impacts of Bill 30;** There remains concern about last year's passage of Bill 30 which eliminated the right of local and regional governments to restrict the development of IPP's on certain rivers. This appears to have been in response to the Squamish Lilloouette Regional District, which utilized its zoning powers to protect Ashlu Creek from an IPP proposal. They concluded that some rivers in their district should be protected from such development because of other

values, a position that ORC members agree with. This continues to be a contentious issue amongst many local governments and the Bill was strongly opposed by the Union of BC Municipalities.

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 the need to modify a poorly designed dam 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 has increased the support for the Living Rivers Program to a total of 21 million dollars. While this was an important step forward and the province should be commended, additional funds will ultimately 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) over the next couple of years.
