

Fred and Linda Hawkshaw Public Submission:

September 13, 2010

My wife and I are Area C commercial gill net fishers. If we hadn't chosen a different course as our gear of choice, we believe we would have had no idea about:

- (a) what potential our salmon really have; and
- (b) how best to bring those potentials out without the current risk to weak stocks and non-target species, aka by-catch.

Based on our experience in the fishery, we have a number of issues of concern that we feel aren't being addressed by DFO, the Pacific Salmon Commission or harvesters as they should be.

By-catch

DFO has recognised that in order to preserve weaker stocks, by-catch in commercial fisheries must be mitigated or minimised. The 2004 Southern Salmon Post-Season Review by the Honourable Bryan Williams identified the fishing gear impacts on Fraser sockeye and the cumulative effect of this gear as an area of concern regarding the preservation of these stocks (see http://www.google.ca/search?sourceid=navclient&ie=UTF-8&rlz=1T4ADFA_enCA372CA373&q=2004+Southern+Salmon+Post-SEason+Review).

Beginning in the very early 1990's DFO began asking for fisher buy-in on how to best mitigate or minimize current levels of by-catch kill. A few ideas popped up but nothing of any real substance so DFO turned instead to non-retention (meaning that it is illegal to have any fish onboard that is not part of the intended harvest) in the seine fishery and to "request" compliance in the gill net fisheries. It was held that the seine fishery should be capable of reducing its impact on non-target fish through improved net handling methods. For the seine fishery non-retention was a gift, means to avoid dealing with individual or majority non-compliance without anyone knowing any better.

To deal with the gill net fishery, DFO felt the best effort would be to encourage fisher compliance by giving them the right to retain dead non-target salmon and release any that were alive. For the gill net fishery, what occurred was just the opposite of what DFO wanted. Instead, of improving compliance, the majority of fishers chose to direct more and more effort on stocks DFO required for rebuilding. This was because as sockeye grew fewer, by default so too did earnings so we assume the majority felt they were justified in killing as many non-target salmon as they could because it was still legal to sell them under DFO's flawed "request" system.

The shame was, from prior experience with "request" in the seine fishery going back to the mid-1980's and need to release by-caught Chinook, DFO knew "requesting" anything would never fly in a fishery driven by mass volume. For example, DFO knew as far back as the 1970's that Nass Chum stocks were failing. In an effort to rebuild those stocks DFO had two choices: 1) ignore their plight; or 2) correct the problem through the fishery. DFO chose to try to correct the problem through the fishery. "Request compliance" was never going to work in the fishery as

long as enforcement was non-existent and decisions for all fishers were made by a majority of fishers.

Enforcement could do nothing because there is no policy to give enforcement the authority to hold individuals accountable when “request” is all that links moral guidance to compliance. To add fuel to this fire, DFO restructured the Advisory Board process such that only the majority of harvesters now have any say or control. With the majority holding total control (and the minority none) and no means to encourage progressive individual behaviour, the killing of non-target species to sell or avoid having to deal with them for live release soon became the best way to at least earn something for most fishers. Thus it was majority non-compliance then became the engine fuelling the fishery’s insatiable appetite.

It took my wife and I a couple of years to figure out we were never going to minimize the impact on non-target salmon as long as the conventional gill net remained in effect. By sheer fluke we discovered the 4" mesh net but it was to take more time before we finally understood that fish that appeared to be fine when caught in a typical gill net¹ would actually die a day or two later. This is because the conventional gill net uses mesh sizes intended to target median and larger fish (by species) and so the most common place for capture is behind the gill plate or operculum, thus the term “gill net”. Fish small enough to get further into the net end up clamped between the operculum and the dorsal fin. For these fish, exhaustion is the killer but for those fish caught by the gills, if the twine comes in contact with the filaments, or if the fishers fingers come in contact with the filaments trying to get the fish out, without realizing it the fisher has committed that fish to a slow but certain death. For fish headed for the can, there is no concern with this, but for those fish intended to be released, there is a serious problem.

The cause of the delayed mortality includes scale damage and or internal damage that can cause death or a failure to spawn, including a mucus-like substance that covers over the traumatized part of the filament (see attached photo and comment). Accordingly, that part dies but that's only the beginning of the problem as there is also an immune response that occurs which is fatal. In what appears to be an auto-immune response, this mucous-like substance progresses to other proximate areas eventually covers enough of the filament area that the fish suffocates to death and no one has any idea it went missing but the fisher and DFO will record it as being "live released". Also, studies done on the Columbia have shown conclusively that fish allowed to struggle for an excessive time body-clamped, will expend too much of their reserves and die later when no one knows (see the “WS WDFW Study” at <http://wdfw.wa.gov/publications/pub.php?id=00859>) so without correcting the problem we end up with a management system guessing at what survives after release and that surely can't be sustainable or responsible to the future of the resource or those who care about tomorrow?

We will see an increase in non-target kill going unaccounted with DFO's latest "effort" to force fishers to let everything they cannot keep go. I have to suspect DFO's rational will be to include a "number" to apply against a fishery to suggest when best to shut it down to avoid more mortalities. My question and concern is why would DFO not enable gear format changes with

¹ A typical, or conventional, gill net ranges from 4 ½ inches to 5 inches, the median size being around 4 ¾" to 4 7/8".

increased access? Because of the *Larocque v. Canada* decision in 2006, DFO cannot provide unequal benefit in a derby fishery. That's fine, because the derby fishery is being phased out anyway, just not fast enough to protect the rights of responsible fishers, aka the minority. Were quotas implemented, DFO could institute a policy enabling enforcement to do the job we pay them for and only individuals would be the victim of their own folly - failure to follow the rules. No longer would "majority" be an issue.

After finding my wife and my best efforts with the conventional gill net were never going to improve our ability to improve the kill on non-target fish, our last choice involved trying a smaller mesh net in order to attempt capturing all species by facial features in order to avoid gill filament damage and body/scale damage. With no apparent alternatives left, it was a huge relief to find it worked and worked very effectively. We chose a very fine twine in order to more effectively utilise the facial features or structure as capture and hold mechanisms. Such features would include the pre-operculum or false gill-plate and the type or lower jaw. The good news is that it is very effective. The bad news is that unless the fisher applies his/her best efforts at minimizing the length of time the net is in the water, coupled with as short a length net as economically viable, suffocation is a definite risk. However, on the plus side, provided the fish (net) are retrieved within 15-20 minutes, the risk of suffocation is minimal and the success of released fish is maximized for the long-term. This data is available on the Washington State Department of Fish and Wildlife website from the studies done on the tangle-net on the Columbia River (see e.g. the US WDFW Study).

The simple act of putting a non-target fish over the side does not ensure it will spawn. Although it is unknown why some fish can't spawn, regardless of the cause for pre-spawning mortality, we should choose to do the best we can to give every fish we encounter or handle its best chance to spawn. In the short-term the solution lies in using a gear format that minimizes the physical trauma imposed through larger mesh sizes and minimizing the length of time any fish spend in the net. The longer they can struggle in the net, the fewer reserves they will have to survive the long journey upriver to the spawning grounds. The US WDFW Study defines the difference the right mesh size can make and the impact the wrong mesh size imposes. DFO's only recourse when the wrong mesh sizes are allowed is to cut the fishery short on access to healthy target stocks.

For more information on this issue, please also see:

1. Tooth Tangle Net Report 2001 (attached).
2. Tangle Net Report 2002 (attached).
3. Our submissions to DFO in 2005 regarding the *Wild Salmon Policy* and its strategies (attached).
4. Baker and Schindler 2009 paper discussing unaccounted mortality in salmon fisheries and non-retention in gill nets and the effects of this on the estimates of spawners (attached).
5. Letter from Minister of Fisheries and Oceans regarding live-harvest processing (attached).

Three other serious and related issues of concern:

Majority rules and DOF advisory processes

The way the Advisory Board system for commercial harvesters is set up, only the majority have any say or input with respect to the fishery. Anything expressed by the minority carries no weight at all. As long as the advisory system remains controlled by this majority, neither responsible nor sustainable fishing can occur and the result will be either no fishery or a fishery so diminished it will become non-viable.

DFO must manage all stocks of BC salmon and Steelhead as sustainable units, regardless of how that appears to industry. In the past, weak or seemingly insignificant stocks would have fallen victim to extirpation or even extinction. To avoid repeating the past, DFO now has no choice but to manage all fisheries in a manner that encourages fisher buy-in or what is referred to as “compliance”. But, as it is today and has been for far too many years, the majority of fishers in the commercial net fisheries have rejected the need to protect weak stocks requiring cautious management for species such as Steelhead which are managed as a priority for other user groups with the direct result that DFO has had to reduce access to strong stocks and species and this really only punishes the compliant because in response to majority non-compliance DFO cuts access to the fishery regardless of the strength of the target species return.

Sadly, this year DFO chose to once again continue the practice of rewarding non-compliance because of the size of the Fraser returns. What occurred this year and in past is, because DFO refuses to apply punishment for non-compliance with respect to by-catch of weak and non-target salmon, Area Licensing has become a tool for non-compliant fishers to benefit from their behaviour with zero accountability.

DFO has broken the coast into a number of Areas, each requiring a different license to fish. Many fishers have chosen to buy or lease alternate areas, presumably as a means to improving their access in the event one area fails and another might pick up the losses. In concept such an idea should have been credible but unfortunately it hasn't worked out as planned. For some there is merit to owning or leasing access to other areas but in this case, DFO has made no provision for stopping majority non-compliance from also moving from one area to another.

In the seine fishery DFO enforced non-retention of any non-target species. The bad news is, there is no way for anyone to know how many non-target fish are killed. The only consolation is, no fish from stocks or species DFO is concerned with can be sold. For the gill net fishery, because it is not possible for the conventional gill net format to avoid killing non-target species to any acceptable degree, DFO used to allow the sale of such fish, requesting live ones be released. Because the majority refused to comply with DFO's request, DFO now is enforcing the same regime on the gill net fishery as they do with the seines but such management decisions are doing nothing to help rebuild weak stocks or avoid the impact such irresponsible actions impose on other user groups. The only solution is to move all net fisheries to IVQ (Individual Vessel Quota) whereby individual controls can be dealt with by enforcement.

To date DFO refuses to deal with this issue because it is DFO who has made the Advisory Board process the exclusive control of this non-compliant majority and the minority has no say or rights as a result.

At some point, DFO is going to have to choose to ignore non-compliance or apply enforcement only on those who refuse to stop killing non-target salmon and steelhead, otherwise known as by-catch. Unless DFO is willing to respect the rights and concerns of responsible fishers, as it is now not even the Canadian Public has any rights that can supersede the power DFO has given to its Advisory Board process and the unnecessary killing of weak salmon stocks and non-target species will go on regardless what Canadians expect.

Given that currently we are ruled by an autocratic Advisory Process whereby only majority control and input is accepted by DFO, and that same majority is the cause of unacceptable non-target fish kill, in the future any information provided by DFO to the Advisory Boards should also be passed out directly to individual licensed fishers. This would include any response or advice from the Advisory process to DFO. Commercial fishing is a business and no business can be operated effectively without all the available information being readily available and accessible. As it is works now providing input to the Advisory Board process is no different than trying to fill a tub with a bottomless bucket- anything that doesn't suit or fit with the demands of the majority is rejected or disregarded.

The best means to correcting majority interference in individual rights and choices is to implement Individual quotas or shares. This would make each license holder responsible for his/her own actions and behavior and provide DFO Enforcement with the means to pro-actively deal with those choosing to disregard the rules or management requests for compliance with fish regarded by management as being not for harvest, or aka- non-target.

For more information on this issue and related social issues, please see:

1. *Enclosing the Fisheries: People, Places and Power* (www.afsbooks.org/54068P), which is a book about the effects of restricted access management in fisheries on people and their communities.
2. Studies regarding the small-scale versus large scale fisheries (<http://www.publicaffairs.ubc.ca/media/releases/2008/mr-08-109.html>; <http://www.seaaroundus.org/News.htm>).
3. A Modern and Effective Fisheries Management Compliance Regime (<http://www.dfo-mpo.gc.ca/media/back-fiche/2006/hq-ac46d-eng.htm>).
4. Our submissions to DFO in 2005 regarding the *Wild Salmon Policy* and its strategies (attached).
5. Correspondence between us and DFO relating to non-retention and non-compliance in the chum and Skeena sockeye fisheries (attached).
6. E-mail from us to DFO's Regional Director General for the Pacific Region, Sue Farlinger, regarding modifications to the seine fishing opening this August because of concerns about poor compliance with fishery rules (attached).

Alaskan interception

In the last two years Alaskan net fisheries have taken more BC sockeye than all BC fisheries and this is not only unjust but irresponsible with respect to the rights of Canadians and Canadian fisheries. Much concern is being made about failing BC salmon stocks, and more recently, sockeye stocks. Without correcting the flaws built into the *Pacific Salmon Treaty*, as was done for Washington State Chinook in 2009, North Coast BC sockeye stocks and our North Coast net fisheries could conceivably continue to decline until they all go extinct, not just Smith's and River's Inlet sockeye stocks as it is now. The flaws as we see it are an apparent lack of credibly applied or pro-active risk management on North Coast weak, endangered or threatened salmon (Coho and sockeye) stocks.

In 2009, changes were made to the *Pacific Salmon Treaty* to provide compensation to the BC fishing industry in exchange for a significant reduction in the Chinook harvest under the Treaty (<http://www.cbc.ca/canada/british-columbia/story/2009/01/06/bc-us-salmon-treaty.html>). As a result, Washington State is providing \$30,000,000 to help buy out BC Trollers and minimize the hurt done because these fishers are no longer able to fish as they had in past. A small amount of money was also put up to buy out a few Alaskan seines and it was also agreed to stop sending packers out to Noyes Island to discourage their seines from fishing out there and intercepting Fraser etc, sockeye stocks. The problem now is, there are still too many Alaskan seines and we have cause to believe these seines are now directing greater effort at Northern sockeye stocks which is imposing severe hardship on our North Coast communities and sockeye fisheries..

There are data that provide an estimate of the approximate Alaskan interception of our sockeye: The total salmon catch estimates to date in Alaskan Districts 101-104 by gillnet and seine are approximately: 3,300 Chinook, 236,000 sockeye, 195,000 Coho, 8,848,000 pink and 901,000 chum salmon. Of the total in-season sockeye catch reported, approximately 62,000 (26%) are estimated as Nass origin based on mean stock composition estimates from 1982 to 2007. Source of Alaskan commercial catch information is from the Alaskan Department of Fish and Game (ADFG) website (<http://skeenafisheriesblog.blogspot.com/2010/08/nass-update-to-aug23rd2010.html>). The other 74% of intercepted sockeye remain of unknown origin although we know they are from systems in BC. While it is important to the Nisga'a to know how many Nass sockeye Alaskans take, to the rest of us it is essential that we know exactly how many sockeye are also taken from Smith's Inlet, River's Inlet and the Skeena River each year by Alaskan net fisheries. Neither the Pacific Salmon Commission nor DFO has provided any data regarding what is preventing these once extremely valuable sockeye runs to fail and that is unacceptable. In fact, DFO stated at a public meeting last year that it is entirely possible that the Smith's Inlet sockeye could go extinct (this statement was made at a *Wild Salmon Policy* meeting in Terrace in 2009 that I attended). This is unacceptable and there are solutions but they involve changes in both the management of the net fisheries here in BC and in Alaska. The Pacific Salmon Commission managed to deal with BC interception of US endangered Chinook stocks and must now correct Alaskan interception of North Coast endangered sockeye stock.

There are two things that tie Smith's Inlet sockeye to Alaskan interception our sockeye are all considered by-catch in the Alaskan fishery, but there is no explanation as to why only North Coast sockeye stocks are failing to return as predicted and why BC fisheries are not getting

what the Treaty says will be equal shares of these fish. Both DFO and Alaska know where and when Smith's and River's Inlet sockeye can be intercepted but even having said that, until the PSC conducts a full study on where all interceptions occur throughout Alaskan fisheries, starting in the Bering Sea and on down the coast, the PSC is not respecting North Coast salmon stocks and fisheries as they should be. Size-selective fishing: practices and gear formats

Salmon are exposed to a variety of fishing gears and intensities as immature or maturing individuals. Some studies have evaluated the evidence that fishing is causing evolutionary changes to the life history traits of salmon including body size, migration timing and age of maturation. Please see:

1. Work by Professor Ricker regarding the effect of fishing on Pacific salmon size (http://books.google.ca/books?hl=en&id=3K9KAocMn0EC&dq=Pacific+salmon+%26+their+ecosystems+:+status+and+future+options&printsec=frontcover&source=web&ots=OLr72y1HcJ&sig=PRBoBfYAqLqNi7DM0DosUhS5kw8&sa=X&oi=book_result&resnum=1&ct=result#PPA228,M1).
2. Paper by Hard et al. 2008 on evolutionary consequences of fishing and their implications for salmon) (attached).
3. Study by the UN Food and Agriculture Organization, Fisheries and Aquaculture Department regarding the selective effects of fishing (<http://www.fao.org/docrep/003/V4865E/V4865E05.htm>).
4. Summary of Darwinian fishery science being researched by the Conover Fish Ecology Lab which is part of the Marine Science Research Center of Stony Brook University (<http://www.somas.stonybrook.edu/~conover/index.html>).

My wife and I believe that there are implications for fisheries and conservation related to size-selective fishing for fishery management (see for example paper by Schroder et al. 2008 on size-class specific biomass increases with mortality: <http://www.pnas.org/content/106/8/2671.abstract?ct>). Being career fishers whose career has been abruptly brought to a halt by the collapse of our salmon and fishery has done nothing to stop our drive to better understand why our salmon have collapsed and what must be done to turn this mess around. It may already be too late for people like my wife and I to hope there's still a future in our salmon fishery depending on the severity of the genetic degradation, but it is never too late to at least try and be part of the solution, something we've always strived to do.

From the science that is accumulating on this issue, it is irresponsible for DFO to ignore this issue any longer and it should take steps to look at the possible implications for fishery management of size-selective fishing. We believe DFO has two options, one of which would be unacceptable for our fishery dependent communities. The "simple" option is to reduce the harvest to such a point there is no risk of a shortfall in the strongest genetics contributing to the spawn, aka survival of the fittest. The other option, in order to keep our north coast fishery viable and sustainable involves dealing with the known contributors to size-selective impact.

Certain factors we may have no control over but others we do and those would include re-formatting the maximum mesh size and hang-ratio as it applies to the conventional gill net. From our work with a smaller than normal gill net mesh we've learned our average weights range around 3.9 to 4.2 pounds round per sockeye. For the regular fleet using a conventional mesh gill net, the average round weight would be 5.2 pounds. We fish in exactly the same areas and times as the regular fleet. In the upriver fisheries, the average round weight is 4.2 pounds,

slightly higher than our average weights but considerably smaller than the regular gill net fishery. From this we suggest because of our net's mesh size and hang-ratio (amount of web hung on the cork-line) by default more of the larger fish don't get caught in our net, providing better opportunity for the stronger genes to maintain the stocks ability to adapt successfully to changes in the salmon's environment. We assume the upriver fisheries lower weights are a result of the regular gill net fishery removing too many of the larger sockeye.

We are of the opinion, based on the science supporting our concerns on this issue that industry also has two options: either accept a severely reduced fishery or accept such simple changes that minimize the risks to the fish from a genetic perspective, minimize the risks to non-target species and weak stocks by using a gear format that when used responsibly ensures minimal harm and risk to species that must be released with the least harm and best chance at long-term survival including spawning success.

Sincerely, Fred and Linda Hawkshaw, Terrace, BC