The Evolution of Recreational Salmon Fisheries in British Columbia

Report to the Pacific Fisheries Resource Conservation Council

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EXECUTIVE SUMMARY

The recreational fishery for salmon plays an important role in the social and economic life of British Columbia. The five species of salmon, but particularly chinook and coho, are the primary drivers in activities that directly involve several hundred thousand British Columbians of all ages and backgrounds as well as visitors from other parts of the country and all over the world.

Without effective conservation of salmon, and protection of both freshwater and ocean ecosystems, the opportunity to fish and the expectation of catch which drive the recreational fishery would cease to exist. The long term sustainability of both the fish and the fishery are inextricably linked.

For many years, recreational salmon fishing in British Columbia was largely unregulated. There was no daily bag limit until 1951. Until 1981, no license was required and no catch statistics were collected. Government regulators considered the recreational harvest inconsequential.

Although total harvest numbers were small compared with commercial catches, competition between the sectors became evident in the 1960s. Recreational anglers began to organize to protect their interests and government channeled this activity into a Sport Fishing Advisory Board (SFAB). "Opportunity and Expectation" became the sector's mantra and "Priority Access" its political objective through a succession of consultative exercises that started with the Royal Commission on Pacific Fisheries headed by Dr. Peter Pearse in 1982, progressed through a "visioning" exercise with the provincial government, involved several economic value studies and the appointment of separate advisory processes under Art May and Samuel Toy, and ended with the federal government's "New Directions" policy announcement on salmon allocation in 1999.

The 1999 announcement made clear that after conservation needs had been met, and constitutional harvest obligations to First Nations addressed, recreational anglers would have "priority to directed fisheries on chinook and coho salmon" and "predictable and stable fishing opportunities for sockeye, pink and chum salmon".

The federal government's recreational advisory process has an obligation to give majority representation to ordinary anglers as opposed to the many people with an economic interest in sport fishing. The advisory process is important because recreational salmon fishing is an activity involving several hundred thousand individual license holders. While the overall recreational share of the total salmon catch is small, at 3%, anglers catch larger proportions of chinook (35%) and coho (30%) and recreational fishing accounts for 40% of the total economic contribution of British Columbia's fishing and aquaculture sector.

There are a number of recreational salmon fishing issues with implications for conservation. A shift in fishing effort from Georgia Strait to the west coast of Vancouver Island and northern British Columbia places greater reliance on mixed stocks with implications not only for smaller and weaker runs but also for Canada's commitment to abundance-based and total mortality management under the Pacific Salmon Treaty.

Issues with potential conservation implications also arise from the interface between the recreational and commercial sectors. An example is the need to define more clearly the abundance levels which trigger directed commercial fisheries on chinook and coho.

As in other sectors, there is an inevitable tension between the desire of those who profit from recreational fishing to ensure immediate economic value and their longer term commitment to conservation. Issues related to the marginal utility of alternative conservation measures are hotly debated within the recreational advisory process with the objective of designing measures that meet conservation needs while also providing fishing opportunities.

Against this background, the SFAB has become directly involved in helping the Department of Fisheries and Oceans (DFO) implement new government policy that requires each sector to cover the costs of catch monitoring and to become involved in co-management of the fisheries resource. Acceptance of this role presents a significant challenge to an advisory process composed of unpaid volunteers.

The government policy of priority access to chinook and coho salmon means conservation measures inevitably have their first impact on the commercial sector. This said anglers have to recognize that much of their activity takes place in areas and at times when stocks are mixed and their fishery can have an adverse impact on small and weak runs. Especially in the context of the Wild Salmon Policy and the Species at Risk Act, recreational anglers and their representatives have to help ensure that their impact on the resource is adequately measured and that it is not undermining future expectation and opportunity by an unsustainable impact on any salmon stock.

1. INTRODUCTION

The recreational fishery for salmon plays an important role in the social and economic life of British Columbia. The five species of salmon, but particularly chinook and coho, are the primary drivers in a recreational activity that directly involves several hundred thousand British Columbians of all ages and backgrounds as well as visitors from other parts of the country and all over the world. This quest for salmon is an important part of British Columbia's culture and prompts economic activity worth hundreds of millions of dollars.

The long term sustainability of both the fish and the fishery are inextricably linked. Without effective conservation of salmon, and protection of both freshwater and ocean ecosystems, the opportunity to fish and the expectation of catch which drive the recreational fishery would cease to exist.

Responsibility both for the conservation of salmon and regulation of salmon fishers ultimately rests with government, and particularly the Government of Canada which is charged under Section 91 (12) of the constitution with responsibility for "Inland and Sea Coast Fisheries".

2. About Pacific Salmon[1]

Lifecycle

The five commercially exploited species of Pacific salmon—sockeye, pink, chum, coho, and chinook—originate in hundreds of British Columbia river systems, migrate to sea to spend their adult lives, and return to their freshwater point of origin to spawn. Fundamental to continuation of the lifecycle are an adequate number of adult spawners, suitable spawning grounds, hospitable freshwater conditions for rearing and the outbound and homeward passages, and an amenable ocean environment (presence of feed, suitable water temperature, currents, and so on). The number of distinct stocks or "races" of salmon is estimated to be greater than 8,000.

The Influence of Ocean Conditions

Scientists are increasingly aware that ocean conditions (temperature, currents, feed) exert a strong influence on salmon survival and productivity. In the past, the prevailing notion was that salmon abundance was proportional to the number of spawners. Today we know that the same level of spawners can produce widely variable returns, depending on ocean conditions. For example, in the late 1980s, the survival rates (the percentage of juvenile salmon returning as adults) for southern BC coho stocks were approximately 10–15%, and runs were healthy. By the late 1990s, the survival rate was 1% or lower and dangerously low returns necessitated stock conservation measures. Insofar as we know at present, this phenomenon was unrelated to the influence of man.

Competing Demands for Salmon

While fishing may impose the greatest direct human impact upon Pacific salmon abundance, it is by no means the only human influence. There is a wide and obvious range of competing demands for the salmon resource. As pointed out in the excellent poster prepared by Ecotrust's "Salmon Nation", there is the need of the fish themselves for spawning returns sufficient to perpetuate their species or stock and ensure its genetic diversity. Paralleling this need is the dependence of a myriad of other organisms on the decaying carcasses of dead salmon.

[1] This section has been based on the corresponding chapter in the PFRCC paper by Stuart Nelson and Bruce Thomas describing the evolution of the commercial salmon fishery in British Columbia.

Salmon Nation Poster (excerpt) "137 Species Depend on Salmon" [2]

After spawning, they leave their nutrient-rich carcasses behind. Many of the microscopic creatures that nibble on the carcasses eventually become prey for the next generation of fish. And so the parents nourish the young.

But salmon provide more than an indirect food source for baby salmon. At least 137 different species—from grizzly bears to gray wolves—depend on salmon for part of their diet. Even trees and plants benefit from the nutrients brought back by salmon from the seas.

There is what might best be termed as "natural harvest", the salmon eaten by killer whales, sea lions, seals and other predators. There is the easier to quantify human harvest by First Nations, recreational anglers, and commercial fishers and there is the important non-consumptive need for salmon. People want to know that this incredible natural cycle is continuing—as evidenced by the thousands who each year travel to locations where they can watch salmon returning to their spawning grounds.

In many respects, the salmon resource is now "over-subscribed", meaning that the wishes of all users are greater than the available resource. This should not be surprising when one considers the simple ratio between human population growth and salmon production. In 1978, Philip Meyer pointed out in a study of recreational resources for the provincial and federal governments that while the average total escapement of all species of salmon had remained relatively stable between 1940 and 1975, the estimated escapement per capita had declined from 11.5 to 3.5. In other words, population growth had greatly outstripped salmon production.[3]

Since 1975, the provincial population has increased by 70% while abundance has declined. The resulting disputes between harvesters over allocation have prompted major policy changes on the part of DFO as it has attempted to reconcile both competing demands and conservation needs.

[2] Ed Hunt, "137 Species Depend on Salmon", Salmon Nation, Ecotrust, http://www.salmonnation.com/fish/137_species.html.
[3] Philip A. Meyer, *A Study of Satisfaction and Substitutability in Recreation Available to Residents of Urban British Columbia*, Government of Canada, Ministry of Fisheries and the Environment, Province of B.C., Ministry of Recreation and Conservation, 1978

3. Growth and Development of the Recreational Fishery

Early History: Unregulated and Ignored

Recreational fishing has a venerable history in British Columbia. Accounts of the excitement of catching salmon abound in the province's early history. In what might be one of BC's earliest recorded "fish stories", the Honourable Roderick Finlayson confided to his diary in the summer of 1845 the experience of a visitor to Victoria from Scotland. John Gordon, captain of the British frigate HMS America "was preparing his rod to fish for salmon with the fly, when I told him the salmon would not take the fly but were fished with bait. I then prepared tackle with bait for him and he went in a boat to the mouth of the harbour, where he caught several fine salmon with the bait. His exclamation on his return was, 'What a country, where the salmon will not take the fly'".[4]

While this anecdote serves to highlight the historic place of sport fishing, we must add that then, as now, it was not easy to distinguish between recreational and food fishing. In his diary, Finlayson talks about the "large, fine salmon" that was placed before his guests, "smoking hot" at breakfast the next morning. Many people are attracted to fishing as a hobby because it combines recreational benefits and a means to supplement their personal food supply. Perhaps like vegetable gardening, it helps to satisfy some primitive urge left over from our history as "hunter-gatherers".

For more than a century after these early origins, individuals were allowed unrestricted access in tidal waters to fish for personal use. Recreational fishing for salmon was largely unregulated and no effort was made to collect catch statistics. The first formal restriction on sport fishing in tidal waters came in 1951 with the introduction of a daily bag limit of ten salmon and a minimum size limit of eight inches. Daily possession was reduced to eight in 1959 and four in 1963, when the size limit was increased to twelve inches.

The sense that the recreational harvest was inconsequential and needed little regulation or measurement began to change as growth in both participation and harvest put the sector into direct competition with some commercial fisheries. The need to gather statistics became obvious as did the responsibility to grapple with intersectoral allocation and to reduce pressure on heavily targeted stocks.

1981 saw a new and much more rigorous approach to the regulation of sport fishing. Not only was a license requirement put in place after 10 years of debate but a number of other measures were introduced in an effort to reduce recreational fishing pressure on specific stocks of chinook. The minimum size limit was changed to 18 inches and the daily bag limit for this species reduced to two. A winter chinook closure was announced, along with a ban on chinook fishing in the Fraser River and a ban on the use of downriggers by recreational anglers.

The latter three measures provoked a storm of protest from the angling community. The Sport Fishing Advisory Board proposed a set of seven alternatives and eventually this was accepted by the department, setting the stage both for today's complex regulatory regime and for continuing tension between competing views of how best to achieve conservation.

[4] John Walbran, *BC Coast Names: 1592–1906,* Ottawa, Government Printing Bureau, 1909, p. 210.

Opportunity and Expectation

The development of direct competition for salmon between the recreational and commercial sectors and recognition that the growing sport harvest reflected substantial new investment in the facilitation of recreational fishing opportunities created a set of policy challenges for the federal fisheries department. These issues surfaced first in Victoria in the early 1960s, where an active sport fishing community organized in reaction to the impact on recreational opportunity of a rapidly growing commercial seine fishery. While the target species were sockeye and pink salmon, the seine nets had an incidental impact on chinook and coho as Canada competed with the United States for access to salmon returning to the Fraser by "leapfrogging" the US fleet and fishing intensively further out Juan de Fuca Strait.

Led by Bob Wright, then in the early stages of creating what would eventually become North America's largest sport fishing business, the Oak Bay Marine Group, Victoria anglers succeeded in getting their area closed to commercial harvest.

From these beginnings grew the repeated assertions of the recreational sector that the economic and social success of sport fishing depended on "opportunity and expectation". Anglers needed the opportunity to go fishing with the expectation that they might catch (and keep) something. "Opportunity and Expectation" became the sector's mantra.

In the case of salmon fishing, it was argued that opportunity and expectation could only be guaranteed by priority access to chinook and coho.

The Pearse Royal Commission

The notion of priority access to chinook and coho was given a direct boost by the 1982 Royal Commission. A brief to Pearse from the Sport Fishing Institute argued that "recent technological and social changes dictate the need to ask some fundamental questions about the most beneficial ways to harvest the different salmonid species, taking into account the need to perpetuate the resource, its recreational value, and the cost effectiveness of present methods of commercial exploitation".[5] The brief complained that mixed stock net fisheries were causing "serious conservation and management problems" because of their "substantial incidental catch of both mature and immature chinook, coho and steelhead".

Pearse responded positively, noting that "sport fishing depends mainly on chinook and coho salmon", that attempts to catch these fish had led to the development of a recreational fishing fleet whose capital value "is now about the same as the value of the commercial fleet" and that against this background "maximizing the economic and social benefits from our fish resources calls for allocating the available catch between the sport fishery and other fisheries in proportions that will generate the greatest value". He urged DFO to "intensify efforts to reduce the commercial fisheries' catch of the vulnerable chinook and coho stocks".[6]

The Pearse recommendations led to a stronger recreational focus in DFO during the 1980s. On the West Coast, a recreational fisheries division was created and given responsibility to improve recreational catch and effort data by means of a creel survey in Georgia Strait. In co-operation with the provincial government, an attempt was made to develop a Pacific Region "Recreational Fisheries Vision 2000". The results of this effort never received formal ratification because the "Vision" process was overtaken by other developments more closely related to the practical issues of salmon allocation between the recreational and commercial sectors. Growing competition forced government to initiate a series of specific enquiries aimed at trying to find some resolution.

[5] Sport Fishing Institute of BC, Brief to Pearse Royal Commission, manuscript in possession of Gerald Kristianson.
[6] Peter H. Pearse, Ibid, p. 197.

The ARA Economic Value Study

In 1995, the federal and provincial governments jointly sponsored a study of the relative economic value of chinook and coho salmon to the commercial and recreational sectors. This report was presented in February 1996. It concluded that:

- "The recreational fishery generates more aggregate expenditures, value and impacts with a lower harvest of salmon".
- "The value of an extra [chinook or coho] salmon is worth more in the hands of a recreational fisherman than commercial fisherman".
- "The benefits from angling are more broad-based than those in the commercial fishery".[7]

"Altering Course": The Art May Enquiry

With the final version of the ARA study nearly in hand, in January 1996 the Minister of Fisheries and Oceans appointed Dr. Art May, a former Deputy Minister, as an independent advisor to recommend initial allocation shares for each sector (including First Nations) and a process for future adjustments in shares between sectors.

May's December 1996 report concluded that "There is no possibility of building consensus among all interested parties on principles or policy frameworks to guide the conservation and utilization of Canada's Pacific salmon fisheries".[8] While he recommended that "Initial shares for each of the commercial and recreational sectors should be based on the most recent historical period which provides for greatest fairness to the greatest number of participants", he added that "the recreational fisheries should take priority in allocations over directed commercial fisheries for chinook and coho at times of low abundance, conditional on the losses incurred by commercial license holders in any allocation transfer being compensated by revenues raised in the recreational sector".

The Toy Process

The lack of any intersectoral consensus around May's recommendations led, in turn, to the appointment by the federal and provincial governments of another independent advisor in October 1997. Former judge Samuel Toy was given instructions to review May's work and consult with the fishing sectors in an effort to find consensus "on as many issues as possible". Toy appointed an advisory committee of representatives from the recreational and commercial sectors and First Nations. While the latter group subsequently withdrew from the process the commercial and recreational representatives continued to talk, with the incentive from Toy that "if you don't come up with recommendations for me you will have to live with what I decide".[9] The result was several months of arduous discussion leading to a document entitled *Managing Change: Principles and Mechanisms for Intersectoral Allocation* in which both sides agreed to a statement of principles aimed at resolving longstanding arguments over salmon allocation. The full text of this document can be found as Appendix 8 to Toy's report.

Both parties agreed that any fair and reasonable process for handling intersectoral allocation "must reflect the differing needs, characteristics and business attributes of the two sectors, each of which contributes in its own way to the lifestyles and economy of BC". This meant, in the case of the recreational fishery, "the need to sustain "opportunity and expectation through a year-round

[7] ARA Consulting Group Inc, *The Economic Value of Salmon*, February, 1996, pp. xi-xii.
[8] A.W. May, *Altering Course*, Memorial University, December 1996, p. ix.
[9] Samuel Toy, *Recommendations for Policy Changes Implementing Several Recommendations of Dr. A.W. May's Report "Altering Course" on Intersectoral Allocations of Salmon in British Columbia*, Department of Fisheries and Oceans, March 16, 1998.

fishery based on reasonable and sustainable limits", and in the case of the commercial sector, giving effect to earlier government commitments "with respect to certainty of access…a neutral impact on the commercial allocation process…and assuring that the commercial sector has the opportunity to harvest available surpluses." Reasonable and sustainable limits were defined as 2 per day and four in possession for chinook and "4 and 8" for coho.

While a number of the principles in the document focused on the issue of compensation to the commercial sector for allocation changes and are not directly relevant to this study, the first two provided a substantive basis for subsequent decisions by DFO.

- The recreational fishery should be managed based on the application of reasonable limits on an annual basis, with local closures and other restrictions utilized to deal with specific conservation needs. The recreational "allocation" will not be a fixed number, calculated pre-season, but the department's estimate of the total catch to be derived from the application of the chosen limits.
- In years of lower abundance it may be necessary to reduce the allocation of chinook and coho targeted by the commercial sector in order to ensure that the recreational sector is "last on the water". However, in these years the commercial sector would continue to receive minimum allocations of these species as bycatch mortalities in order to maintain fisheries on other target species.

Toy issued his report on March 16, 1998, and true to his earlier promise and threat recommended implementation of the recreational/commercial agreement, subject to some "observations and qualifications" that did not apply to the principles outlined above.

The Millennium Plan

At the same time, the Sport Fishing Institute (SFI), representing the many businesses whose success depends on a vibrant recreational fishery, published and gave wide circulation to its *Salmon Management Plan for the New Millennium*. This glossy document urged government to end mixed stock commercial fishing by ensuring that in future this harvest would only take place "when healthy runs can be identified and targeted" Supported by full colour graphics illustrating the location of "choke-point" mixed stock fisheries in Juan de Fuca and Johnstone Straits, it said that "Fishing plans must be developed and approved which take into account the imperative need to allow weaker stocks, particularly chinook, coho and steelhead, to return in adequate numbers to smaller rivers and streams".[10] It did not discuss whether recreational mixed stock fishing posed similar issues, apparently assuming that the smaller size of the harvest reduced the risk.

New Directions

Faced with sectoral pressure as well as Toy's new advice, officials in the Department of Fisheries and Oceans produced a "blue paper" draft policy document, *An allocation Framework for Pacific Salmon, 1999–2005* in December 1998. Following circulation of the draft document, the department retained the services of consultants, Edwin Blewitt and Associates and Timothy Taylor and Associates, to facilitate a series of workshops at which various stakeholders could be heard and to review and report on over 225 pages of written submissions. Blewitt and Taylor completed their report in April 1999.[11] The department then proceeded to issue a final "New Directions" allocation policy paper in October 1999 and to implement the policies laid out in this document.

[10] Sport Fishing Institute of BC, *A Salmon Management Plan for the New Millennium*, April 1998, p. 2.
[11] Edwin Blewitt and Timothy Taylor, *An Allocation Framework for Pacific Salmon: 1999–2005*, Report on Written Submissions and Workshop Discussions, April 1999. Text can be found at: http://www-comm.pac.dfo-mpo.gc.ca/publications/BlewettReport_e.PDF.

The 1999 paper says that:

> "Recreational and commercial salmon fisheries operate very differently. The recreational fishery accounts for a relatively small portion of the total annual harvest of salmon. It is primarily concerned with the quality of the angling experience and the opportunity to fish throughout the year. In contrast, the commercial fishery, which takes place mainly from July to November, accounts for the vast majority of the total salmon harvest and is primarily concerned with the quantity and value of the catch."[12]

It summarizes average catch shares and compares the economic contributions of the two sectors, quoting the 1996 ARA study as concluding that "although both fisheries would clearly receive additional value from having more chinook or coho allocated to them, the value of an extra chinook or coho salmon is greater to the recreational than the commercial fishery". It says that "the recreational fishing on these two species generates more economic revenues, value and other economic impacts with a lower harvest of salmon than the commercial sector".

These benefits are cited to justify Allocation Principle 4, which states that:

> After conservation needs are met, and priority access for First Nations…is addressed, recreational anglers will be provided:
>
> - Priority to directed fisheries on chinook and coho salmon; and
> - Predictable and stable fishing opportunities for sockeye, pink and chum salmon.

With respect to chinook and coho, the paper defines "priority access" as meaning that:

"Where conservation goals cannot be met, recreational fisheries for all salmon will be closed. Where abundance is sufficient to meet conservation goals but insufficient to address First Nations needs, recreational access will be restricted to selective fishing only including non-retention of chinook and/or coho salmon as appropriate. Where abundance is greater, directed recreational fisheries will be permitted, however, the recreational limits for these fisheries will be determined by relative abundance. Even in high abundance scenarios, recreational limits will not exceed 2 per day with a possession limit of 4 for chinook salmon and 4 per day with a possession limit of 8 for coho salmon (e.g., in terminal areas or harvest of hatchery-produced salmon)."

Allocation Principle 5 deals with commercial harvest and states that "the commercial harvest of chinook and coho will occur when abundance permits". It says this means that these species will be available to directed commercial fisheries when harvestable surpluses are large enough to "allow for a directed recreational fishery based on limits of 2 per day and 4 in possession for chinook and 4 per day and 8 in possession for coho".

The "predictable and stable fishing opportunities for sockeye, pink and chum are to take place on "a maximum annual average of 5% of the total combined recreational and commercial harvest on a coast-wide basis over the period 1999 to 2005". "Appropriate daily and annual catch limits and other controls" were to be put in place to "ensure that fishing time and opportunity to fish are protected while avoiding unnecessary adverse impacts on the commercial sector".

One other aspect of these allocation policies needs to be spelled out in detail. The two sectors had agreed during the Toy process that in years of low chinook and coho abundance "the commercial sector would continue to receive minimum allocations of these species as bycatch mortalities in order to maintain fisheries on other target species". The second allocation policy paper adopts this principle, saying "When harvestable surpluses are lower, some chinook and coho may be caught

[12] Fisheries and Oceans Canada, *An Allocation Policy for Pacific Salmon*, October 1999, p. 20.

by commercial fisheries on a non-retention basis to allow them to prosecute their directed fisheries on other salmon species". It is important to understand that this principle means, in effect, that there may be times when recreational sector access to chinook and coho is closed, because the commercial sector needs all of the available mortalities (on a non-retention basis) in order to harvest sockeye, pink and chum.

Having adopted this new salmon allocation policy in October 1999, the department followed up at the national level by articulating priority access as a guiding principle for recreational fisheries. A national "Operational Policy" announced in 2001 said that "Further consideration will be given to increased or priority access for recreational use under the concept of "best use" of the resource, after obligations to First Nations are met".[13] This statement seems to firmly place recreational fishing second in priority after First Nations but ahead of commercial exploitation.

[13] Fisheries and Oceans Canada, *Recreational Fisheries in Canada—An Operational Policy Framework,* 2001, p. 5.

4. THE CURRENT REGULATORY AND ADVISORY REGIME FOR SPORTFISHING

Rules in the Guide

The current recreational fishing regulations are summarized in the *2005–2007 British Columbia Tidal Waters Sport Fishing Guide*. A "Freshwater Salmon Supplement" is included in the same booklet. This handbook used to appear annually but efforts have been made to reduce the frequency of publication both for cost reasons and because the regulations have become so complex and time sensitive that important parts of any handbook inevitably are outdated almost immediately after publication.

The growing complexity of conservation measures and the efforts to integrate fishing plans for all three harvest sectors has led to a situation in which each year's detailed requirements often are not known until well into the recreational season. This means that key parts of the regulations are not available for a publication which comes out in advance of the season. This has created a very unsatisfactory situation. It is difficult for recreational anglers to know with certainty the rules that apply at any time in any location. This not only can mean lost fishing opportunity but also can mean that anglers are not aware when conservation measures have been imposed.

The published sport fishing guide continues to be helpful as a general guide and educational tool. It contains useful information on fish identification, the recreational Code of Conduct, and the rules with respect to a number of other species that are less subject to change than those related to salmon. It has essential information on license requirements, continuing restrictions such as overall possession limits and such things as the prohibitions on the canning of salmon away from one's ordinary residence and the use of downrigger "meat lines" in which the lure cannot detach from the downrigger wire.

However, there is an obvious need to find alternative means to ensure that anglers have reasonable access to conservation rules that may have been established after the guide was printed.

The Operational Policy Framework

In his 1982 report, Peter Pearse recommended that "The government's policy should explicitly recognize sport fishing as a legitimate, valuable and significant use of fish resources, and this should be reflected in a commitment of staff and budget". This was a "necessary first step toward improving its credibility among sport fishermen and generating the needed confidence and support of the sport fishing community".

The most recent step in this direction was the publication in 2001 of a national "Operational Policy Framework" that lays out five "guiding principles for Recreational Fisheries". It says that these principles "will guide Fisheries and Oceans in its task to develop and implement recreational fisheries policies, programs and initiatives".

1. Recreational fishing is a socially and economically valuable and legitimate use of fishery resources.

2. Fisheries and Oceans is responsible for providing sustainable recreational harvesting opportunities as part of integrated management plans consistent with its policies.

3. Recreational harvesters have responsibility for shared stewardship for resource conservation and enhancement.

4. Mechanisms for federal/provincial cooperation in areas of shared jurisdiction will be established and strengthened.

5. Fisheries and Oceans has a leadership role to coordinate policies/programs with the federal government which relate to recreational fishing.

The Sport Fishing Advisory Board

The SFAB is an official advisory body to the Minister and the Department of Fisheries and Oceans. According to DFO's Pacific Region website, "The Department works closely with the Sport Fishing Advisory Board (SFAB) on recommendations to conserve and protect fish and to enhance the recreational fishing experience".[14]

The board was created in August 1964 as the Advisory Committee on Salt Water Sport Fishing. It was formed following confrontation with the department over commercial fishing policy and the success of Victoria anglers in having their area closed to commercial salmon harvesting. The current name was adopted in 1974 and the chair assigned to someone elected by the board, rather than appointed by the department.

The present SFAB structure was adopted in 1988 in an effort to make the process more transparent. A requirement was put in place that a majority of members at all levels be people who do not receive a significant portion of their annual income directly from the recreational fishery. Each of nearly 40 local committees is entitled to elect a representative to attend meetings of the North and South Coast regional committees. These regional organizations in turn elect seven representatives to the main Board. Four province-wide angling organizations and three recreational industry associations have direct membership rights at each level.

At the local committee, regional committee, main board and executive, participants in the SFAB structure maintain a deliberate policy of ensuring that a majority represent the interests of independent anglers (the "primary users") but that there is strong minority representation from people whose economic interests revolve around the recreational fishery (the "secondary users"). In practice this distinction is difficult to define. It is hard to identify a recent issue on which the two supposed points of view were divided.

In short, the SFAB is an inclusive and accountable process whose meetings at all levels are open to the public except on rare occasions. Occasionally, portions of SFAB meetings are held "in camera", not to exclude anglers but to allow the discussion of sensitive tactical issues without the presence of provincial and federal government representatives. Some local committees include representatives from local government and have invited First Nations participation.

While in practice most SFAB decisions are by consensus, the process is formally governed by Roberts Rules of Order and a majority vote on motions is taken when required. Minutes are kept of all meetings and are made available for public scrutiny on the DFO website.

Perhaps the best testimonial to the effectiveness of the SFAB process is the fact that only the recreational sector did not have to make structural changes in order to participate in DFO's recently created Integrated Salmon Harvest Planning Committees. A report from the University of Victoria's Institute for Dispute Resolution said that the SFAB already met the department's test as a region-wide organization that was accountable, transparent, inclusive and broadly representative of individual stakeholder groups and could provide a coast-wide view on both fisheries policy and harvest management issues.

[14] DFO website, http://www.pac.dfo-mpo.gc.ca/recfish/Species/SFAB_e.htm.

5. THE SOCIAL AND ECONOMIC ROLE OF RECREATIONAL FISHING

Salmon Fishing and Leisure Time

Recreation has come to play a major role in our society and fishing plays a crucial role in the recreational process. Even those who might challenge the historical roots of sport fishing, or contest the existence of a constitutional "right to fish", must acknowledge the importance of fishing as a recreational activity. Statistically, recreational fishing can lay claim to be North America's largest participant activity. As pointed out in Phillip Meyer's 1978 study for the federal and provincial governments:

> "Sport fishing is an important activity for urban British Columbians, ranking ninth in Vancouver and eighth in Victoria over the full range of activities enjoyed by Canadians. In more rural Campbell River it ranks first amongst all activities identified....Providing fun, quiet, nature and relaxation, sport fishing plays a key role in the recreational satisfaction of urban British Columbians—and seems ideally suited to provide satisfaction perceived as 'most important in the future'."

Meyer noted that a decline in the availability of this particular form of recreation would have adverse economic and social consequences. "Alternative means would have to be developed to provide nature, quiet and relaxation for urban residents". He said this was not a problem with a simple solution since fishing was unique. "Study data shows that no other single activity exists that will provide a perfect substitute for a sport fishing experience".

Warning that "this has too often not been the case in the past", he recommended that "the satisfaction sought by British Columbians from sport fishing and other forms of recreation be fully represented when resource allocation decisions are made".

Participation in the Recreational Salmon Fishery

Although definitive participation numbers only became available with the introduction of a saltwater sport fishing license in 1981, there were some earlier efforts to collect these data. A 1979 study by Loftus and Masse pulled together information from a number of sources and concluded that in 1975 there were 364,000 active anglers fishing tidal waters in B.C. They projected that by 1981 this number would grow to 425,000.[15]

This forecast proved to be overly optimistic. In 1981, the federal government implemented a new recreational fishing license for tidal waters, issuing 282,200 that first year, 228,000 to Canadian residents and 54,000 to visitors. It has to be understood, however, that in addition to introducing the new licensing system, DFO announced a number of conservation measures designed to reduce the sport harvest of chinook salmon. As pointed out by Peter Pearse in the final report of his 1982 Royal Commission on Pacific Fisheries Policy, "These and the ensuing heated debate among sport fishing organizations, created an unsettled climate throughout the year and adversely affected participation in the fishery, particularly the non-resident component".[16]

[15] P. Loftus and W. Masse, *The Impact of SEP and SEP Cost Recovery on British Columbia Sport Fisheries,* Department of Fisheries and Oceans, December 15, 1979, p. 5.
[16] Peter H. Pearse, *Turning the Tide: A New Policy for Canada's Pacific Fisheries,* Final Report of the Commission on Pacific Fisheries Policy, September 1982, p. 188.

Loftus and Masse had projected that the total number of tidal water anglers would grow to 793,000 by 2005. Again, their optimism proved unwarranted. The numbers did grow after 1981, reaching 453,459 in 1993. They then declined to a low of 307,777 in 2000. There has been slow improvement since with 332,693 issued in 2004. The biggest single decline in participation took place in 1996 when an increase in license fees coincided with severe conservation measures aimed at protecting vulnerable chinook runs. Sales of annual resident licenses decreased by 43,000, or 12% and sales to non-residents fell by more than 50%. The following figures show the long term trends with respect to both resident and non-resident licences.

Figure 1. Resident Licences

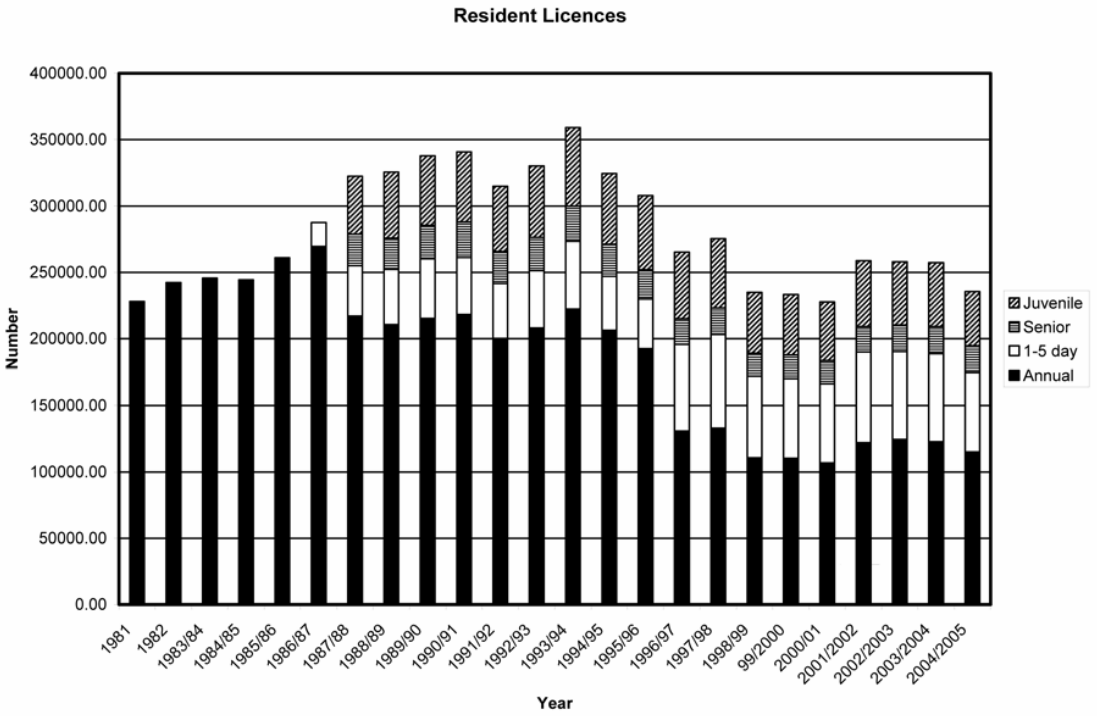
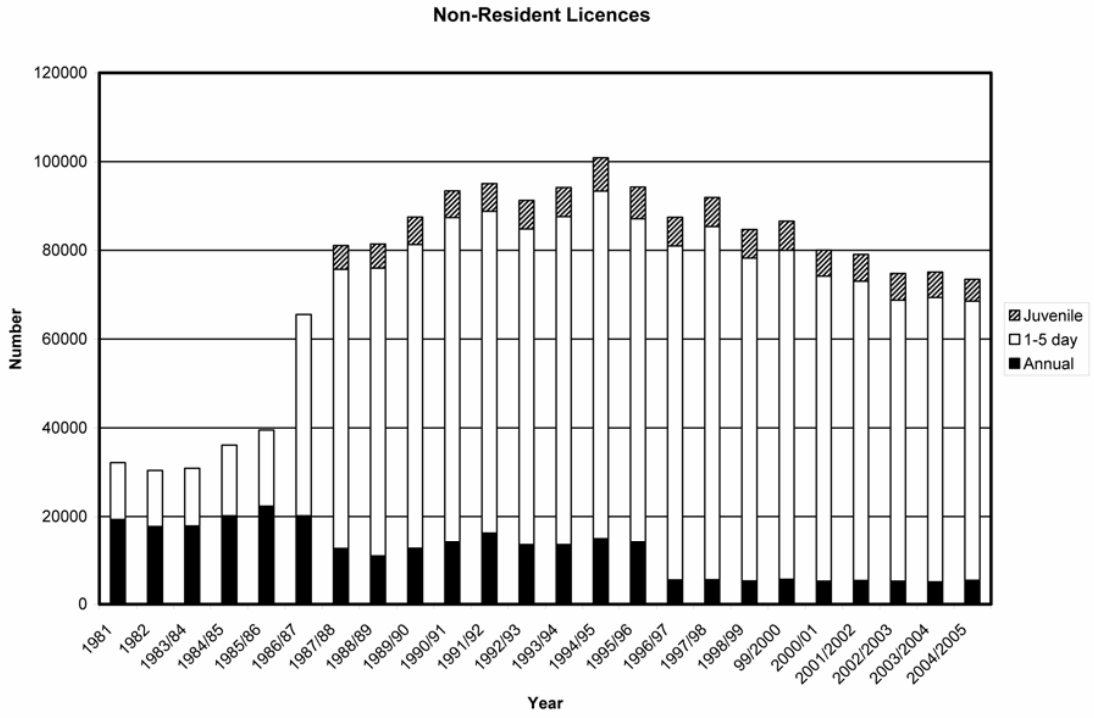


Figure 2. Non-Resident Licences



The number of juvenile anglers (under the age of 16) provides an indicator of future angling effort, since many anglers who fish as children continue to do so as adults. As shown in the earlier Figures 1 and 2, this number has held steady over the years, despite changes in adult sales.

The Average Angler

The 2000 Survey of Recreational Fishing in Canada provides an interesting profile of what it terms "active tidal waters anglers". Amongst B.C. residents, 73% were men with an average age of 41. Female anglers were younger, with an average age of 31. Non-resident anglers were older and had a lower proportion of women.

According to the survey, tidal anglers in B.C. waters spent 63% of their time fishing for salmon. They hooked 1.4 million, keeping 484,655. They fished from a boat 83% of the time. 9% employed a guide and 7% entered a fishing derby.

In the 2000 survey, 38% of tidal anglers reported that the number of days they fished for salmon had decreased since 1995 and 50% said their success rate had fallen. Thirty-one percent said that due to the decline in salmon stocks they had chosen to target another species.

Of direct significance with respect to conservation is the fact that 42% of tidal anglers were not aware of the head recovery program for adipose clipped fish. Since the recovery of coded wire tags is essential to the determination of stock specific harvest rates, and since the recovery rate for tags has declined for a number of reasons, a need for more angler education is obvious.

Recreational Catch Shares

For many years no formal count was made of the recreational salmon harvest. Its impact does not seem to have been considered worth the effort and cost of collecting data. In 1982, Peter Pearse noted in his report that "Until relatively recently, sport fishing was of little consequence to [DFO] resource managers".[17]

Against a background of statistical ignorance, estimates of the recreational share of the total salmon harvest varied between 4% and 7%. A presentation to the SFAB by DFO officials in 1981 used this range and said that recreational anglers were catching between 1.3 and 2 million salmon, of which between 500,000 and 750,000 were chinook. This harvest was estimated to comprise about 30% of the total coast wide catch of chinook, and a higher proportion in Georgia Strait.

Evidence that the recreational share of chinook and coho had become substantial in both absolute size and percentage share made clear the need for better data to ensure that conservation requirements were being met. The mounting of a comprehensive creel survey and other data collection in the 1980s and 1990s, following on the recommendations of the Pearse Commission, has improved the accuracy of recreational harvest statistics. When DFO issued its "New Directions" allocation paper in 1998 it laid out the generally accepted numbers. It chose a number at the low end of the earlier range, asserting that "since the early 1980s, the commercial sector has harvested about 97% of the total salmon taken by the commercial and recreational fisheries".

It has to be said, of course, that the 3% number masks both the higher recreational impact on chinook and coho and regional concentrations of harvest that may affect individual stocks. The New Directions paper said that for the 1991–97 period the recreational chinook harvest averaged 32.5% and the coho catch 15% of the combined recreational-commercial total. The following tables extend to these data to 2004.

[17] Peter H. Pearse, *Turning the Tide: A New Policy for Canada's Pacific Fisheries*, Final Report of the Commission on Pacific Fisheries Policy, September 1982, p. 191.

Figure 3. Chinook Catch Shares

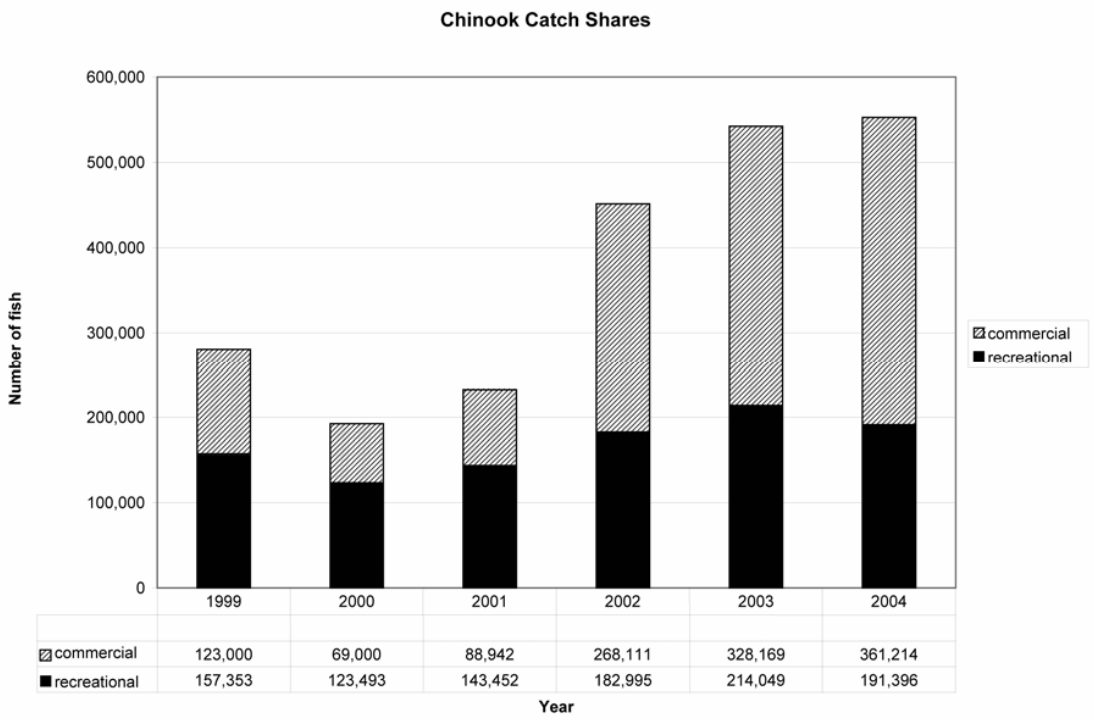
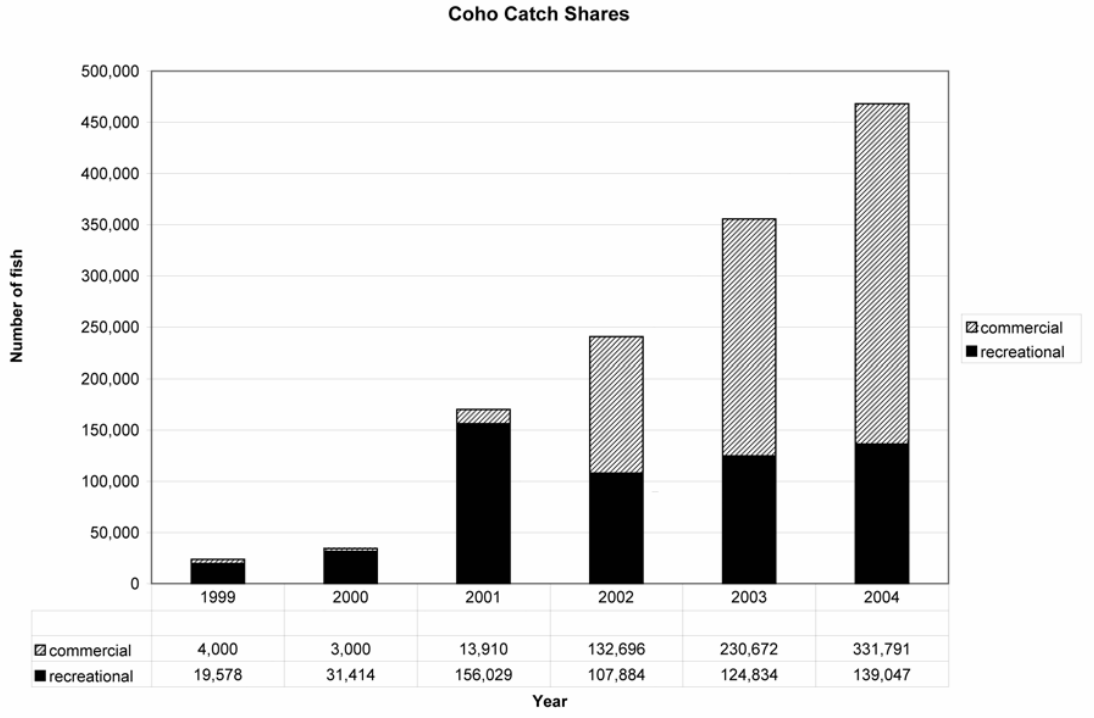


Figure 4. Coho Catch Shares



Recreational Fishing Success Rates

On a per fish basis, in 2004 the 332,693 licensed tidal water anglers caught 453,218 salmon, or an average of 1.4 salmon per angler. With respect to the separate species, tidal anglers caught an average of one-half a chinook each, one-third of a coho, one- quarter of a sockeye, one-twelfth of a chum and one-fourteenth of a pink.

It is obvious that these averages disguise the fact that some anglers are much more successful than others. In his 1982 report, Peter Pearse concluded that "Ten percent of the fishermen catch more than half of the total catch, while nearly 40 percent catch no salmon at all".[18] Tidal water anglers surveyed in DFO's *2000 Survey of Recreational Fishing in Canada* claimed to have kept an average of 5.2 fish of all species and these recall numbers probably are biased on the high side. For example, respondents to the survey claimed to have caught 239,783 chinook salmon while the DFO creel survey says the actual number was 133,248.[19] The difference between these two numbers highlights the need for accurate catch monitoring to support conservation efforts.

The low individual rate of success per angler and the relatively modest total harvest compared with other extractions, tend to mask the fact that the proportional impact can be much higher in local areas and with respect to local stocks. An example is the Fraser in-river sockeye fishery in which the combination of increased abundances of fish resulting from reduced commercial catches; a new harvest technique, "flossing"; and proximity to a large urban area; have led to a major increase in recreational activity and catch. The sector has demonstrated the ability to catch large numbers of sockeye in a short period of time, growing from annual catches of around 10,000 to as high as 150,000 sockeye. Even here, according to the DFO creel survey, in 2004 it took anglers 325,687 hours to catch 50,388 fish, for an average of 6.46 hours per sockeye. The success rate doubled in 2005 when, during a very brief fishery September 1–7, anglers spent 132,383 hours catching 42,612 sockeye, for an average of 3.1 hours per fish.[20]

The technique called "flossing" has been perfected in the last few years and it is controversial, even within the recreational community. Some say it amounts to jigging or snagging. Others defend it as a fishing method that gives ordinary non-aboriginal Canadians an opportunity to harvest Fraser sockeye during the period when no other hook and line technique is effective after these fish have entered fresh water. A barbless hook, associated usually with a small patch of colored yarn material, is rigged at the end of a leader as much as 15 feet from the casting weight on the line. This is cast and retrieved across the current. While sockeye salmon have stopped feeding when they enter fresh water, some still react instinctively to the presence of a lure. In addition, since fish swim with their mouths open, when they are present in concentrated numbers it does not take long before a line crosses the open mouth like a piece of dental floss and the retrieving hook catches the fish in the outer side of the jaw. This is a legal catch since "foul hooking" or "snagging" is defined in the sport fishing regulations as willfully "hooking a fish in any part of its body other than the mouth".

[18] Peter H. Pearse, *Turning the Tide: A New Policy for Canada's Pacific Fisheries*, Final Report of the Commission on Pacific Fisheries Policy, September 1982, p. 189.
[19] Fisheries and Oceans Canada, *2000 Survey of Recreational Fishing in Canada, Economic and Commercial Analysis, Report No. 165*, Ottawa, 2003, pp. 40-43.
[20] Detailed creel survey data is available on the DFO website at http://www.pac.dfo-mpo.gc.ca/fraserriver/recreational/recfisherycreel_e.htm.

Economic Impact

The recreational fishery makes a substantial contribution to the British Columbia economy. The ARA Consulting Group found in 1996 that it created greater expenditures, value and impacts with a lower harvest of salmon than did the commercial fishery.[21] This has not changed. Recreational fishing continues to be the largest of the four industries that make up BC's fisheries and aquaculture sector: commercial fishing, aquaculture, fish processing and sport fishing.[22] It accounts for 39% of the sector's contribution to provincial GDP. Recreational fishing also makes a direct contribution to government revenue. The 1996 ARA study found that the federal and provincial governments were receiving $77 million a year in commodity tax revenue as a result of tidal water sport fishing.

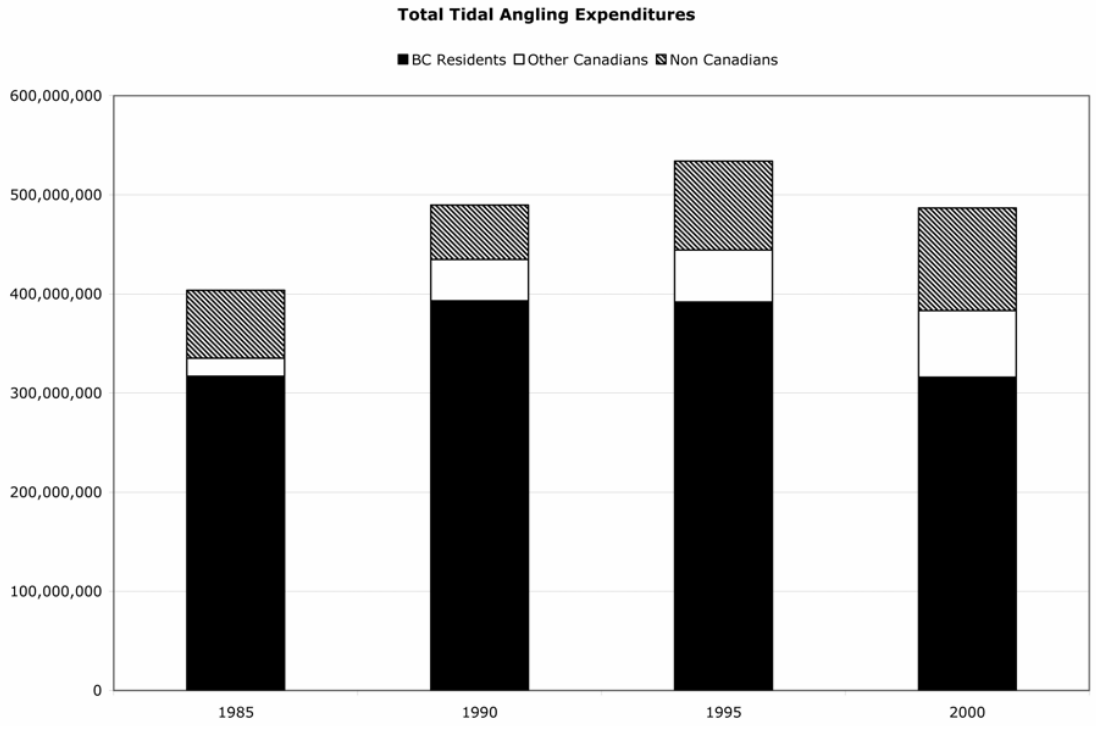
Salmon anglers each purchase a $6.42 conservation stamp with their fishing license, but only $1.00 of this flows directly to the Pacific Salmon Foundation for conservation projects. Total revenue to the federal government from recreational license sales, including the salmon stamp, was $6.7 million in 2004/05. According to Pearse/McRae even this small portion of the total revenue "is not related to expenditures on recreational fisheries management, and significantly exceeds current expenditures".[23] This complicates discussion of government efforts to increase license fees in an effort to impose "cost recovery" on the recreational sector for such things as catch monitoring.

Angler Expenditures

Angler expenditures are good indicators of the sector's economic value. GS Gislason & Associates report that tidal fishing injected $550 million dollars into the economy in 2002[24]. They note that expenditures peaked in 1994, dropped during the remainder of the1990s, and began to rise again in the new millennium.

[21] ARA Consulting Group Inc., 1996. *The Economic Value of Salmon: Chinook and Coho in British Columbia.*
[22] BC Stats, Victoria, 2002. British Columbia's Fisheries and Aquaculture Sector.
[23] Ibid. p. 45.
[24] Gislason, GS. 2004. *British Columbia Seafood Sector and Tidal Water Recreational Fishing: A SWOT Assessment.*

Figure 5. Total Tidal Angling Expenditures



Individual British Columbians spend more on tidal fishing than out-of-province anglers. In general, more money is spent on direct expenditures (transportation, food and lodging, fishing services and supplies and packages) than on capital expenditures (boats, motors, fishing and camping equipment, special vehicles and real estate). While BC residents spend less per day to fish, they spend more in total on tidal angling because they fish more than twice as many days on average.

Employment

According to BC Stats, tidal water fishing generated 4,300 jobs in 2003 and 4,600 in 2002. Wages and salaries generated in 2003 are estimated at $82.0 million and at $82.3 million in 2002. A study by GS Gislason & Associates suggests that the provincial figures, based on labour survey data, underestimates the contribution of the tidal water fishery.[25]. They estimate that the industry supported 7,420 jobs, 3,590 person-years and $125 million in wages and benefits in 2002. The Gislason profile also reveals that lodges and charters represent 35% of jobs in the industry.

[25] Gislason, GS. 2004. *British Columbia Seafood Sector and Tidal Water Recreational Fishing: A SWOT Assessment.*

6. Conservation Implications of Issues Facing the Recreational Fishery

Shifts in Fishing Effort

When Peter Pearse was conducting his royal commission in 1982, angler effort in Georgia Strait involved 559,393 boat trips. These fishermen caught at least 538,938 salmon. By contrast, in 2004 angler effort in Georgia Strait was 57,842 boat trips, 10% of the earlier number, with a salmon catch of 49,996, just 7% of the 1982 catch.

In terms of species, in 1982 Georgia Strait recreational anglers caught 124,402 chinook and 411,402 coho. DFO didn't count the sockeye and chum catch. In 2004, the Georgia Strait chinook catch was 38,000 and the coho harvest 9,500.

Pearse estimated that Georgia Strait accounted for 90% of the coast wide recreational salmon catch. This would have meant that anglers outside Georgia Strait were catching about 60,000 salmon in 1982 and seems a reasonable estimate. In 1984, the first year for which statistics are available, the West Coast Vancouver Island catch was 47,157. North Coast recreational catch numbers became available the following year and totalled 66,442 salmon. In 1985, Georgia Strait anglers caught 962,969 salmon of which 728,167 were coho.

By 2004, the situation had changed dramatically. The North Coast sport harvest had grown 300 percent, to 198,767 and on the West Coast of Vancouver Island, anglers had caught 125,787, of which only 23% were chinook. On the other hand, the Alberni canal sockeye catch, which was considered inconsequential in 1984 and not recorded, had grown to 79,787, or 63% of the WCVI recreational salmon catch

As already mentioned elsewhere, one other major shift in fishing effort was the development of a recreational sockeye fishery in the non-tidal portion of the Fraser River. This fishery simply did not exist on any scale in the 1980s. No data were collected. A serious creel survey was first mounted in 2002, revealing 281,053 angling hours of effort and a catch of 125,040 sockeye. In 2004, effort had grown to 325,687 angler hours of effort for a smaller catch of 50,388 sockeye.

One of the troubling aspects of these shifts in angler effort is the fact that despite a dramatic drop in both effort and catch in Georgia Strait, the health of many chinook and coho stocks does not seem to have improved. Several, such as Cowichan and Nanaimo chinook, are in serious trouble. This raises the question of whether shifts in both recreational and commercial effort to areas where the stocks are more mixed is having a negative impact.

One other related issue is what seems to be growing tension between ocean and fresh water recreational harvesters. There is a need for government to grapple with the implications of this tension. When the allocation policy was put in place, the recreational sector agreed to lower retention limits for fresh water as opposed to ocean harvest on the assumption that the closer the fish were to the spawning grounds, and the more that runs were differentiated, concentrated and easy to access in relatively confined circumstances, the more precautionary the rules had to be.

Restoration of the Georgia Strait Sport Fishery

As is clear from the numbers cited above, there has been a dramatic reduction in fishing effort and success in the Georgia Strait area that used to be the main focus of recreational activity. The primary reason appears to be a decrease in salmon abundance in the Strait. There is evidence that this change is the result of an ecosystem change which has made the Strait more hospitable to pink and chum and less favourable to chinook and coho.

Since this situation does not seem to have been addressed by dramatic reductions in harvest pressure, it raises the question as to whether alternative approaches ought to be considered. It has been suggested, for example, that it might be worth experimenting with different timings in release of hatchery coho so that they are better able to compete with other species in the current environment. Measures like this obviously require close scientific scrutiny but could be the sort of experiments that are warranted as climate change takes effect.

Mixed Stock Fishing

The recreational sector does have to recognize that many of its most productive tidal water chinook and coho fisheries, especially those off the Queen Charlotte Islands and the West Coast of Vancouver Island, are mixed stock fisheries. While the sector's fishing power is much smaller than that of the commercial sector, it has the potential to affect smaller and weaker stocks while concentrating on the more productive. There is an obvious need to collect data to ensure that this is not happening.

Pacific Salmon Treaty Abundance-based and Total Mortality Management for Chinook and Coho

There has been a substantial change in the way in which trans-national stocks are being managed under the Pacific Salmon Treaty.

Coho Management: In the case of coho, Canada is now bound by an arrangement which sets exploitation rate limits on stocks, depending on their overall abundance. This means that DFO has a greater obligation to manage within these numbers on stocks that are of primary interest to the recreational sector.

In practice, Canada has managed much more conservatively than is required under the treaty. The policy with respect to interior Fraser coho, and the effort to keep Canada's exploitation rate below 3%, has meant severe restrictions on all harvest. In practice it has meant that there has been no retention of wild coho in Georgia Strait (and some other areas) since 1998. The only mortalities have been those incidental to the harvest of marked coho—the ten to fifteen percent of wild fish that do not survive being caught and then released. Northern coho fisheries have returned to normal bag and possession limits.

The changed coho fisheries in the South involve calculations which require data not previously needed. For example, if "mark-release" fisheries are to be allowed, DFO needs to know the ratio between marked and unmarked fish in the population to be fished. Since there is a mortality level attendant upon the release of an unmarked wild fish, it would be unwise to allow or encourage such a fishery if it means that the angler has to "sift" through too many unmarked fish before he catches a coho he can legally retain. The department has calculated the 2005 mark rate in Georgia Strait to be 18%, and believes this "likely is a minimum estimate".[26]

In addition, of course, it is hard to convince an angler who frequently encounters and has to release wild fish, that these fish are facing a conservation problem. Indeed it raises the need to calculate the point at which the actual mortality level on the wild fish would be lower if anglers kept the first fish they encountered, marked or unmarked, rather than being encouraged to sift through many unmarked fish until they find one from a hatchery.

[26] DFO, *Preliminary Southern BC Post-Season Salmon Review 2005*, February 9, 2006, p.28.

Chinook Management: In the case of chinook, the 1999 treaty now requires both countries to manage based on total mortality. The annual harvest is based on abundances as shown by the Chinook Model. This number is assumed to include a number of additional "incidental" mortalities. Each country has committed to stay within this total, as calculated against the "standardized regime" in place when the treaty was signed. If a party can show that new measures have resulted in a reduction of these mortalities provision is made to add half of these savings as catch, with the remainder flowing downstream as an additional benefit to others.

It is unlikely that the total mortality ratios for Canada's commercial fisheries can be reduced significantly. Unlike Alaska, Canada has no net fisheries in the offshore area that intercept substantial numbers of chinook while targeting other species. The troll fishery operates on strict numbers within the treaty, with relatively short periods of Chinook Non Retention as compared with the base period and the standardized regime. However, one factor that might increase incidental mortality is Canada's experiment with individual quota-based chinook troll fisheries. This could lead to increased overall mortality if fishers are tempted to sort through incoming fish to select those of the highest value in terms of size and colour. Since the average mortality rate on chinook caught and released by commercial trollers is 25%, highgrading could affect the size of the commercial allocation as well as conservation and Canada's interests under the treaty.

The potential of the recreational sector to affect total mortality also exists. Growing abundances of chinook increase the encounter rate for anglers in places like the Queen Charlotte Islands and off the West Coast of Vancouver Island. As the encounter rate increases, so does the number of mortalities caused by the hooking and releasing of fish as anglers release smaller chinook in an effort to catch a "trophy", as they utilize "catch and release" for the fun of "playing" fish, or as they continue fishing for coho after they have caught their chinook limit. Although the release mortality rate for the recreational sector is lower at 15%, the first two practices also could be described as a form of highgrading. Under the terms of the salmon treaty Canada must account for these mortalities and stay within the total mortality number as calculated against the standardized regime. In effect, under the priority access policy this could necessitate a reduction in the fish available for harvest by the commercial sector if the total number of mortalities caused by everyone is greater than those in the treaty's base period.

While the mortality levels attendant upon the catching and releasing of mature chinook are well established, less data are available on encounter rates and how to estimate them on an annual or seasonal basis. Canada needs to gather this sort of data for both of its Aggregate Abundance Based (AABM) fisheries.

There also may be a need to change angler attitudes. Given both the international obligation and the fact that increased incidental mortalities are, in effect, depriving the commercial sector of fish with economic value, Canada and the recreational sector might benefit from a process whereby anglers were encouraged not to gratuitously play "catch and release" or to sort through numbers of fish in an effort to catch the biggest available.

Trigger Points for Directed Commercial Chinook and Coho Fisheries

There is a need to define the stock abundance levels which trigger commercial fisheries. The New Directions policy states that for directed commercial fisheries to take place for chinook and coho, harvestable surpluses must be large enough to "allow for a directed recreational fishery based on limits of 2 per day and 4 in possession for chinook and 4 per day and 8 in possession for coho". The policy document does not spell out any geographic or stock specific parameters to this policy. Does it mean, to take an extreme case, that there should be no directed commercial chinook fisheries until all recreational fisheries coast-wide are at full limits? Conversely, does it mean that if recreational fisheries in a particular area are at full limits, then the commercial

fisheries in that same area are entitled to target chinook, even though they may be harvesting mixed stocks of varying abundance levels?

These questions raise conservation issues because most of Canada's remaining commercial chinook fisheries are troll fisheries which operate offshore in areas where stocks are mixed. To use the terminology of the Pacific Salmon Treaty, these AABM (Aggregate Abundance Based Management) fisheries are targeting a mixture of stocks returning to both Canadian and American rivers. Even if the overall abundance in one area is sufficient to justify full recreational limits and full commercial retention within the overall limits of the treaty, a commercial fishery may have specific implications for weak stocks. It is for this reason that in recent years the Northern Troll fleet in Area F near the Queen Charlotte Islands has been managed using DNA sampling to determine when the presence of fish of West Coast Vancouver Island origin is such that the fishery must be closed to protect weak elements of this stock group.

Similarly, the recreational sector has asked DFO to try and determine through DNA sampling when other weak stocks such as the iconic Wannock chinook from Rivers Inlet are present in the AABM fishery. Since recreational anglers closer to the terminal area are being asked to implement conservation measures on these fish, it is argued that the "priority access" provisions of the allocation policy ought to dictate appropriate conservation action by the commercial fleet.

By the same token, of course, the recreational sector has to face the fact that since some of its more productive fisheries also take place in the AABM areas in both Northern BC and on the West Coast of Vancouver Island, they also are subject to questions about their impact on weaker or smaller stocks.

Distinguishing "Bycatch" from "Incidental Harvest"

While the New Directions policy settled the primary issues of salmon allocation between the recreational and commercial sectors, it left a number of details unanswered. Some of these details have implications not only for the harvest interests of both parties, but also for conservation of various stocks and species.

For example, it has been agreed that a clear distinction needs to be made between the term "bycatch" as "the unintended harvest of one species while fishing for another species" and "incidental harvest" as "the unintended harvest of one stock of a species of fish while targeting fishing on other stocks of the same species". The difference is important because, as mentioned earlier, the right of the commercial sector to bycatch mortalities of chinook and coho while targeting sockeye, pink and chum, was an essential quid pro quo to recreational priority access. It means that recreational fisheries on chinook and coho may have to be closed for conservation reasons so that commercial fisheries on sockeye, pink and chum can continue. On the other hand, the incidental harvesting of a weak stock of chinook or coho during commercial fisheries targeted at more abundant stocks of the same species raises obvious conservation issues.

The 5% Sockeye Cap

The commercial sector has questioned whether the substantial harvest of Fraser sockeye by the recreational in-river fishery in recent years has brought the sector up against the 5% cap and triggered the need for harvest reductions. This allocation issue does not appear to have direct conservation implications.

While the proportionate catch of pink and chum remains relatively insignificant, the recreational sockeye harvest number has increased significantly in recent years, both in total numbers and as a proportion of the combined recreational/commercial harvest. Ironically, both changes are a direct reflection of a significant decrease in the size of the commercial harvest. The base against which

the 5% cap is measured has been reduced because of a desire by DFO to give First Nations greater access to food, social and ceremonial fish and because overall harvest opportunities have been affected by low returns to the Skeena, the loss of sockeye fisheries in Rivers and Smith Inlets, and Barkley Sound returns that have not performed as expected. In addition, there has been reduced commercial harvest and larger escapements into the Fraser because of conservation problems associated with interior Fraser coho and with aberrations in the run timing of Fraser sockeye.

This reduction in the commercial catch has meant significantly larger concentrations of sockeye migrating up the Fraser through the area upstream of Mission where recreational anglers have access from the banks and gravel bars and from boats anchored mid-stream. The bottom line is that the recreational harvest has increased while commercial catches have declined, causing the sector to bump up against the 5% coast-wide ceiling. This increased recreational catch takes place upstream of the area where endangered Cultus Lake sockeye are vulnerable and has been demonstrated to be a clean fishery with respect to other species.

Marginal Utility: The Tension between Economic Value and Conservation

In all fisheries, there is an inevitable tension between those whose economic interests are tied to annual harvest and those dedicated to conservation.

The recreational sector is no exception. People whose livelihood is tied to facilitating fishing opportunities, whether they be boat builders or vendors, marina operators, charter boat skippers or fishing lodge operators, readily understand the value of conservation and the need to ensure the long term survival of abundant stocks. On the other hand, their short term interests demand current access to fish and they are sceptical of conservation proposals that put these interests in jeopardy by imposing short term pain that does not seem consistent with long-term gain.

Two examples help to illustrate this point as well as show the extent to which confrontation between DFO and angling representatives has led to attempts by the department to accommodate recreational interests while still applying the precautionary principle.

In 1996, as a response to what was predicted to be much reduced levels of chinook returning to the West Coast of Vancouver Island as a result of El Nino induced mackerel predation on outgoing juvenile fish, department biologists proposed that there be no harvest of chinook in the Queen Charlotte Islands or along the West coast of the island during that year's fishing season. The proposal was resisted strenuously by recreational representatives who put forward an alternative set of conservation measures. These were rejected by department officials even though they agreed that the substantive difference between the two plans was that the DFO version provided a net escapement gain of 57 female chinook to the indicator stock. A subsequent report by British Columbia's Job Protection Commissioner said that this decision "resulted in over $130 million in lost revenues for businesses affiliated with the recreational fishery". [27]

Similar tensions with respect to coho surfaced in 1998. In response to what was predicted to be drastically reduced ocean survival of coho originating from the interior Fraser and Interior Skeena areas, Fisheries Minister David Anderson prohibited the retention of coho anywhere on the BC coast and imposed a series of "red zone" time and area closures on all salmon fishing to eliminate incidental encounters with coho. A suite of alternative measures put forward by the recreational sector was rejected.

[27] B.C. Job Protection Commissioner, *Fishing for Money: Challenges and Opportunities in the B.C. Salmon Fishery,* report prepared by Gislason & Associates, June 10, 1998, p. 8-3.

Again, the argument was about the relative economic costs compared with the conservation benefits. It was demonstrated that the measures being imposed in Minister Anderson's home area of Victoria, by comparison with those proposed by the SFAB, resulted in an economic loss of $20 million in exchange for an increase in escapement of 14 coho. Of course, in both cases, conservation advocates were able to make the valid point that the conservation benefits were not limited to the indicator stocks.

The arguments put forward by the recreational sector, and the economic costs attested to by the Jobs Commissioner and others, seems to have prompted a re-assessment inside DFO. In subsequent years when similar issues were raised with respect to WCVI chinook, the department was more willing to accept a suite of conservation measures similar to those proposed by the recreational community in 1996. These included a "conservation corridor" along the coast of the island to protect fish homing on local rivers, closure of particularly "hot" fishing spots, and a size-based "slot limit" aimed at having anglers target on fish of a more abundant generation while releasing those in the weaker age category. In the case of coho, while conservation of interior Fraser stocks remains a strong priority, the department has eliminated the "red zones" and accepted measures that allow the retention of hatchery-marked coho but require the release of wild fish.

Although the recreational fishery is not driven by maximizing the harvest of a targeted fishery, it is obvious that there are thresholds where a reduction in the ability to catch and keep a fish will directly impact participation rates and economic value. Since closures can have a devastating economic impact, the primary management goal should be to shape the fishery to allow for continued opportunity while meeting conservation objectives.

The Rise of the "Commercial" Sport Fishery

A great many commercial entrepreneurs depend upon sport fishing for an important part of their income. These businesses range from lodges and charter boat operators, who provide customers with direct access to fishing opportunities, to boat and tackle retailers, wholesalers and manufacturers.

This fact has led to the assertion by some that a distinction should be made between "personal" and "commercial" recreational fishing and that a separate allocation of salmon be made to lodges and resorts, subject to rules in some ways similar to those which government applies to the commercial fishing sector. Some commercial fishers see this both as a way to protect their investments against growth in the size of the recreational fishery and as an opportunity to profit from their current access by selling it to a lodge. As the owner of a salmon troller told the enquiry headed by former Deputy Minister Art May, "if Bob Wright wants more fish for his lodge in Campbell River, then he should have to buy it from me."

The notion of allocations "owned" by recreational lodges fit well with May's enthusiasm for "a system of individual transferable quotas (ITQs) or similar "rights-based allocations". He saw these having "most, if not all, the characteristics of private property". On the other hand, a discussion paper prepared for him by three consultants reported a consensus within the recreational fishery that "allocating a share of salmon to individual sport fishing businesses is wrong—and would pre-empt the rights of individual Canadian anglers".[28]

[28] Edwin Blewitt, Philip Meyer, and Timothy Taylor, *Discussion Paper: Policy Options for the Intersectoral Allocation of Salmon in British Columbia*, Vancouver, July 31, 1996, p. p. 3-7. Emphasis in original.

Attempts to divide the recreational sector into these two categories have been resisted strenuously. Recreational representatives argue that the opportunity to try and catch a salmon is and must be regulated by possession of a license issued by the Department of Fisheries and Oceans. Lodges and charter boat operators simply facilitate access. Whether a person chooses to fish from his own boat, using his own rods, or whether he chooses to stay at a lodge and use its gear, or pay a charter skipper to take him out on the water, all that the various businesses are doing is offering alternative forms of access.

The argument that lodges or charter boats should be perceived as selling opportunity rather than fish is undermined by the higher success rate of their customers and by marketing which shows happy customers standing with full possession limits of salmon and halibut. It is obvious that this harvesting success needs to be accompanied by accurate catch monitoring.

SFAB Responsibility for Catch Monitoring

DFO's national Operational Policy Framework for recreational fishing states as a guiding principle that "Recreational harvesters have responsibility for shared stewardship for resource conservation and enhancement" and that this means "recreational harvesters and the sport fishing industry…will be encouraged to partner with government and to participate in the decision-making process to manage and protect the resource. Contributions to the cost associated with ensuring such benefits are also necessary. These may take the form of access fees".

More recently, the department announced that "Over the longer term, the costs of catch monitoring and reporting will be the responsibility of each harvesting group". It served notice that it wishes to implement this policy in the near future and asked "How can the sport fishing sector self-fund fishery monitoring and catch reporting".[29]

There is an obvious need to clarify what is meant by terms such as "partner" and "co-management" in the context of recreational fishing. How does a "harvest group" composed of nearly 400,000 individual anglers represented by volunteer advisors take on the job of conducting and financing a task with such important conservation implications as catch monitoring? The SFAB has no legal or corporate existence beyond the department's willingness to fund the cost of meetings. From time to time, the suggestion has been made that it should be constituted as a non-profit society, perhaps sustained by direct funding from licence fee revenues and staffed by board employees rather than public servants. There has been resistance to this approach from within the SFAB since it would bring about a fundamental change in the dynamics of what has been, to date, a purely volunteer process.

The reality is that the current SFAB process probably has reached the breaking point. It would collapse were it not for the extraordinary amounts of time contributed by some board members. It has little or no capacity to take on new operational responsibilities of the sort implicit in managing a catch monitoring effort.

There are some obvious ways in which the sector can co-operate in order to ensure better harvest data are available. It is not surprising that guided anglers have a higher success rate than those who do not have this expertise available to them. As a result, it makes sense to facilitate the keeping of logbooks by guides. The department needs the practical experience of the sector in setting up the most efficient and cost-effective means of securing this information. It also needs to consider what safeguards are necessary to ensure that the resulting information is not biased by the self interest of the contributors.

[29] http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/fisheriesmgmt/reportingframework/monitoringpaper_e.htm#8.2.%20Recreational%20Fisheries.

Selective Fishing: Regulating the Tackle Box

An issue of some importance for the recreational sector is the extent to which the fishery should be regulated "through the tackle box", that is by attempts to control the type of gear used by anglers.

An early example of this was an abortive attempt to ban downriggers in the 1980s. It was felt by DFO that recreational anglers were becoming too efficient and that this recreational adaptation of commercial troll gear was leading to excessive harvest. While the proposed regulation eventually was abandoned as impractical, one aspect of it remains. Downriggers can only be used when the fishing line is attached to the downrigger wire by an automatic release clip. This outlaws what used to be called a "meat line", a heavy line which was fixed to the downrigger wire and fished constantly!

Another important example of regulating the tackle box was the banning of barbed hooks as a coho conservation measure in 1998 despite a lack of data to show a measurable difference between the release mortality rates when barbed or barbless hooks were used. There is a need for rigorous studies of various fishing techniques and gear types in an effort to identify those that might have the least adverse impact on released fish. There is evidence, for example, that the mortality rate on released fish increases if the hook has been swallowed.[30] The use of circle hooks instead of j-hooks might be an improvement since the shape of a circle hook would seem to reduce the probability that the hook will be ingested and increase the chance that it will catch around the jaw bone of the fish. This theory needs more testing. Should it prove valid, there would be a need to persuade anglers to change both gear and fishing techniques since the "setting" of a circle hook involves different action than is the case with j-hook.

The SFAB has approved some interventions into the tackle box. The use of treble hooks has been prohibited in a number of places, vessels have to be rowed in the Tyee Pool at Campbell River, and downriggers are not allowed off the mouth of the Campbell River or at the head of Rivers Inlet.

In addition, the recreational sector has been an ardent supporter of the principle of mark selective coho fisheries—those based on clipping the adipose fin of hatchery-produced coho so that they can be differentiated from wild fish when hooked by an angler. The SFAB also has supported the continued operation of hatcheries, particularly those producing chinook and coho in areas where the natural production has been eliminated by urbanization.

Changing Social Values and Attitudes: "Ethical Treatment"

Recreational fishing has become the target of a worldwide attack by animal rights organizations. Ironically, part of this attack relates to one of the processes often advanced as a conservation tool, namely fishing on the basis of "catch and release".[31] It is obvious that total mortality is reduced when fish are caught and released—a kept fish is a dead fish while 85% of released chinook and coho will survive. In the context of efforts to reduce the mortality rate on a non-target species, for example, non-retention makes good sense. The harvest of an abundant species can continue, with all of its social and economic benefits, while the mortality impact on a less abundant species is limited to the release mortality rate.

[30] *Catch-and-Release Mortality of Coho Salmon in the Fraser River, British Columbia*—Summary, March 2, 2000. See DFO website: http://www.pac.dfo-mpo.gc.ca/fraserriver/recreational/recfishery99sprtcatch_e.htm.
[31] DFO website on "non-retention". http://www-comm.pac.dfo-mpo.gc.ca/publications/angling/default_e.htm.

On the other hand, a deliberate policy of catch and release may be playing into the hands of the opponents of fishing. Most people are not vegan and are prepared to accept as ethically justified the humane killing of animals for food. In this context, the mortality attendant on the release of a non-target species can be supported. It is much more difficult to argue ethical justification if the only purpose of the activity is human amusement.

As a response to such ethical questions, the SFAB has adopted the following Code of Conduct.[32]

Code of Conduct for Sport Fishing in British Columbia

Fishing responsibly not only means protecting the environment and the resource, but also practicing safe fishing habits and respect towards others.

1. Handle all fish with care.
2. Limit your catch to ensure fish for the future.
3. Leave your fishing spot cleaner than you found it.
4. Respect the rights of property owners and other outdoor enthusiasts.
5. Use the proper tackle and methods for the species being targeted.
6. Promote the sport by teaching children and new participants how to fish.
7. Become informed about your fishery and participate in its management.
8. Report all illegal fishing activities to the proper authorities.
9. Respect the space of others. Leave enough room for everyone to fish.
10. Learn the fishing and boating laws and abide by them.

This Code of Conduct has been developed and endorsed by the Sport Fishing Advisory Board. Fisheries and Oceans Canada < www.pac.dfo-mpo.gc.ca/recfish/Species/SFAB_e.htm> and the Province of B.C. support this initiative.

The Code reflects the concern of the SFAB with respect to ethical issues that have come to revolve around recreational fishing and its strong support for vigorous enforcement of the rules related to sport fishing and initiatives such as DFO's 1–800 Observe, Record and Report (ORR) program. It attempts to provide a positive basis for responding to criticism about individual misbehavior by anglers and about concerns that have been expressed about the implication for conservation of anglers playing "catch and release" in an effort to take home a bigger fish, and guides or resorts selling fishing opportunity on the basis of "guaranteed" full limit catches.

Changing Demographics

There is at least anecdotal evidence that the demographics of the recreational fishery are changing along with changes in the population composition of coastal British Columbia. Newer Canadians may have different tastes in seafood as well as different experiences and attitudes towards the rules that traditionally govern recreational harvesting. There is an obvious need to understand changes in the nature and composition of the recreational fishery and to develop educational programs aimed at the new participants.

[32] http://www.pac.dfo-mpo.gc.ca/recfish/Key%20Points/codeofconduct_e.htm.

First Nations Issues

Allocation Principle 2 as spelled out in the October 1999 policy blue paper says that "After conservation needs are met, First Nations' food, social and ceremonial requirements and treaty obligations to First Nations have first priority in salmon allocation". Representatives of the recreational sector have stated repeatedly their acceptance of Canada's Section 35 constitutional obligations to First Nations.

One contentious issue has been the insistence by First Nations of a requirement that all adjacent recreational fishing for any species of salmon has to be closed before First Nations will accept conservation measures, even on stocks that are not being affected in a material way by the recreational fisheries in question.

Also in the First Nations context is an issue raised prior to the 2005 season when the Nishga-owned Wilp Syoon Wilderness Lodge advertised that customers could keep double the normal coho possession limit. This was possible because the "extra" fish were coho allocated to the Nishga for economic use under their treaty with the Government of Canada. The Department of Fisheries and Oceans had ruled that this exception to the normal possession limits was allowed so long as the client was in possession of a document issued by the Nishga making clear the origin of the fish. This arrangement had the potential to undermine the agreement on "normal limits" that was part of the original allocation understanding between the recreational and commercial sectors.

One other subject that has been raised in the context of the Nishga operation of a fishing resort was whether a First Nation could issue its own fishing licenses and require that these be held by any person fishing in its territory. This question has yet to be answered in a definitive way, but has obvious significance to management and regulation of the recreational fishery as treaty settlement efforts go forward in both coastal and inland areas.

As a final point with respect to the relationship between the recreational sector and First Nations, it should be pointed out that a process was in place for several years in which representatives of the two sectors met periodically to discuss issues of common interest and apparent problems. The participants in this process found that they had more in common than they thought possible at the beginning. In particular, some First Nations spokesmen expressed an interest in participating more fully in the economic side of the recreational fishery, noting that it could provide opportunities for local employment that were no longer offered by commercial fishing or by the forest sector. It also was apparent that up-river recreational interests shared much common ground with local First Nations in terms of ensuring that adequate abundances were allowed to escape past ocean fisheries in order to provide not only for spawning requirements but also for in-river harvest.

It is regrettable that this intersectoral process seems to have fallen into disuse. A less desirable alternative, as demonstrated in the summer of 2005, in the case of access to Fraser sockeye, is for recreational and First Nations representatives to meet in court.

7. CONCLUSION

The recreational fishery for salmon plays an important role in the social and economic life of British Columbia. Without effective conservation, this role cannot be sustained. Although the sector's overall impact on the resource is relatively small, around 3% of the total harvest, its impact on chinook and coho is proportionately much larger and these two species are essential to its viability.

The federal government policy of recreational priority access to chinook and coho ahead of directed commercial fisheries helps to shield the sector from changes in abundance. In effect, it gets to be "last on the water" except when the only available non-retention mortalities on these species are needed by the commercial sector in order to prosecute fisheries on sockeye, pink and chum.

This does not mean that the recreational sector is immune to the need to implement conservation measures when overall abundance declines or when individual stocks need to be protected. Some of the most productive recreational fisheries are concentrated in areas where stocks are mixed. The sector needs to be sensitive to its impact on individual components both in terms of ensuring effective and accurate catch monitoring and by developing appropriate measures to protect weak stocks. Especially in the context of the Wild Salmon Policy and the Species at Risk Act, recreational anglers and their representatives have to help ensure that their impact on the resource is adequately measured and that it is not undermining future expectation and opportunity by an unsustainable impact on any salmon stock.