

Wild Salmon Alliance

BC's Wild Pacific Salmon Conservation Headquarters

http://www.wildsalmonalliance.ca/pivot/entry.php?id=22&w=my_weblog

The truth about abundant salmon runs and essential habitat.

I have recently had the opportunity to make a comparison of salmon bearing river systems on the north coast to evaluate the importance of salmon habitat and the climax rain forest canopy. The two areas I have reviewed are Rennell Sound (Queen Charlotte Is., Canada) and Ford Arm (south of Sitka, Alaska). The Rennell Sound side of the comparison is supported by the David Loewen report and a few comments from Tom Gray, a commercial fisherman. The Ford Arm information has been submitted by Leon Shaul, senior Coho biologist for SE Alaska, as a response to my article on the Rennell Sound, QCI area, and the David Loewen report.

We must appreciate the nature of this comparison in the arena of objectivity as the areas in question are only several hundred miles apart and are clearly equally advantaged in terms of ocean survival. This is a window to understanding the real difference in the long term salmon conservation management styles between Canada and Alaska. Canada has many salmon stock problems, some extinct, some near extinction. The Rennell Sound/Ford Arm comparison although at opposite ends of the salmon habitat spectrum is not an exercise in cherry picking. It is an exercise in understanding the salmon resource and the required habitat as it once existed in the pacific north west 100 or more years ago. This 100 plus year historic example actually exists to day in the Ford Arm (Alaska) example. I find the one word that best describes the Ford Arm example is "extreme". Extreme in every way, habitat, fishing pressure, returns, harvest, and extreme escapements. Although the commercial and sports fishing sectors pound the Ford Arm area with incredible pressure year after year, salmon continue to return as described by Mr. Leon Shaul in absolutely incredible numbers. Mr. Shaul spends a good deal of time in field in both Alaska and northern BC.

Although the Rennell Sound vs. Ford Arm comparison has been submitted to our

environmental friends sometime last year in its complete form, I think it a good idea that I postpone the Rennell Sound QCI (David Loewen) side of the comparison to focus on the Ford Arm old growth scenario. The Ford Arm example is the first step, or first real building block in the understanding of (what is?) essential salmon habitat.

Let's start with Ford Arm's "unaltered" habitat and advance our perspective as to how necessary habitat is to our most precious salmon resource.

Pay special attention to the description of the habitat in the Ford Arm area. It is described as "a wilderness area in a pocket of old growth in the very highest volume category". Now imagine the Ford Arm area clear-cut as in many areas of British Columbia with the associated long - term salmon stock devastation, displacement of user groups, and coastal viability issues. Mr Shaul's comments and conclusions as to why habitat is so essential are described in his last paragraph. Do not miss it.

My recent conversation with (Suzuki Foundation rep) John Werring regarding the comments (included) from Leon Shaul are not surprising to the Suzuki Foundation. Mr Werring suggested several studies comparing old growth, recently logged (less than 5 years), and logged over 40 years, validate Mr Shaul's evaluation.

Habitat appears to be the absolute essential component in regards to the moderation of water flow velocity, nutrient exchange, temperature control and, ultimately, abundant salmon runs. Our attempts in BC over the years to return more salmon or something near historic returns to degraded habitat has for the most part been a failed political exercise. The concept of protecting "unaltered habitat" as in the Ford Arm example is worth serious consideration as a model regarding the future protection of salmon habitat and salmon conservation efforts in BC. Nature has no understanding of Canadian politics, and clearly Canadian politics has little understanding of nature as it relates to abundant salmon runs. Nature knows no political negotiation, nature demands absolute compliance.

We must temporarily shelve our respective political stripes, some of our long held views regarding the term "conservation", and our historically misguided political focus on over fishing by the Canadian commercial salmon fleet to objectively evaluate the Ford Arm example and the Alaskan model. It is a good read.

Tom Gray

The following are excerpts from email correspondence with Leon Shaul, SE Alaska coho biologist, in January/February 2007. Also included are pics at Ford Arm of a streamkeeper pitching dead humps. Note the bear in the background.



From Leon Shaul, senior Coho biologist S.E. Alaska
Jan. 25 2007

Here's one more figure showing total run size, catch and escapement and goal ranges for four systems that have been monitored since the early 1980s. More have been added in recent years. In any case, these give you some idea of total abundance during that period. Smolt production has shown a fairly stable trend for Hugh Smith Lake and the Berners River, trended slowly downward over the long-term for Auke Cr. in Juneau (for what we believe are habitat reasons) and has trended upward at Ford Arm Lake . You will notice similar patterns among the three "inside" systems.

Now that you raised the topic of habitat - there's an interesting example here.

The Ford Arm system differs for a number of reasons. It's a small, compact system on the outer coast and shows a different marine survival pattern. It's unnamed on maps - we gave it its name when we started working there in the early 1980s because of its proximity to Ford Arm. It's located in a designated wilderness area in a pocket of old growth in the very highest volume category (our crew has measured individual spruce up to 31 feet in circumference) and has incredible overall fish habitat. The lake is narrow - just large enough to land a float plane on - and much of the best habitat is located in highly productive stream reaches loaded with big fallen timber.

The outlet has the highest average steelhead count per km of the monitored sites in Southeast Alaska . It has abundant populations of all species except chinook (which are typically not found on island systems in Southeast). In a few years, it

has ranked among the top 10 systems in the region in subsistence sockeye catch. The coho density per area or length would probably be hard to beat anywhere in the world with total runs up to 16,000 adults. The coho run mills all season in the area of highest trolling and charter activity in the region along the outer coast from Sitka to Pelican and incurs average troll exploitation rates above any other systems we've monitored, averaging 52% and reaching as high as 68% since 1982 (60% average for all-gear) . Recent contribution estimates to the marine sport fishery based mainly out of Sitka 45 miles to the south have been as high as 1,770 fish. We are unsure why freshwater production has increased as we cannot see any evident physical changes in the system that would account for it. However, we suspect it may be related to increased nutrient input from increasing pink salmon runs reaching ridiculous densities in some years that sometimes cause oxygen depletion and mass die-offs.

Anyway, here's an example of an anonymous system that was of largely unknown fishery potential and benefit before the early 1980s that, except for its wilderness status, could just as easily have been targeted for its timber before much was known about its fishery. Its just one of many little pockets on the coast and there could certainly be many other similar systems we don't appreciate yet. Here's a photo of one of the crew pitching dead pinks during high water in 2005 (note brown bear on the catwalk behind her). The section between the weir and the lake seemed about half water and half pinks. This past year, despite a poor overall pink run in the region with a total harvest of only 11 million fish, a record 948,000 pinks (many also bound for adjacent systems) were harvested by purse seiners in and around Ford Arm. This may not prove that high-volume old-growth stands are important to fish, but it would sure be hard to argue they're a bad thing. The importance of nutrient input by carcasses has been raised by numerous people, suggesting perhaps that fishing should be curtailed to increase marine derived nutrient loading to produce more fish and otherwise feed the ecosystem, but in order for it to really work effectively in providing net benefits to fisheries I think you first need high quality habitat to produce the fish to deliver the carcasses in high enough density to make a difference while leaving a harvestable surplus.

Regarding marine derived nutrients, there has been some very interesting research in Southeast very clearly demonstrating the benefits of pink salmon carcasses to coho salmon, and of course there has been alot of other work showing benefits throughout the food chain. It almost appears you almost can't get to many carcasses, even as evidenced at Ford Arm where pinks sometimes get so thick that they choke the stream causing massive die-offs that have in some years killed every bright adult coho holding in the outlet stream (816 dead and zero live counted after one event). However, just like "over-fishing" and "marine survival", there seems to have been an fixation on marine-derived

nutrients by some in isolation from other important factors. For example, one researcher proposed a certain level of loading by coho spawners for streams in Washington and Oregon based on carcass nutrients. The problem is that if you don't have the habitat to produce the smolts to return in those densities, or the channel structure to snag and hold carcasses, or the predators and scavengers to distribute them in riparian areas rather than flushing downstream, then you've really just created another unrealistic expectation aimed solely at fishery resource users that they are not equipped to meet. Nutrients are beneficial, but they are not the most fundamental building block or starting point. If you have quality basic physical habitat (water quality, temperature, gradient, flow and channel structure), you have the potential to produce abundant smolts that have the potential to survive in the ocean and return to benefit fishermen and the ecosystem. Without the habitat, you don't have that potential and you can't get it by further restricting fishermen or wishing for better marine conditions.

Thanks again for sharing your information and ideas.

Leon Shaul

Rennell Sound

Sept 2006

I have been reviewing a number of charts, graphs, and articles from one of my favorite publications, Spruce Roots magazine (www.spruceroots.org) published in the Queen Charlotte Islands. The article (included) I wish to bring to your attention is titled "**Dog, Salmon, Rolling, Rolling, Rolling**" by David Loewen in February 2000.

The article describes the required marine nutrient exchange from returning salmon to forest ecosystems and the demise of salmon returns to Rennell Sound QCI. The Rennell Sound article stats show a Dog salmon decline of 92% in fifty years. Mr. Loewen suggests that fishing and logging are responsible for "dramatically reduced salmon numbers". Most of the Rennell Sound salmon returning to the approx 17 streams are (80% or more) dog salmon.

As I reviewed Mr. Loewen's article I focused on his claim that fishing and logging were responsible for dramatic salmon declines. I have always found it interesting that when people speak to the decline of salmon stocks 'Fishing' is always mentioned first. It really doesn't matter if it's DFO, the media, conservationists, or the public we as fishermen are listed first as to reasons salmon are in decline. It's simply part of to day's Canadian mind set. Mr. Loewen has written an interesting article and is clearly focused on marine nutrient exchange. I found Mr. Loewen article interesting and a good read, but his 'fishing' comment I thought was knee jerk, something he has probably heard for the last thirty years. You know, an assumed fact.

I think it's time we advance the discussion to include or exclude the commercial salmon fleet in the last several decades in regard to the demise of salmon in the 17 Rennell Sound streams and possibly the entire Queen Charlotte Is.

Most of the returning terminal fish to Rennell Sound (Dogs/chum) do so in the fall. I have never heard of a Commercial Rennell Sound terminal fishery. I have commercially fished the QCI since 1980. So I thought to call my good friend Vic Fredette 250-559-4467 who is DFO's senior official and spokes person in QCI to review the Commercial impact on returning terminal salmon to Rennell Sound over the last fifty years.

Mr. Fredette is not aware of any commercial terminal fishery ever to have taken place in Rennell Sound and certainly not in the 26 years he has been with DFO on the QCI. Mr. Fredette suggested the problem with Rennell Sound salmon returns is the destruction of habitat. I did not take Victor's statement as an official comment.

I now have confirmation as to the physical absence of the commercial fleet, and what this historical absence may indicate on diminished salmon stock returns to Rennell Sound. I find the demise of returning fish to Rennell Sound has given us a unique window of opportunity to really learn something about the term "over fishing" and the demise of coastal salmon stocks in general. Let us explore the possibilities. Why haven't these stocks shown any sign of rebuilding in the absence of commercial pressure in 25-50 years? Do we need 100 years? I suggest that the trees in select areas harvested in Rennell Sound and on the Queen Charlotte Is years ago may have been worth far more (1000 + times) standing as habitat rather than clear cut? Producing quality food for the world population is fast becoming of serious global concern, and the production of high quality protein (such as wild salmon) is first and foremost in this challenge.

Shouldn't Rennell Sound be absolutely advantaged by it's geographical location to rebuild historical salmon

stocks on the west side of the QCI. Where is the pollution or population effects to Rennell Sound? There are none! All we see in Rennell Sound/QCI is habitat destruction. Has the clear cutting of the climax riparian rainforest condemned salmon stocks in the area of Rennell Sound? Have we condemned the status of SARA concerns, Gulf Coho, the Campbell River, Rivers Inlet (and the list continues) to a falling domino Rennell Sound habitat destruction scenario? Sadly this appears to be the case. The long term political spin on the demise and extinction of many of our wild salmon runs may cost future generations one of the most pristine sources of protein in world.

How is it that Alaska continues to shine with a very stable wild Salmon stock (Carl Burger report National Biological Service) and continues to fish with a viable fleet that is over three times our starving Canadian commercial Salmon fleet? How do we explain this magic wand scenario of salmon abundance in Alaska? Unaltered habitat?

Logging peaked in 1985 on the QCI, most of the salmon habitat has been compromised. We as commercial fishers have experienced poor returns to QCI in the last 10 -15 years. The Rennell Sound scenario is present in all QCI terminal salmon fisheries today. Who or what is at fault, over fishing or habitat destruction?

The *Wild Salmon Policy* is now advertising or promoting the words habitat, habitat destruction, or habitat restoration. In all the printed matter I have reviewed, I couldn't find the words "over fishing" in related new wave *Wild Salmon Policy* material. As the north coast Commercial Troll delegate to the WSP, I pointed this WSP exclusion of the term "over fishing" out to attending WSP representatives during our first meeting. There were no comments from DFO or attending delegates. Over fishing by the commercial salmon fleet as it relates to salmon stock demise today in Canada is just political carnage from a failed media, DFO, and related interest group campaign. Maybe I missed the words 'over fishing' in the *Wild Salmon Policy*? Maybe lots of people in lots of organizations missed a lot of things in the last thirty years?

Many Canadians would love to continue to blame someone in the commercial fishing industry for the demise of salmon on the QCI and in Rennell Sound. I truly think this is human nature , but maybe we should try? The Troll fishery is an early fishery. When salmon, mainly dogs, return to Rennell Sound in the fall the troll fleet has long since departed for home. We really can't blame the net fleet in a terminal area with no historic openings in over 25 years I really don't think we can blame the Alaskans? This looks difficult. We really can't play the (DFO excuse of) warm water card here as the Alaskan salmon returns only a short distance from QCI have been incredible in the last twenty years. Ottawa's DFO spin doctors may find the Rennell Sound/ Alaska example a most difficult challenge.

I suggest that the demise of salmon in Rennell Sound QCI has been driven by habitat destruction almost exclusively. I suggest that the new wave *Wild Salmon Policy* and it's focus on habitat and habitat restoration speaks to the Rennell Sound scenario. Unfortunately, the *WSP* does not address our displaced commercial salmon fishing families, our viability, or the thirty year over fishing campaign. The Rennell Sound example is representative of the entire QCI and, in my mind, most of the BC coast. The recent announcement by DFO in the spring of 2006 stating QCI Coho are now stocks of concern is yet another example of habitat destruction. These QCI Coho stocks like the demise of the Rennell Sound fish do not appear to be caused by the commercial fleet in Alaska or on the Canadian side. I would love to hear from DFO as to comparing QCI Coho stats with southeast Alaskan wild Coho numbers. Clearly the Canadian numbers are extremely embarrassing. Look for DFO to avoid at all cost any comparison with Alaska. The Alaskans may not be lily white, but conservation, stewardship and unaltered habitat belong to Alaska.

The new DFO political spin is a simple one. The long running "Political Dogma" in down loading the effects of the fore mentioned habitat destruction to commercial salmon families has lost the ring of public marketability in Canada. The new DFO spin doctor campaign must distance it self from the old failed thirty year 'over fishing

campaign' and speak to the awareness of habitat and habitat restoration as stated in the new *Wild Salmon Policy*. Accountability in regards to habitat destruction is not part of the *Wild Salmon Policy* new wave "politically green" agenda. We, as commercial fishermen are the sacrificial lambs; the politically expendable Canadians displaced by extensive habitat destruction. Commercial fishing families need a buy back (or compensation in times of conservation as in US) as stated in the Fisheries Reform Package (pg 23). We must make this a priority to return to some degree of promised (DFO) coastal viability. Quotas and/or picking the last dozen fish apart between dependant user groups is clearly an exercise in politics and a failed exercise in everyone's viability.

The BC coast has been extensively damaged by the destruction of salmon habitat. At the first meeting of delegates to the Wild Salmon Policy there was a DFO rep that described habitat problems in BC as "death by a thousand cuts". As we continue to burden and witch hunt commercial salmon fishing families in Canada over the last thirty years, salmon stocks continue to decline or become extinct. This long term approach has clearly failed all dependant user groups and the people of Canada. It's interesting that our US friends have taken a progressive approach and do not blame commercial fishing families for salmon stock demise. The US has taken the high road, they have come to terms with long term habitat /ocean survival issues and structured a compensation package in times of extreme stock concern. The contrast between the Canadian conservation approach and the U.S. in this regard speaks to responsible government and accountability.

The onus of conserving wild salmon due to the demise of habitat over the last 100 years is squarely on the shoulders of the People of Canada. It was the People of Canada and elected political officials that chose to promote the destruction of salmon habitat for short term profit, not dependant commercial fishing families. Conservation should not burden nor does it belong exclusively to commercial fishing families. Conservation belongs to the people of Canada on an equally shared basis. Commercial fishing families are not the perpetrators of habitat destruction and the demise of salmon, we and dependant coastal user groups (native, non native, sports, etc) are simply the victims. The long term demise of our coastal salmon runs in the past has had everything to do with politics, resource lobbyists, and the destruction of habitat and very little to do with real conservation. The people of Canada and dependant user groups must journey to a new elevated awareness regarding salmon conservation and essential habitat. It will eventually bring them closer to the truth.

Tom Gray, Habitat Activist Fanny Bay BC

(250) 335-0584

Dog, Salmon, Rolling, Rolling, Rolling

by David Loewen

Research on salmon has been conducted close to 100 years, but not until the last decade has one of the most important links been discovered between spawning salmon and ecosystems; a link which is obvious to many, especially gardeners. The return of salmon to their natal stream (place of hatch) is vitally important to the function of ecosystems on the coast and has been for thousands of years.

While preparing a report for some recent stream assessment work in Rennell Sound, I discovered some rather surprising information. A comparison of salmon escapements by decade from 1950-1999 in six streams draining into Rennell Sound showed dramatic declines in spawning salmon. The most astounding, a 97% decrease in spawning chum salmon, in four decades!

Salmon escapement is the number applied to adult spawning salmon which manage to return to their spawning stream. Salmon escapement is determined by a fisheries officer or creek guardian walking a stream and estimating by species, the total number of spawning salmon. These numbers are then published in a catalogue produced by Department of Fisheries and Oceans Fish Habitat Inventory and Information Program (FHIIIP). It is widely recognized that escapement estimates are obtained with a variety of techniques, so differences in enumeration methods from year to year can affect the reliability of data. Therefore, escapement data is only a general indicator of species composition, distribution, and abundance.

Here on Haida Gwaii, escapement numbers are generally concentrated on larger, easier to count salmon runs such as chum and pink. Coho are difficult to enumerate as there are far fewer fish in the stream, they are quite secretive hiding under cut banks and coho migrate much further upstream than chum and pink.

Table 1. A comparison of escapement counts in Rennell Sound (17 streams) by decade, from 1950-1999

	Coho	Pink	Chum
1950-59	4,648	374,875	222,650
1960-69	1,935	169,225	78,180
1970-79	513	438,095	94,401
1980-89	649	216,838	46,791
1990-99	1,502	122,764	18,394
Decline in 50 years	68%	67%	92%

In four decades, salmon populations in Rennell Sound have declined dramatically. Coho by 68%, pink by

67%, and chum by 92%. A comparison of total salmon composition shows that approximately 85% or 14 of 17 streams in Rennell Sound are comprised of over 90% chum. An important and interesting statistic why? Fishing and logging, two former economic pillars of the coast, have dramatically reduced salmon numbers and despite nearly a century of research, not until the last decade has the destination and importance of salmon derived nutrients been discovered. The main gist in this research has been tracing nitrogen (N) and carbon (C) derived from salmon carcasses, through the ecosystem. Yes, those smelly, stinky, maggot infested salmon carcasses that dogs love to roll in are very much a keystone of the ecosystems they rot in. Research conducted by Dr. Tom Reimchen in Gwaii Haanas and other regions of coastal BC which still have intact watersheds, has traced the importance of salmon carcasses to riparian vegetation (i.e. the massive spruce trees once found along Haida Gwaii streams) and all the little critters surrounding streams (eagles, ravens, martens, and even ground beetles). One of the most important individuals in this chain is the bear, as the amount of salmon carcasses and salmon waste they transfer from the stream to the surrounding environment is staggering.

Over a 45 day period in Bag Harbour (Gwaii Haanas) where approximately 5800 chum return, each bear transferred close to 700 salmon (1600 kg) of salmon from stream to forest. Within 2 metres of the stream, over 4000 kg of salmon biomass per hectare was identified. Just imagine a garden with this much fertilizer. Analysis of nitrogen isotopes (N15 - only found in marine environments) in riparian vegetation such as ferns, salmon berry, hemlock needles, found approximately 13% of nitrogen in plant tissue to be salmon derived. Analysis of growth rings in trees located near major spawning areas and trees located completely away from salmon areas, showed a direct correlation with years of increased spawners. For example, years of large chum runs correlated with growth spurts in the tree.

In other studies conducted in the United States (Bilby, Bisson, etc), N and C isotope tracing demonstrated up to 40% of N and C derived from eggs and carcasses of salmon were present in tissues of juvenile salmon. Significant amounts of marine N and C were also found in other fish, invertebrates, and riparian vegetation. In a comparison between one stream with carcasses deliberately added and one stream without, juvenile salmon showed increases in numbers, size and condition. Analysis of juvenile stomach contents while carcasses were present, demonstrated approximately 39% of contents was derived from eggs and carcass flesh.

Some scientists suggest that current salmon populations are 95% less than historical returns. What does this mean for an area such as Rennell Sound where the influx of chum carcasses has been reduced by approximately 92% in only four decades, in streams composed of 90% chum. What was the historical abundance in Rennell Sound? What are the long-term impacts on these streams losing over 90% of the marine derived nutrients they relied on for thousands of years?

Some hypothesize that the carrying capacity (the maximum population a given environment can sustain) of coastal old-growth forests and streams has been greatly reduced. If this is true, the diversity of fungi, invertebrates and vertebrates must be much lower. Many of the impacts on stream environments and surrounding ecosystems are yet to be seen. However, one of the impacts on vertebrates is quiet plainly visible. Ask a local commercial fishermen how much fishing they've done over the last few years.

There is no question that salmon populations have declined; the question is by how much? As fewer rotting carcasses are available for all critters we have a self-perpetuating cycle of lower and lower productivity in an ecosystem that includes, lest we forget; us.

References

Bilby, R.E., B.R. Fransen, and P.A. Bisson. 1996. Incorporation of nitrogen and carbon from spawning coho salmon into the trophic systems of small streams: evidence from stable isotopes. *Canadian Journal of Fisheries and Aquatic Sciences* 53

Bilby, R.E. *et al.* 1998. Response of juvenile coho salmon (*Onchorynchus kisutch*) and steelhead (*Onchorynchus kisutch*) to the addition of salmon carcasses to two streams in southwestern Washington, U.S.A.

Reimchen, T. and D.D. Mathewson. 1999. Salmon, bear, and nitrogen isotopes Linking ocean nutrients to forest ecosystems. An unpublished report.

